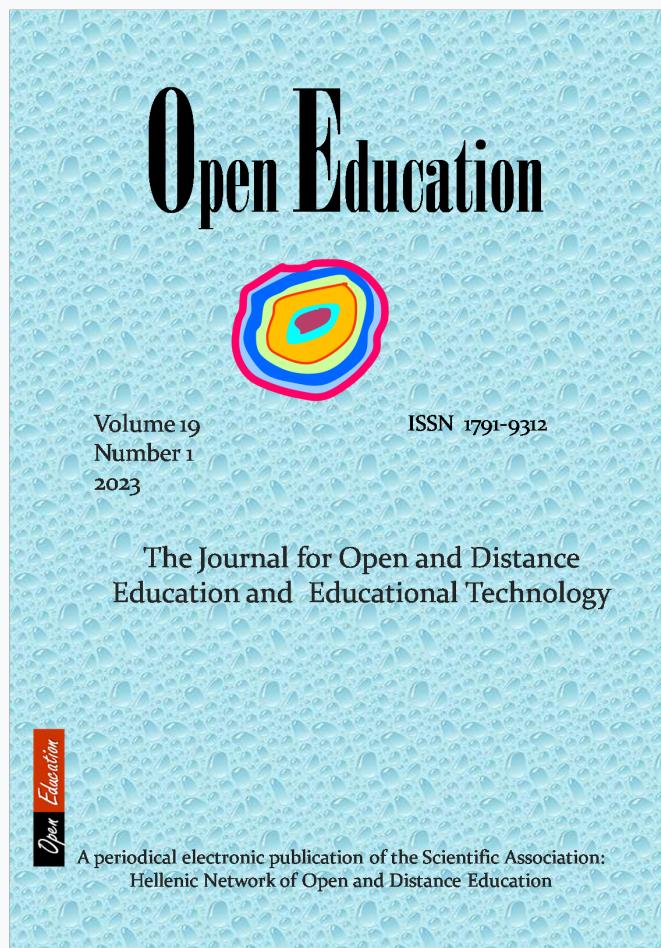


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Adult learners' perceptions about MOOC technologies in Adult Education

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Abstract

The present study attempts to explore the potential for self-regulation within an online educational environment, detecting the characteristics of adult students. At the same time, the effectiveness of the platform OpenedX, which offers Massive Open Online Courses, is being examining, in the above educational framework. Towards this, a research was conducted in which 79 students of the "Informatics" Curriculum of the Hellenic Open University participated and they were invited to attend an online course on this platform. The research questions were examined through the results of two ways of collecting data. Firstly, two close-ended questionnaires and complementary through interviews with 10 of the students were used. The results showed that students' perceptions about the contribution of the xMOOC to the self-regulation were positive. In particular, the answers highlighted the contribution of the e-course in setting personal goals, building an effective learning environment and implementing effective task strategies. In addition, the contribution to the time management, help seeking and self-evaluation were highlighted. At the same time, the participants pointed out suggestions for better use of these courses, in a self-regulated learning context, such as the better use of the forum. Finally, the results of the research highlighted that the platform used is a suitable tool to support these

courses. The participants described the platform as a tool that someone can easily learn how to use and this fact allows the plans for the expansion of this research using the same platform.

Keywords

Adult education, self-regulation, e-learning, MOOC

Introduction

Adult education is a special field of research and study, which concerns adult learners with particular characteristics. Theorists of adult education have expressed these characteristics, highlighting the need of a different approach of education when the learners are adults. Exploring adult learners' characteristics, it can be concluded that is crucial for them to actively participate in the shaping of the educational procedure, in order to adapt it according to their specific features. Towards this, Self-Regulated Learning (SRL) can contribute to this purpose, as a theory which mainly apply to adult education (Armakolas et al., 2015). SRL is the procedure in which learner displays personal initiative, perseverance, and adaptive skill (Zimmerman και Schunk, 2001), so is important to explore if SRL can help adults learners to build a learning path according their particular characteristics.

At the same time, technology has a crucial role in the evolution of education and enhances new flexible ways of education. E-learning courses which offer online education are widespread and host millions of enrolled learners in their platforms. The last form of such courses is Massive Open Online Courses (MOOCs), which are hosted on corresponding platforms. When the scope is to help adult learners to adjust their study to their particular characteristics, MOOCs seem to be an appropriate tool for applying the theory of SRL.

This study presents the perception of adult learners, who enroll and attend two MOOCs, about the contribution of such kind of courses to SRL, aiming to identify if MOOCs contribute to SRL and if a specific MOOC platform is the appropriate tool. The results were collected from two closed-ended questionnaires and interviews. Courses used were developed as xMOOCs, a category of MOOCs, through the OpenedX

platform. These courses use a traditional learning model where the teaching staff is the learning expert who transmits knowledge to learners. In addition, xMOOCs use video lessons and assessment activities (Daradoumis et al., 2013) and support a simple form of asynchronous learning (Spyropoulou et al., 2019).

The next sections of the paper present the theoretical background of this study, the methodology used, the description the results collected and the discussion about the conclusions and the future work.

Theoretical background

Characteristics of adult learners

According to Kokkos (2005), studying the particular characteristics of adult learners has an expected result, the highlight of their educational needs and the highlight of the necessity of getting the educational procedure appropriately organized, in order to be more effective. The educational staff and material have to be adjusted to the particular characteristics of adult learners, in a different way than when they address to different target group. Adult learners have principles and experiences that are well established and if these are ignored, adults have the sense of rejection (Rogers, 1996) or can hinder the adoption of new knowledge (Polson, 1993). Therefore, the techniques used in Adult Education emphasize to the more active participation.

Kokkos (2005) has formulated the five particular characteristics of adult learners as follows:

- they have specific goals
- they have a wide range of experiences that vary
- they have developed the ways of learning that they prefer
- they tend to want active participation
- they face barriers to learning

Self-regulated learning (SRL)

The theoretical approaches to SRL state that the learners regulate their own learning, actively participating in cognitive, metacognitive and behavioral processes (Arnakolas et al., 2015). Giving a definition of SRL, Zimmerman and Schunk (2001) formulate it as

the process of self-guidance, through which learners transform their mental abilities into academic skills related to the specific activities. Zimmerman (1986) also states that learners, in order to be considered self-regulating, must be active participants in their learning process.

Taking into consideration the criteria that describe self-regulating learners, Zimmerman and Schunk (2011) state that self-regulating learners:

- are able to set learning goals
- implement effective learning strategies
- monitor and assess their goal progress
- establish a productive environment for learning
- maintain a sense of self-efficacy
- seek assistance when it is needed
- expend effort and persist, adjust strategies, and set new goals when present ones are attained

Massive open online courses (MOOC)

The term “MOOC” founded from Dave Cormier and Bryan Alexander, when they wanted to describe the open online course coded CCK08 and entitled “Connectivism and Connective Knowledge”, designed by George Siemens and Stephen Downes in 2008 (Downes, 2008). MOOCs are a form of Open Distance Learning and in recent years have been at the center of interest in the field of technology-supported learning (Yousef et al., 2015) and open and distance education (Spyropoulou et al., 2015), as free courses available from anywhere in the world (Liyanagunawardena et al., 2013). As noted by Cooperman (2014), MOOCs are a global movement in the field of technology-supported learning, as a result of the evolution of the Internet as well as the development of software and new technologies. This type of e-learning stems from the openness of educational resources, providing education to hundreds or thousands of learners (Sideris et al., 2015). They are online courses that allow learners to study at their own pace and in their own space (Sideris et al., 2018). Many MOOC providers have emerged over the years, such as the Open edX platforms, Coursera,

Udacity, Khan Academy etc. (Powell and Yuan, 2013) and many higher education institutions have collaborated with them in order to provide their own courses.

Several definitions of the term MOOC have been noted in the literature. A detailed definition noted by OpenupEd, one of the world's largest providers of MOOCs for higher education, in a European project involving many European partners. The definition states that "*MOOCs are online courses designed for a large number of participants and can be accessible to anyone from anywhere as long as they have an internet connection, are open to anyone without introductory prerequisites and offer a complete online experience for free.*" (Jansen et al., 2015, p. 11). During the evolution of MOOCs some models of such courses emerged, which Siemens (2013) divided into xMOOC, cMOOC and quasi-MOOC. As analyzed in the study of Daradoumis et al. (2013), xMOOCs replicate online the traditional training model, where the educator is the expert and learners are the consumers of knowledge and saved video tutorials and assessment activities are used. On the other hand, cMOOCs are based on a connectivist pedagogical model, which considers knowledge as a part of knowledge networks and learning as the process of generating these networks, using online and social tools. Lastly, quasi-MOOCs contain many online textbooks as open educational resources, which are technically not courses but are able to support learning-specific tasks and consist of asynchronous learning resources that do not provide the social interaction of cMOOC or the automated assessment and tutorial-driven format of xMOOC.

Scope of this study

Reviewing the literature, some studies present that learners who were not able to self-regulate were not successful in their study (Chen, 2009). According the particular characteristics of adult learners, above, this fact seems to make sense considering that if adult learners are not able to adapt their study to their particular characteristics, they may not successfully complete their education. Towards this, study designed a research about the views of adult learners on the means that will facilitate the implementation of SRL, when they attend a course. In particular, the main purpose of the study is to investigate if MOOCs, which offer freedom of time, space and pace of study, contribute to self-regulation of learners with the characteristics of adult. The

application of self-regulation has been investigated in e-classrooms, such as in Moodle platform, but for this study it is crucial to extend the research to new e-learning technologies, such as MOOCs.

At related studies, there are positive estimations about the contribution of e-classes to the development of the characteristics of SRL in learners (Vovides et al., 2007). At the same time, it is stated (Chen, 2009) that SRL is a learning strategy based on the individual goals set by learners, in order to increase their learning performance. Based on the above, the research this study organized is based on a modern form of online education, in order to detect the views of adult learners on its contribution to their self-regulation. The tool this study used is MOOCs; in particular two xMOOCs.

After completing this research, the data collected present the perspective of adult learners regarding the application of SRL theory in xMOOC. In particular, adult learners which are students at the Hellenic Open University expressed their opinions about their self regulation during the attendance of a MOOC. Moreover, the study explores their perceptions about MOOCs as an online tool of learning.

Methodology

The technology used in this study is MOOCs, which are worldwide widespread in recent years and offer a flexible way of studying, where learners can choose the time and pace of their study, as well as their learning path that will follow (Sideris et al., 2018). Such a form of learning seems particularly useful in today's social conditions, especially for adult learners. Millions registrations are internationally observed in world-renowned MOOC delivery platforms, but also in national ones, such as some MOOC platforms developed in Greece. At the same time, the theory of SRL can contribute to make the study in a MOOC more effective. Towards this, it is important to explore the application of SRL in a MOOC.

Aiming to design a research methodology in order to achieve the above objective, the study sets and explores two research questions:

Research question 1:

Can an e-course, developed as an xMOOC, contribute to self-regulated learning?

Research question 2:

Can the OpenedX platform effectively contribute to the creation of e-courses, in terms of the criteria of learning, ease of use, efficiency and utilization of the tool?

For the exploration of the first research question, a closed-ended questionnaire of twenty-four (24) questions and interviews were used. Accordingly, for the second research question a closed-ended questionnaire of fifteen (15) questions and interviews were used. The quantitative and qualitative data collected were analyzed to investigate the research questions.

The study used a methodology of collecting qualitative and quantitative data, implementing the Convergent Mixed Methods Design (Cresswell, 2012). In addition, the triangulation method used, collecting data through close-ended questionnaires and interviews, in order to study the research questions through different perspectives (Olsen, 2004). The closed-ended questionnaires used are based on research questionnaires used in related studies, adapted to the needs of this study. In particular, the first questionnaire, which refers to the possibility of self-regulation, developed as the translation of the Online Self-Regulated Learning Questionnaire (OSLQ) developed by Barnard et al. (2009). The second questionnaire, which refers to the evaluation of the online tool used, is based on the one proposed by Ziogou and Dimitriadis (2010) for the evaluation of an educational tool and it was appropriately modified to serve the needs of this study. In addition, for the research questions, semi-structured interviews were conducted, which consist of questions that need to be answered, but there is ease for the researcher to pose the questions in any order and to go deeper depending on the answers given by the participant (Harrell and Bradley, 2009). As the questionnaires used are based on those of other researchers after their appropriate modification, it was necessary to evaluate them in terms of their internal reliability. For this purpose, the Cronbach's alpha index (1951) was calculated for the two questionnaires. For the first questionnaire of twenty-four (24) questions this index was 0.881 and for the second questionnaire of fifteen (15) questions was 0.933. According to George and Mallery (2003) these indexes are considered as *good* and *extremely good* respectively.

The participants of the research were students from the first year of study at the Hellenic Open University who attend undergraduate program "Informatics". Out of a total of 245 first year students, 79 participated in the research. Before their

participation in the research, they attend two MOOCs, which are used as preliminary courses in their undergraduate program. MOOCs remained open for enrollment and attendance for three months. During this period, students could study the educational content and fill the closed-ended questionnaires of the research at the end of their study. Questionnaires were provided to participants through the MOOC platform and using the Google forms tool. Completing the study of the course, students were able to participate in the research interviews. At the end of the research procedure, 79 students answered the closed-ended questionnaires and 10 students participated in interviews, choosing either the Skype tool or the communication via their mobile phone.

Results

The present study sets and explores two research questions. The first research question refers to the contribution e-courses, developed as xMOOCs, to self-regulated learning. For this research question the OSLQ used and participants were asked to use a likert scale from 1 to 5, where 1 meant Definitely no and 5 meant Definitely yes. The results are presented in the Table 1.

Table 1: Participants' answers for their self-regulation during the study of MOOC

		1	2	3	4	5
Goal setting	I set standards for my learning.	0%	1%	10%	49%	39%
	I set short-term (daily or weekly) goals as well as long-term goals (monthly).	0%	1%	13%	43%	43%
	I keep a high standard for my learning.	0%	3%	16%	43%	38%
	I set goals to help me manage study time.	0%	3%	16%	41%	41%
	I do not compromise the quality of my work because it is online.	1%	3%	22%	35%	39%
Environment structuring	I choose the location where I study to avoid too much distraction.	1%	0%	3%	33%	63%
	I find a comfortable place to study.	0%	1%	4%	38%	57%
	I know where I can study most efficiently.	0%	1%	5%	47%	47%
	I choose a time with few distractions for studying.	0%	3%	6%	44%	47%
Task strategies	I try to take more thorough notes for my online courses because notes are even more important for learning online than in a regular classroom.	4%	8%	30%	29%	29%

	I read aloud instructional materials posted online to fight against distractions.	18%	28%	23%	19%	13%
	I prepare my questions before joining in discussion forum.	10%	11%	32%	24%	23%
	I work extra problems in my online courses in addition to the assigned ones to master the course content.	4%	10%	20%	37%	29%
Time management	I allocate extra studying time for my online courses because I know it is timedemanding.	9%	6%	39%	35%	10%
	I try to schedule the same time every day or every week to study for my online courses, and I observe the schedule.	5%	13%	37%	38%	8%
	Although I do not have to attend daily classes, I still try to distribute my studying time evenly across days.	4%	10%	27%	44%	15%
Help seeking	I find someone who is knowledgeable in course content so that I can consult with him or her when I need help.	15%	24%	27%	25%	9%
	I share my problems with my classmates online, so we know what we are struggling with and how to solve our problems.	9%	18%	23%	28%	23%
	If needed, I try to meet my classmates face-to-face.	28%	15%	29%	23%	5%
	I am persistent in getting help from the instructor through e-mail.	5%	10%	27%	24%	34%
Self evaluation	I summarize my learning in online courses to examine my understanding of what I have learned.	3%	4%	22%	41%	32%
	I ask myself a lot of questions about the course material when studying for an online course	1%	10%	23%	35%	30%
	I communicate with my classmates to find out how I am doing in my online classes.	24%	37%	25%	11%	3%
	I communicate with my classmates to find out what I am learning that is different from what they are learning	22%	30%	24%	15%	9%

Exploring the first research question, the results of the interviews conducted in the context of this study are presented below. Each participant answered three (3) questions, describing his opinions based on the experience of participating in the online course. These questions were based on the definition of Self regulation formulated by Zimmerman and Schunk (2011, p. 1), which was given to the participants. Specifically, the following paragraph was presented:

"Self-regulated learners are able to:

- *set learning goals*
- *implement effective learning strategies*
- *monitor the progress of their goals and evaluate it*
- *establish a productive environment for learning*
- *maintain a sense of self-efficacy for learning*
- *seek help after personal feedback of the above processes, when they need it*
- *persist and adapt learning strategies to achieve their goals"*

Subsequently, next figures present participants' answers grouped for each of three questions. In the first question of the interview, participants were asked to answer the following question:

"Do you think that the platform you used for studying the educational material of the e-course supports the self-regulation of your learning? Justify your answer."

The answers show that the great majority of the respondents answered made positive comments about the support of their self-regulation. Specifically, nine out of ten respondents reported positively (Figure 1), while one of the respondents noted that the platform did not contribute to his self-regulation. Additional findings from the first question are the respondents' reference to the platform's contribution to set the learning objectives, to control the user's progress through the exercises included in the course and to seek help from other participants. Moreover, there were reports of the platform's contribution to the search for other resources outside the course, the ability to study from a mobile device, while most reports highlighted platform's contribution to the personal study pace for each user.

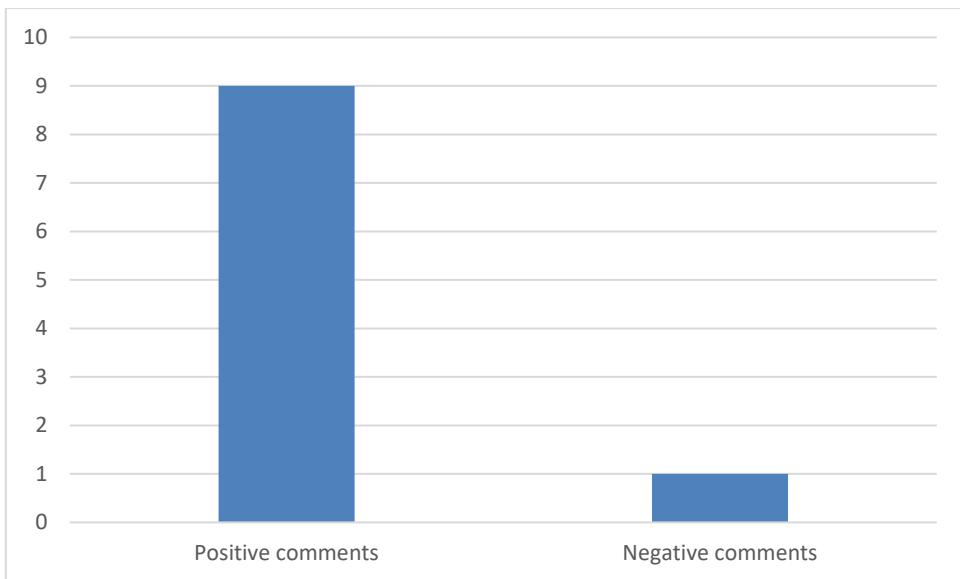


Figure 1: First question: "Do you think that the platform you used for studying the educational material of the e-course supports the self-regulation of your learning? Justify your answer."

In the second question of the interview, participants were asked to answer the following question:

"What tools or practices used in the platform supported the self-regulation of your learning? Justify your answer."

The answers (Figure 2) show that most of the respondents referred to the help offered by the structure of the course they attended. Most of them also highlighted the control of their progress, which was recorded by their answers to the exercises. In addition, half of the respondents noted the importance of using the course forum as well as the video training material of the course. Moreover, the feedback given through the exercises of the course when they were completed, as well as the reminder to the user of his last point of study in the course before his last login were mentioned as practices that contributed to the self-regulation of the participants. Finally, quizzes and presentations are less frequently mentioned as tools that contribute to self-regulation, while the opportunity to try again after a wrong answer, the time limits that are set, the existence of a goal in the course and the help to refer to other knowledge outside of educational material are mentioned as practices that contribute to self-regulation.

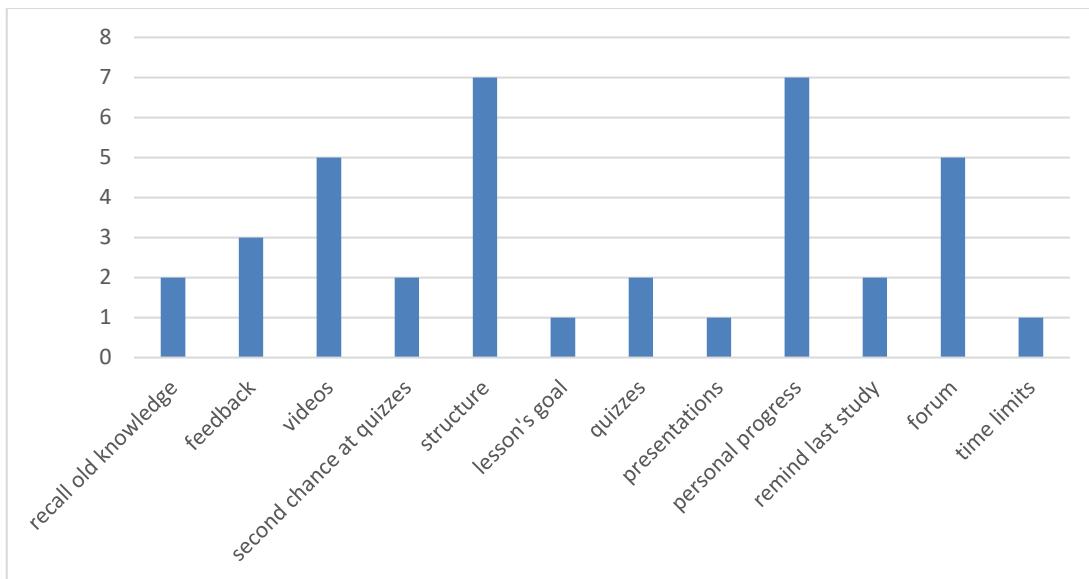


Figure 2: Second question: “What tools or practices used in the platform supported the self-regulation of your learning? Justify your answer.”

In the third question of the interview, participants were asked to answer the following question:

“In which way the educational platform could be used in order to support your learning better? Justify your answer.”

The answers show that most of the responses for better use of the platform referred to issues related to the course forum (Figure 3). In addition, a significant number of responses referred to the need for more video training material or improvements to existing videos, as well as adding subtitles to existing videos. Moreover, the participants' suggestions for better use of the platform related to more additional literature in the form of sources related to the subject of the course, to better adapt the appearance of the platform to mobile devices, and to better inform about the prerequisite knowledge of the course. The suggestions with fewer mentions were the addition of more interactive educational material and advanced exercises as projects, the presentation of detailed steps for solving the exercises as feedback, the better matching of the exercises with the educational material and the addition of exercises between texts, videos and presentations except at the end of a unit. Finally, there were suggestions for improvements in the feedback, which should be present in more exercises, in the information about the number of attempts in the exercises of the

course, in the e-mail update for each new comment in the forum, in the addition of bibliography per chapter of the course and in the formulation of the objectives.

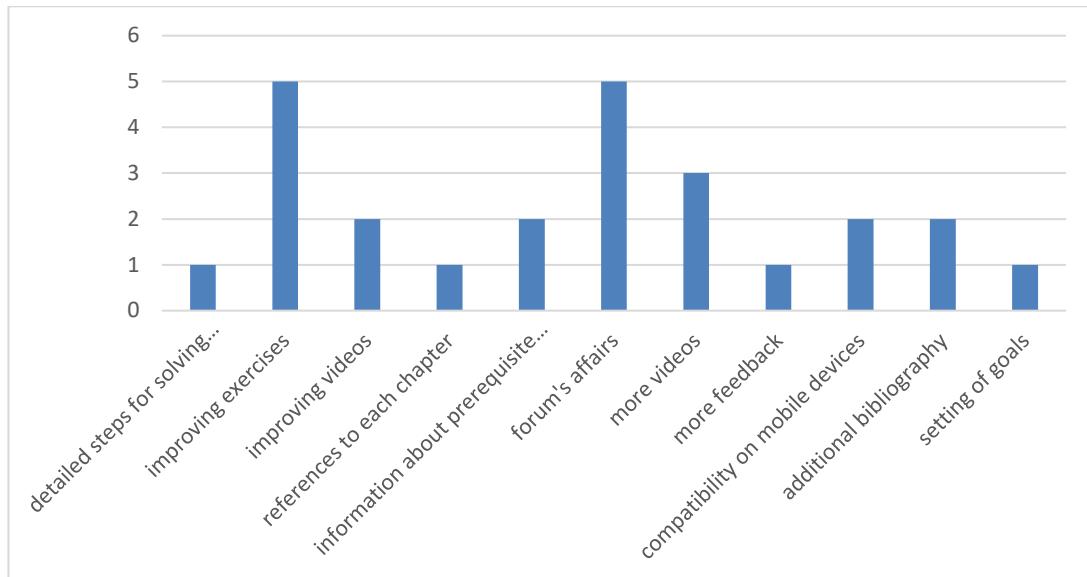


Figure 3: Second question: "In which way the educational platform could be used in order to support your learning better? Justify your answer."

Continuing the analysis of the results, in order to explore the second research question the responses of the learners to a questionnaire of fifteen (15) close-ended questions are presented. The questionnaire is related to the suitability of an xMOOC as a tool for providing online courses, it is based on the one proposed by Ziogou and Dimitriadis (2010) and it was modified appropriately for the needs of the present study. Participants were asked to use a likert scale from 1 to 5 (1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree).

The questionnaire is divided into four (4) axes:

- learning
- ease of use
- efficiency
- utilization

The answers to the questions are described in the Table 2, grouped by each axis of the questionnaire.

Table 2: Participants' answers for their self-regulation during the study of MOOC

		1	2	3	4	5
Learning	Learning to operate the platform was easy.	0%	4%	0%	20%	76%
	As a new user, I did not need much support to use the platform.	0%	3%	1%	18%	78%
Ease of use	I could relatively easily grasp the available options of the environment.	1%	3%	1%	28%	67%
	The environment is pleasant to use.	1%	4%	5%	32%	58%
	I could easily navigate the platform.	1%	4%	0%	24%	71%
Efficiency	I am generally satisfied with the ease of use of this platform.	0%	5%	6%	34%	54%
	The environment adequately enables me to know in which area I am.	1%	3%	4%	41%	52%
	The structure of the information and navigation was in overall appropriate and understandable.	3%	3%	10%	34%	51%
	The platform efficiently organizes the discussion.	8%	9%	32%	28%	24%
	The platform encouraged me to actively participate in group discussions (forums).	11%	13%	35%	18%	23%
Utilization	The use of the platform reinforced the concept of teamwork and helped team collaboration.	10%	18%	39%	18%	15%
	The platform helped me save time for my cooperation with the rest of the team.	11%	14%	39%	18%	18%
	My experience from the platform will help me to implement tasks related to online courses.	4%	5%	23%	33%	35%
	The fact that I could see my fellow students' posts on the forum helped me, because it gave me stimuli for new ideas in my learning.	10%	15%	19%	28%	28%
	The ability of the platform to keep a history of actions and save the last spot I visited on the platform, I think it helped me and gave me confidence and security.	3%	3%	11%	34%	49%

In order to better investigate the research question, additional interviews were conducted with the participation of some participants. So continuing the investigation of the second research question, the results of the interviews conducted are presented below. Participants answered to one (1) question, which was divided into four (4) axes, freely describing their opinions based on the experience of participating in the online course.

The question participants answered was:

“To what extent do you consider that the platform you used contributes to the following criteria of the tool:

- *learning*
- *ease of use*
- *efficiency*
- *utilization*”

The responses for each axis of the question are presented below.

Axis “learning”

Studying the responses, it appears that all of them were positive (Figure 4). Despite the fact that few of the participants had previous experience of using an e-learning platform, all of them stated that they did not face any problem in learning the tool. In addition, respondents made specific mentions of the ease of learning how to use the menu navigation, course structure, use of the forum and bibliography as well as the use of the user's individual progress tracker.

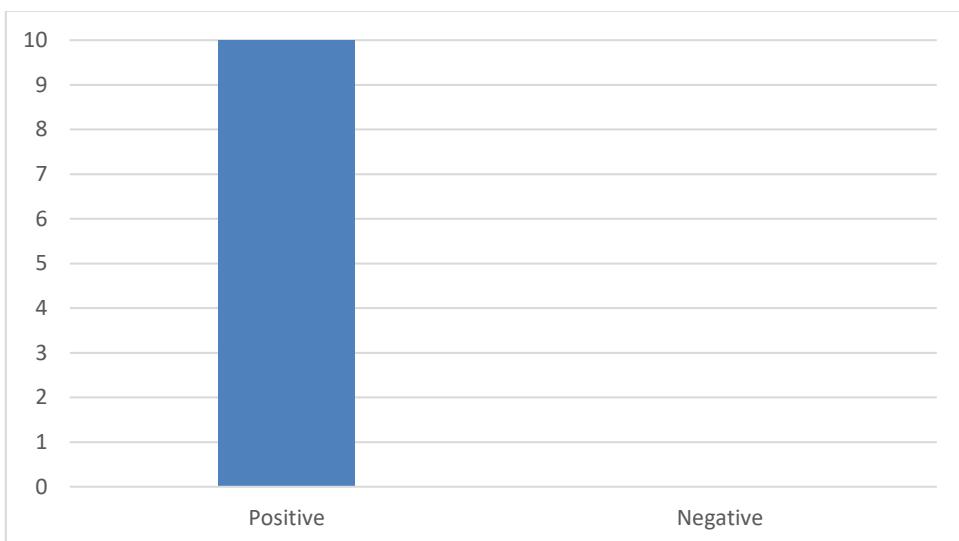


Figure 2: Learning the tool

Axis "ease of use"

In this axis the answers present same results with the previous axis. All participants answered that they have a positive opinion about the usability of the platform they used (Figure 5). In addition, special mentions are made of the ease of use of the tool in terms of structure, navigation and the individual progress tracking tool.

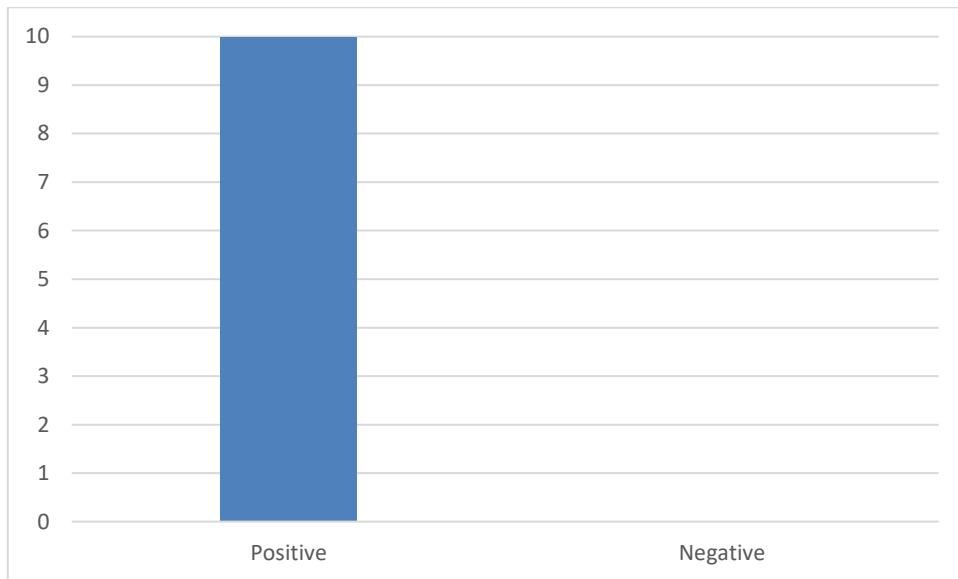


Figure 3: Ease of use of the tool

Axis "efficiency"

The responses for this axis are mostly positive regarding the efficiency of the tool they used, while there was a neutral response and one respondent who did not comment on the efficiency (Figure 6). Special mentions of efficiency were made for the reminder of the user's last navigation and the use of external additional sources. In addition, the addition of objectives and prerequisites and the improvement of certain exercises were mentioned as an element of efficiency improvement.

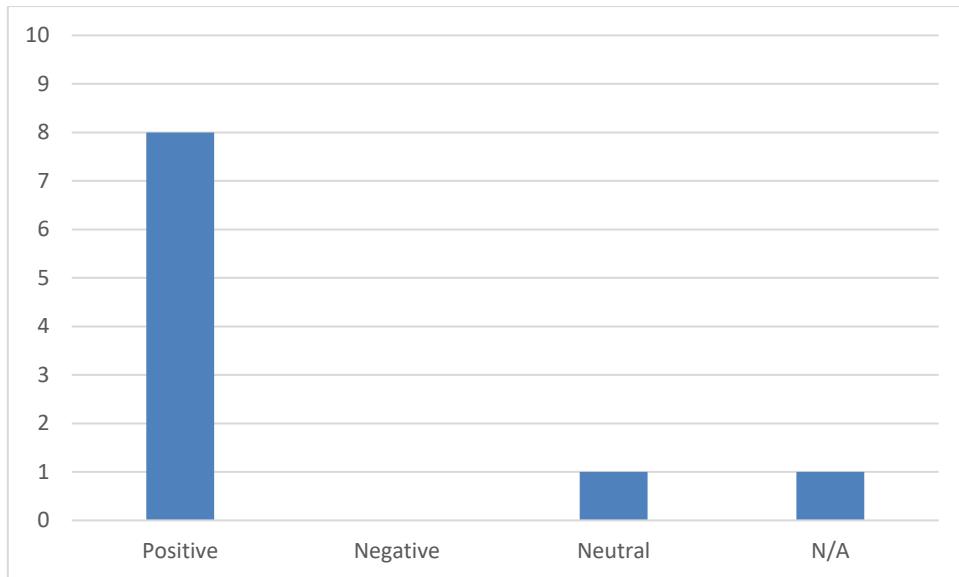


Figure 4: Tool efficiency

Axis "utilization"

Regarding this axis, the responses are mainly positive, too (Figure 7). Although two neutral options were also expressed, while three respondents did not make any comment on the utilization of the tool. Some special mentions made for this axis were about the structure of the course, the reminder of the last visit to the platform and the proper use of the forum. In addition, there were specific references to the correct use of the exercises and their feedback, where there were room for improvement in terms of solution instructions and feedback.

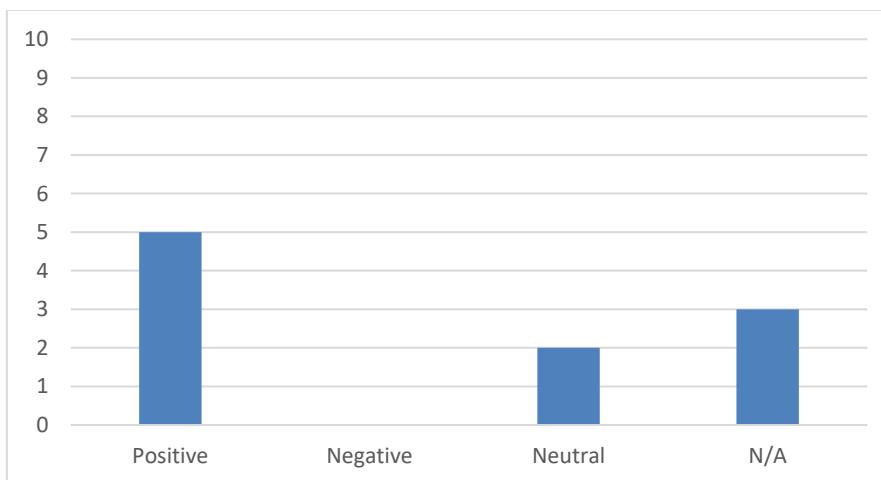


Figure 5: Tool utilization

Discussion and future work

The aim of this study was to investigate students' perceptions regarding the potential of MOOCs to contribute to the theory of SRL. Additionally, the students' opinion about the MOOC platform OpenedX, as an e-learning tool, was examined. Towards this, the study of the results presented in the previous chapters came to some conclusions, which enlighten the research questions.

For the first research question, the study showed that an e-course can contribute to the learners' self-regulation, confirming the assessment of Vovides et al. (2007), especially an xMOOC, the most modern form of education encountered nowadays. Participants' responses also highlighted the capability for self-regulation they encountered while attending the xMOOC. In addition, according to the respondents the most important contribution of the platform was setting the time and pace of study. This seems very important since good time management leads to successful completion of a MOOC, as Kizilcec et al. (2017) noted. Moreover, observing the particular characteristics of adult learners it is obvious that setting the pace of study is very important for adults and this fact shows the great contribution that an xMOOC can have to them.

At the same time, the determination of study time, which was individual for each learner, affected the course activities that required discussion among users. The respondents highlighted this fact when they asked to comment the use of forums, where many opinions expressed a neutral attitude towards the operation of the discussion area. This seems to be justified by the fact that the personal goals and personal pace of study of each learner do not keep pace with the rest of the users. As Chen (2009) mentions, SRL is related to the way the learner sets goals and promotes individual achievement. Therefore, a tool that contributes to the regulation of individual study appears to influence user collaboration. Nevertheless, the participants noted that the discussion area helped them to a certain extent, but they also proposed a better utilization.

For the second research question, the results of the study showed that OpenedX platform can effectively contribute to the development of e-courses. Respondents expressed a very positive view of the ease of use of the platform, which required very little time to learn how to use it. The tools and practices used by this platform also had

a positive impact on the learners' study. Learners highlighted the videos, the immediate response and feedback exercises and the reminder of the last point they visited on their previous visit to the platform as the main helpful tools. In addition, the responses revealed that there was no significant difference whether someone had experience with a respective platform or not, which highlights the effectiveness of the platform even when it addressed to novice users of online education platforms.

In conclusion, the study shows xMOOC-type e-courses have the potential to contribute to learners' self-regulation and to adult education. Moreover, the study shows that OpenedX platform is able to support such e-courses offering efficient tools and options for an individual study, aiming the effective education of adult learners.

A proposal for the improvement of the development of an xMOOC on the OpenedX platform is to set auxiliary teaching staff with the role of mentor for the course forum. This proposal derives from a related work by Leon Urrutia et al. (2015) and it seems that it can help to improve the use of the forum of such a course, so that learners have more opportunity to exchange ideas and experiences. Since this study shows that the help of the fellow students is important, but the utilization of the forum could be improved, it seems that the inclusion of a mentor or mentors can contribute to learners' self-regulation and performance.

As a future direction and continuation of the research, the study can also explore the respondents' views basing on their previous experience or not on online learning platforms, identifying if the previous experience affects their views.

Finally, the research presented in this study can be carried out using online courses of various subjects. It would be interesting to explore whether the subject of the course influences the views of adult learners on their self-regulation and on the use of the OpenedX platform. Practices and tools used in different subjects may be applied differently. Such a study could compare its results with those of the present study, in order to establish whether or not the conclusions are identical.

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