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Research Article

The Impact of MOOCS on Higher Order Thinking Abilities During the Covid-19 Pandemic

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ABSTRACT

This study set out to investigate how MOOCs affected higher order cognitive functions during the COVID-19 pandemic. Attending the College of Education, all participants were fourth-year students. They were split up into two groups for the experiment. To this end, a test of higher-order thinking abilities incorporating instructional strategies was created as one of the primary instruments. Results indicated that, in accordance with participants' higher-order thinking, there was a statistically significant difference in favor of the first experimental group's modified gain ratio of degrees between the second experimental group, which received learning via a learning management system, and the first experimental group, which received instruction through MOOCs.

Keywords: MOOCs, Blackboard, Learning Management System, and higher-order thinking skills.

INTRODUCTION

Due to increased awareness of online learning and the open access teaching movement, free online courses were made available to all students, and anyone with an Internet connection could now get large-scale instruction [1-3]. These days, the majority of postsecondary institutions use various educational technologies to provide a wide range of online learning possibilities, including Massive Open Online Courses (MOOCs) [4-8]. MOOCs are currently drawing a lot of interest from higher education institutions and the media. According to Elbyaly and Elfeky [9], Elbyaly and Elfeky [10], Elbyaly and Elfeky [11], MOOCs are a relatively recent example of online active learning, where active learning is essential to ensuring deep learning [12-15]. Additionally, MOOCs sparked a global interest for this pedagogical approach, which was seen to have the ability to completely transform the way that education is delivered [16-19]. According to a number of scholars Elfeky [20], Elfeky [21], Elfeky [22], Elfeky, Alharbi [23], Elfeky and Elbyaly [24], Elfeky and Elbyaly [25], Elfeky and Elbyaly [26], MOOCs have a great deal of potential to improve teaching and learning. Nevertheless, despite the many studies that have been done to examine the influence of specific individual characteristics on success in MOOCs, the role of metacognition skills in MOOCs is still not getting the attention it deserves [27-30].

Because MOOCs lack visual clues and body language, learning can be particularly difficult because of the asynchronous written engagement [31-33]. Stated differently, learning can be viewed as predicated on a sense of community and engagement [34, 35]. MOOCs are a type of online higher education that has a lot of promise to improve learning. As long as students are not in close proximity to one another, these interactions are primarily written and asynchronous and may have an impact on the learning strategy that they choose [36]. Another key component of MOOC course design is video lectures, where learning platforms gather data from web logs pertaining to students' interactions with the curriculum, such as video interaction events [37]. According to Elfeky, Najmi [38], cognitive involvement during video interaction includes pauses, reverse searches, and slow viewing of

videos. Allowing learners to interact with films through pause, backward seeking, and slow watching has been shown to greatly boost learning, according to experimental evidence from early research on interactive instructional videos in online learning [39]. In addition, a MOOC participant leaves a readily available record of their actions, including details about each time they start, stop, or rewind a video. In spite of these MOOC characteristics, the majority of prior research has not addressed the cognitive mechanisms that underlie video interaction events explicitly [40].

Furthermore, higher-order thinking abilities, or the abilities seen as the “higher end” of Bloom’s taxonomy (or any other taxonomy) and comprising analysis, synthesis, and assessment, are typically developed in e-learning environments [41]. According to Masadeh and Elfeky [42], one of the skills that students need to develop through teaching and learning is higher-order thinking skills. For this reason, studying MOOCs and their effects on the development of higher-order thinking skills is essential for effective learning. Consequently, the goal of this study is to determine how MOOCs affected higher order cognitive functions during the COVID-19 pandemic.

METHODOLOGY

One of the researchers invited participants via the Zoom platform to participate in a MOOC. During a 15-minute MOOC orientation presentation, it was explained how to use MOOC as a resource for creating research papers. Through the Zoom platform, assistance was provided as needed to finish the MOOC sign-up process. The research team—that is, the teaching team for the course—promoted and encouraged voluntary, free participation. Six weeks passed during the MOOC. Two blocks covering similar themes were added each week. Each block has two parts and 45 minutes allotted to reviewing background information. Assignments and tasks took up the first thirty minutes, with the remaining twenty-five minutes dedicated to watching videos.

Instruments of Data Collection

An exam for higher order thinking skills in "Educational Technology" was created in order to verify the research ideas. The test items were developed with the course objectives in mind. The test items also considered the academic background of the participants. There were eighteen different elements in the test's final edition. The test was first administered to thirteen students at the University of Najran. Such a pilot study sought to ascertain completion time, test validity, and test reliability. The expected time after completion was around twenty-one minutes. Test reliability was extracted using Cronbach Alpha, and the resultant value of (0.92) suggested that the results would be reliable when applied to the study sample.

Findings

The T-test for independent samples was employed following the explanation of the research methodology, the conclusion of the basic experiment, and the recording of participant grades on the higher-thinking abilities test for both experimental groups. Table (1) displays the significance of the adjusted gain ratio of the participants' grades in both groups.

Table 4: Significance of the Modified Gain Ratio for higher order cognitive skills participants' grades in both groups

Group	N	M	SD	Mean Difference	T. Ratio	Sig.
Experimental Group 1	31	16.4	2.49	4.1	4.7	.037
Experimental Group 2	31	12.3	2.85			

According to Table (1), there was a significant difference (F. ratio, T=4.7) between the adjusted gain ratio of students' grades in both experimental groups on the higher order thinking skills exam. Students in the first experimental group had a mean grade score of (16.4), but their counterparts in the second experimental group had a mean score of (12.3). In other words, the mean scores of the two groups differed significantly ($\alpha<0.05$) in favor of the first experimental group. Stated otherwise, the students in the first group, who were taught through MOOCs, had a greater modified gain ratio than their classmates in the second experimental group, who were taught using

the Blackboard system. Thus, it can be said that students in the first group were more affected by MOOCs in terms of their higher order thinking abilities than students in the second group. This, of course, shows how crucial it is for the Najran University college of education to use MOOCs in order to foster the development of higher order thinking skills.

DISCUSSION

The primary objective of the present study was to reveal how MOOCs affected higher order cognitive processes in the context of the COVID-19 pandemic. Some factors can be used to explain the study's major findings. First, the data imply that MOOC was more successful in encouraging higher order thinking skills. This finding supports the claims made by Medina and Castleberry (2017) that MOOCs enhance learning and thinking. Furthermore, this conclusion supports the findings of Arslan (2018) and Naimnule and Corebima (2018), who also discovered a relationship between the critical thinking skills and MOOC, with MOOC favorably predicting critical thinking. This kind of outcome validates that MOOC could offer assistance to participants in building on their prior ideas and in creating new ones in a logical manner. The results of this study also support the conclusions of Barak and Watted (2016), who suggested that a greater understanding of student characteristics from many disciplines should be included in MOOC success searches. To summarise, the results of this study have the potential to enhance research and practise concerning student profiles and learning outcomes in MOOCs, both during the COVID-19 epidemic and beyond.

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