

Students' Approaches to Massive Open Online Courses: The Case of Khan Academy

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Abstract

The work on Massive Open Online Courses (MOOCs), which has become popular, continues to grow since the date it has entered the literature, and academicians are rapidly adopting and using it. Even though most of the academics accepted and started using MOOC environments, for some it has still not been efficient enough. Academics who think that the environment still needs to be developed are working on changes to increase the effectiveness. This is a qualitative and quantitative study in which the Technology Acceptance Model (TAM) is used. The aim of this study is to evaluate the views of students who watched the videos of the Khan Academy in the MOOC environment according to the dimensions of Perceived Usefulness (PU), Perceived Ease Of Use (PEOU), Learning Strategies and Cognitive Appraisal. The results obtained from the study are aimed to help the researchers who want to work with Massive Open Online Courses and develop the MOOC.

Keywords: Distance Education; Online Learning; Adult; Lifelong Learning; Moocs; Online Platforms; Education Technologies; Online Materials.

1. Introduction

Even though the existence of Massive Open Online Courses (MOOCs), which have become famous in the areas of information technology and distance education since 2011, has been accepted, the researches and changes regarding its development still continue. (Fan & Yu, 2017). The Massive Open Online Courses used by hundreds of universities include thousands of courses creating the opportunities for learners of all ages to develop themselves (Tang, 2017). MOOCs which provide life long personal development to learners, opportunities to those teachers who would like to share their knowledge worldwide by providing online education and earning Money by doing so.

Massive Open Online Courses are divided into 3 as; Connectivist MOOCs (cMOOC), Expanded/Extension MOOCs (xMOOC) ve Hybrid MOOCs (hMOOC) (Lugton, 2012). Firstly, in 2008, Massive Open Online Courses (Kop & Hill, 2008), which emerged in the direction of the connectivism theory, later made a remarkable mention of xMOOCs in 2011 with the university model learning approach (Fidalgo-Blanco, Sein-Echaluce & Garcia-Peñalvo, 2016). The year 2012 was chosen by the New York Times as "The Year of the MOOC" (Lewin, 2014). MOOCs

continued this rise in the following years, and by 2017, it became an environment in which more than 6,000 students were enrolled, used by more than 58 million students and 700 universities (Chaffey, 2017; Hone & El Said, 2016). The Word “massive “ used in the Massive Open Online Courses refers to unlimited number of students, courses, the content of the courses and the materials used. Openness means that access to courses is open to everyone, and MOOCs will provide the opportunity of lifelong learning to anyone who wants to learn. The online word expresses that MOOCs are prepared using online materials in the online environment, while Course word indicates that online education is started and finished within a certain pedagogy and within a certain period of time (Israel, 2015). Among the features that distinguish MOOCs from other courses are teaching materials (Kennedy, 2014). The duration of the videos has been shortened considerably by the beginning of the use of MOOCs and is being prepared to dispel the attention of the learners.

In addition, MOOC environments allow the learner to repeat the topic taught in applied lessons, enabling the learning to take place more effectively. Another feature of MOOCs is that it is open to everyone who wants to learn. Except for some of the courses provided by universities, it is possible to access many courses for free. Universities such as Stanford University, MIT, University of Pennsylvania, University of Michigan and Harvard University are the universities that most use the MOOC. Some of the most used MOOC environments that these universities are using are Coursera, edX, Code Academy, Udemy, Udacity and Khan Academy environments. Although the official language of Khan Academy is English, it has been chosen because it is supported with subtitles of about 20,000 different languages. The main language of the students who will participate in the study is Turkish. The purpose of this study is to determine the views of students regarding the environment and courses by evaluating the Khan Academy MOOC medium, which has a high number of courses and users. This study, which will be carried out using the Technology Acceptance Model (TAM) model, also specifies the evaluation results of students' MOOC environment, course and course materials from Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Learning Strategies and Cognitive Appraisal: Threat versus Challenge.

2. Theoretical Background

Khan Academy

Khan Academy is a non-profit online learning environment founded in 2006 by Salman Khan by the slogan "Free, World-class education for anyone, anywhere". In the Khan Academy MOOC environment it is possible to find courses in many different branches (Thompson, 2011). These courses include videotapes, written resources, and interactive learning environments (Morrison & Di Salvo, 2014). Spanish, Portuguese, French and Bengali languages support the platform, although the native language used by Khan Academy is English. In addition to these languages, around 20,000 subtitle supports are featured on the videos of Khan Academy (Dijksman & Khan, 2011). Along with this, the Khan Academy now publishes 36 training courses rather than English (Sampson, Ifenthaler, Isaias & Spector, 2014). The fact that the students who participate in the study have Turkish as their mother tongue and that there are many videos in Turkish language or Turkish subtitles on the Khan Academy platform is the main reason for selecting the Khan Academy MOOC platform.

Technology Acceptance Model (TAM)

The Technology Acceptance Model was developed by Davis (1989) to work on his dissertation in 1986. TAM is a model that supports the acceptance of new technology from the user depending on the variables of; (1) Perceived Usefulness and (2) Perceived Ease Of Use (Venkatesh & Davis, 2000). The Technology Acceptance Model argues that the success rate in information systems depends, not only on the technical and managerial characteristics of the user, but also on the personal characteristics, expectations and perceptions of system users (Holden & Karsh, 2010). The idea that the user perception in a variety of subjects could affect this success was also put forward. Perceived Usefulness (PU) approach is that the person's expectancy leads to increases in

personal life and business performance. In Perceived Ease Of Use (PEOU) approach, the person expects a convenience that technology can provide (Cheung & Vogel, 2013).

Learning Strategies

Students with very different characteristics are learning in the learning environments. These characteristics that students bring to classrooms affect learning strategies (Schmeck, 2013). Learners have different learning habits, strategies, different levels of knowledge or skill, different levels of motivation, and different personality traits (Gurpinar, Kulac, Tetik, Akdogan & Mamakli, 2013). A teacher who is aware of these situations can help learners learn more effectively by differentiating teaching according to their learning characteristics using different materials (Entwistle & Ramsden, 2015). The learning approach concept, which is regarded as a variant of individual differences among learners, has been demonstrated by Marton and Saljo, who have studied how learners perceive a particular reading part and how they engage in learning (Marton & Saljo, 1976a; Marton & Saljo, 1976b; Islam & Shafiq, 2016). Studies in this area have shown that students use different learning approaches when performing a learning task.

The concept of learning approaches treats individuals in two different areas as Deep Learners and Surface Learners (Platow, Mavor & Grace, 2013). The deep approach aims to develop skills in specific academic subjects. (LeCun, Bengio & Hinton, 2015). This approach includes reading strategies, learning to relate to old and new information, and learning to make sense (Riding & Rayner, 2013).

Cognitive appraisal: Threat versus challenge

Stress is a word we use quite often in our daily lives. Stress is used for people who are under pressure, suffer from difficulties, and is a psychological condition (Nuri & Uzunboylu, 2017; Terzi, 2009). Stress is one of the most overworked subjects due to its short and long-term negative effects on the physical, intellectual and emotional meaning left on the human depending on its intensity or the way the living person perceives the intensity. However, today, the concept of stress can be used in more than one sense. The Cognitive appraisal consists of two evaluations which are; primary appraisal and secondary appraisal. In the primary evaluation part, the person assesses what the situation means for them. In this section, a stressful situation can be evaluated in the form of damage, loss, danger and challenge (Nuri, Demirok & Direktor, 2017; Dewe and Alvin, 1999; Gardner and Fletcher, 2006). In the event of a loss or damage assessment the person is faced with damage or loss. In the evaluation of the challenge, there is expectation of overcoming, gain and development (Wrzesniewski and Włodarczyk, 2001). Individuals who are subjected to a danger assessment experience negative feelings such as anger, fear or resentment, while individuals who evaluate stress as a challenge live positive emotions such as excitement and enthusiasm (Folkman, 1984). Secondary evaluation is the process that evaluates the potential sources of what the individual can do about the threat they perceive (Carver, Scheir ve Weintraum, 1989). In the secondary evaluation part, the person looks at what needs to be done in order to minimize the loss or make benefit.

3. Methodology

Data Collection

This study was conducted at a private university in Cyprus during the fall semester of the 2017-2018 academic year. The sample of the study consists of 51 teacher candidates, 19 females and 32 males. The courses on the Khan Academy platform are xMOOC type courses. Teacher candidates have completed the course during the fall semester by registering to a course of their wish on the Khan Academy platform during the fall semester. At the end of the semester, the researchers collected data from the teacher candidates who completed the courses. The study was carried out as a qualitative and quantitative study. While the questions constituting the qualitative part of the study were prepared by the researcher, the quantitative part presented ready scales to the students.

4. Instruments and Data Analysis

Qualitative Research

In the qualitative part of the study, the interview form was used to obtain student opinions. The data obtained from the interview form was analyzed and interpreted by descriptive analysis (Altunışık et al., 2010) using the NVivo program. The questions prepared by the researcher to obtain the qualitative data of the work are as follows:

- What is your opinion about the course platform? Discuss pluses and minuses.
- What is your opinion about your learning process? Discuss pluses and minuses.
- What is your opinion about the content of the course and the way it is being taught? Discuss pluses and minuses.

Quantitative Research

We used five questionnaires to gather the following data: personal details, cognitive appraisal, learning strategies, and two MOOC attitude questionnaires. The personal details questionnaire had two statements: gender and age. The data obtained from the qualitative dimension of the study were analyzed using the Descriptive Statistics and Pearson Correlation Coefficient analysis methods using the SPSS program.

The cognitive appraisal questionnaire measured students' feelings of threat versus challenge when confronted with new situations. It consisted of 9 statements rated on a 5-point Likert scale (1=strongest disagreement; 5 = strongest agreement). This questionnaire was previously used (Aharony, 2009; Yekutieli, 1990) and consisted of two factors: threat (items 1, 2, 3, 4, 6, 7) and challenge (items 5, 8, 9). Cronbach's Alpha was .91 for the threat factor and .74 for the challenge factor.

The learning strategies questionnaire consisted of 14 statements rated on a 5-point Likert scale (1=strongest disagreement; 5= strongest agreement). This questionnaire, which was also previously validated (Aharony, 2009; Aharony, 2014), consists of two factors: deep and surface learning strategies, with seven items for deep learning (items 1, 3, 6, 8, 9, 12, 13); and seven for surface learning (items 2, 4, 5, 7, 10, 11, 14). Cronbach's Alpha coefficients were .78 and .71, respectively.

The first attitude questionnaire addressed MOOCs' perceived usefulness (PU) and was based on Liu, Li, and Carlsson (2010). It was modified for this study and consisted of three statements rated on a 5-point Likert scale (1=strongest disagreement; 5= strongest agreement). The value of Cronbach's Alpha was .83.

The second attitude questionnaire examined MOOCs' perceived ease of use (PEOU) and was also based on Liu, Li, and Carlsson (2010). It was modified for this study and consisted of three statements rated on a 5-point Likert scale (1=strongest disagreement; 5= strongest agreement). The value of Cronbach's Alpha was .82. The questionnaires appear in the Appendix.

5. Results

Quantitative Results

51 students, 32 males (62.7%) and 19 females (37.3%) participated in the study. Threat and Challenge averages are given below in the Technology Acceptance Model dimension, Perceived Usefulness (PEOU), Learning Strategies dimension, Deep Learning and Surface Learning, and Cognitive Appraisal dimension of the students participating in the study.

Table 1. TAM, Learning Strategies and Cognitive Appraisal, Means (\bar{X}) and Standart Deviations

PU		PEOU		Deep Learning		Surface Learning		Threat		Challenge	
Mean (\bar{X})	SD	Mean (\bar{X})	SD	Mean (\bar{X})	SD	Mean (\bar{X})	SD	Mean (\bar{X})	SD	Mean (\bar{X})	SD
4.57	0.41	4.22	.53	3.16	.40	3.11	.51	2.09	.66	3.89	.54

As seen in Table 1, the TOT values of students (PU and PEOU) are high PU ($\bar{X}=4.57$), PEOU ($\bar{X}=4.22$). According to these results, it is possible to say that the students think that Khan Academy MOOC environment is both easy to use and beneficial to their personal lives. As a result of the analysis, when we look at their learning strategies. We can say that students are almost equal with Deep Learner ($\bar{X}=3.16$) and Surface Learner ($\bar{X}=3.11$). When we look at the cognitive evaluation dimension, we see that the students' have a higher feeling of challenge for the lessons they take ($\bar{X}=3.89$). Whereas they have little fear of the Khan Academy MOOC environment. (Threat $\bar{X}=2.09$).

The following table shows the relationships between the TAM, Learning Strategies and Cognitive Appraisal variables (r) and the coefficient of determination between the variables with strong relationships amongst them. Since the relationship between the variables with no significant difference ($p > 0.05$) was not interpreted, the coefficient of determination between these variables was not considered (Büyüköztürk, 2017).

Table 2. Pearson correlations between PU, PEOU, learning strategies and cognitive appraisal

Measures	PU	PEOU	Deep Learning	Surface Learning	Threat
PU					
PEOU	$r = -0.51$				
Deep Learning	$r = -.088$	$r = .069$			
Surface Learning	$r = .062$	$r = .057$	$r = .034$		
Threat	$r = -.374^{**}$ $r^2 = .14$	$r = .510^{**}$ $r^2 = .26$	$r = -.218$	$r = .146$	
Challenge	$r = .606^{**}$ $r^2 = .37$	$r = -.175$	$r = -.364$	$r = .369^{**}$ $r^2 = .14$	$r = -.198$

As seen in Table 2, there is a relationship between Perceived Usefulness and Cognitive Appraisal variables. There was an inverse relationship between PU and Threat, and the PU variable was found to affect the threat variable by 14%. ($r = -.374$, $r^2 = .14$). It was found that there was a straight relationship between PU and Challenge and that they affected each other by 37%. ($r = .606$, $r^2 = .37$). It was found that the relationship between PEOU and threat was a linear relationship and that PEOU affected the threat variable by 26%. ($r = .510$, $r^2 = .26$). The other variables with a meaningful difference and a straight relationship were found to be surface learning and challenge variables. Surface learning and challenge variables are influencing each other by 14%. ($r = .369$, $r^2 = .14$).

Qualitative Results

In this part of the study, the answers given by the students were analyzed and the answers obtained were interpreted. Opinion forms were given to the students to provide their opinions and to add comments. The results obtained from the opinion forms are given below.

When we look at the answers to the first question of the qualitative study, we see that the students' views on the Khan Academy course platform are generally positive. Some students have compared this platform with other MOOC platforms they have been a member of and have expressed a positive opinion, while others have indicated that they are happy to be members of this program and benefit from it.

Part of the responses of some students gave to the first question are given below.

- “This platform has affected my learning desire positively.”

- “I think the platform has a friendly interface ...”
- “I do not feel like the platform is an external environment. I feel like it is my class I attend every day.”

In the second part of the qualitative questions, students evaluated their own learning process. While the students generally evaluate their processes, they have interpreted this period as the best spent leisure time. Some students also stated that the learning process in the MOOC environment was more positive than in the classroom environment because they were attending classes when they felt good.

- “Listening to lessons when I'm feeling better gives me a better understanding of all the things being told.”
- “The use of the point system to communicate with the people who took the same lessons made me ambitious.”

In the third question of the research, the students made more criticism than the other parts. While the content of the lectures is generally enjoyed by the students, some students have criticized the superficiality of the videos and the language of the lecture. Although most of the courses on the Khan Academy platform have Turkish language support or Turkish subtitles, students complained that they could not benefit from these features in some parts of the course.

- “The videos were like a summary of the topic. It could have been more comprehensive “
Another negative respond was;
- “Not having Turkish subtitles in some part of the course made it difficult.”

Some of the positive answers are as follows;

- “The brief short break up of the subject descriptions kept my motivation and attention at the top.”
- “Quizzes and tests which were in the type of gamification made the lessons more fun for me.”

6. Conclusions

From the answers given by the students to the TAM variables Perceived Usefulness and Perceived Ease of Use survey in terms of the data obtained from this study, it was seen that the views about the Khan Academy MOOC platform were positive. Accordingly, courses on this platform, ie MOOCs, are both easy to use for students and can contribute to their personal or student life. This endorsement supports the answers given by the students to the opinion scale. The students who expressed a positive opinion about the Khan Academy platform stated that they were satisfied with both the use, the courses and the interface. When the learning strategies of the students are examined, the students were not classified as deep learners or completely surface learners. This suggests that both deep learners and surface learners have positive views about TAM.

In the cognitive appraisal dimension, students stated that they do not have any fear towards MOOCs, and that these environments are somewhat making them ambitious in both quantitative and qualitative dimensions. Students who responded to the challenge questions of the cognitive appraisal scale at the level of "Agree" indicated that the environment improves their challenge emotions when it is prepared in the form games on the view scale. Again, the results obtained by the research conducted by Aharony and Bar-Ilan support most of the data obtained from this study (Aharony & Bar-Ilan, 2016).

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