THE INFLUENCE OF MASSIVE OPEN ONLINE COURSES (MOOCS) AND FACE-TO-FACE LEARNING ON MOTIVATION AND SELF-REGULATED LEARNING (SRL)

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ABSTRACT

This study, conducted in a small town in Indonesia, examined how Massive Open Online Courses (MOOCs) and face-to-face learning affected high school students' motivation and self-regulated learning (SRL). This research employed the quasi-experimental method. The sample was obtained randomly from 144 high school students. The study's primary instrument was a questionnaire with a five-point ranking scheme of 100 items to measure the students' SRL and motivation levels. The Cronbach's alpha value of the questionnaire was 0.959. This research indicated that face-to-face learning significantly affected the students' motivation compared to the MOOC class, but MOOCs and face-to-face learning did not affect students' SRL.

Keywords: *MOOCs, motivation, self-regulated learning, face-to-face.*

INTRODUCTION

It has been widely recognized that elearning offers flexibility as the answer to unequal access to education due to distance and time (Longstaff, 2017; Wong et al., 2019; Wu et al., 2018). Massive Open Online Courses (MOOCs) are a superior system compared to other elearning systems that allows education to be accessed effectively and efficiently (Fournier et al., 2014). MOOCs are interconnected learning to ensure easy access and global interaction between users and providers, either free or paid, to accommodate a large number of users (Saadatmand & Kumpulainen, 2014).

The development of MOOCs has transformed the face-to-face learning tradition by disrupting it (Al-imarah & Shields, 2018; Chen et al., 2002), and creating new challenges for students to achieve. Wong et al. (2019) explained that many students face difficulties in the online learning environment because they do not use the self-regulated learning (SRL) strategy. SRL in online learning has been identified as one factor for students to succeed (Cleary & Kitsantas, 2017; Pintrich & De Groot, 1990; Zheng et al., 2018). Furthermore, Alonso-Mencía et al. (2020) stated that MOOCs require students to be independent during their learning, and thus, they need to organize their learning to achieve their goals.

The online learning environment offers limited interaction for students, so they have to decide when to study or how to understand the learning materials. Therefore, the students' SRL ability helps them organize themselves and is an essential factor for succeeding. Pintrich (2004) stated that SRL enables students consciously monitor, control, and regulate several aspects of cognition, motivation, behavior, and the learning environment. Also, Zimmerman et al. (1992) stated that

students who organize their learning tend to be actively involved in learning because they can change their learning experience according to their strengths and limitations (Zimmerman, 2002). Lim et al. (2020) and Zalli et al. (2019) argued that SRL is a mediating variable affecting students' satisfaction while learning.

Many studies have been conducted on MOOCs and face-to-face learning. However, these studies are limited to a separate discussion of SRL and motivation in online learning based on MOOCs (Alonso-Mencía et al., 2020; Mahmud & German, 2021; Wandler & Imbriale, 2017; Wong et al., 2019) and SRL and motivation in face-to-face learning (Cleary & Kitsantas, 2017; Korpershoek et al.; Zeidner & Stoeger, 2019). Not many researchers use the MOOC system and compare it with face-to-face learning in researching both SRL and motivation. Zimmerman (2008) further argued that good SRL will lead to a positive motivational orientation in online learning. In line with this statement, Cleary and Kitsantas (2017), Yun and Park (2020), and Henderikx et al. (2019) found that motivation and SRL are two factors that can affect learning achievement. Therefore, further investigation is needed relating to this matter leading to this study. The research questions of this research were as follows:

1) How do Massive Open Online Courses (MOOCs) and face-to-face learning affect high school students' motivation?
2) How do Massive Open Online Courses (MOOCs) and face-to-face learning affect high school students' SRL?

LITERATURE REVIEW

Self-Regulated Learning (SRL) on MOOCs and Face-to-Face Learning

SRL is a three-phased, interdependent process that includes forward-thinking, volitional performance or control, and self-reflection. Setting learning goals and the strategic planning to accomplish them occurs during the forward-thinking phase. The action to attain the specified learning objectives that were planned in the previous stage is implemented in the performance or control stage. The students apply learning tactics, monitor their performance, and track their progress throughout the performance phase. Students reflect on the outcomes they acquired in the self-reflection phase, taking into account the goals specified in the forward-thinking phase. In this last phase, students think about whether or not they need to change their behavior to be more successful in the future (Chung, 2001; Zimmerman, 2002, 2008; Zimmerman & Martinez-Pons, 1990).

Due to the nature of MOOCs, which demand independent learning (Shao et al., 2020; Yu & Watson, 2020), student success is determined by a well-regulated motivation (Park & Yun, 2017). The motivational component will direct students to determine their learning goals (Pintrich & De Groot, 1990). Much research has been conducted to address the possibility of low motivational support in online learning. Several studies focused on treatments that lead to online learning designs' motivational improvement. For example, Gaoet al. (2019) developed a theoretical model of emotional participation in online learning. Motivation includes self-efficacy, intrinsic value, task interest, and anxiety (Cleary & Kitsantas, 2017; Pintrich & De Groot, 1990). Self-efficacy often acts as a reliable mediator of the relationship between motivation variables (Sakiz et al., 2012). Task interest is an essential predictor of students' behavior as a significant achievement.

Motivation in MOOCs and Face-to-Face Learning

Needs-based motivation (Greene et al., 2015) and interest-based motivation (Greene et al., 2015) are two types of motivation that can be found in MOOCs and face-to-face learning (Shen et al., 2003). It is the goal of need-based motivation, according to Ahl (2008), for individuals to register for and complete a lecture both online and offline in order for their knowledge, abilities, and attitudes to be complementary. Meanwhile, interest-based motivation is linked to powerful motivators (as in items or objects) for online and offline learning (Tsai et al., 2018). Shen et al. (2003) and Sun et al. (2019) found that motivation that emerges from interest, which arises from engaging with the environment, is the most important source of motivation. Furthermore, Shen et al. (2003) showed that interests are personal or situational.

Needs-based motivation arises because of

several motives, namely academic (Zimmerman, 2008), course (James, 2020), and professional (Doo et al., 2020). On the other hand, interest-based motivation arises because of social motives (Aldowah et al., 2020; Godman, 2013), personal motives (Aldowah et al., 2020; Bonk & Lee, 2017; Petronzi & Hadi, 2016), and technological motives (situational) (Joo et al., 2018; Shapiro et al., 2017; Zhao et al., 2020).

RESEARCH METHOD

Tenth-grade students from six public senior high schools in Bandar Lampung, Lampung Province, Indonesia, were randomly chosen to answer the proposed research questions. The teachers voluntarily assisted the process at these schools. A total of 144 students were registered as participants, 75% of whom were female and 25% were male. Half of the participants were randomly assigned to the experimental group, the class with MOOCs, and the other half were randomly assigned to the control group, the class with face-to-face learning. This research started in January 2020 and ended in March 2020, just before the lockdown policy was implemented in Indonesia.

Before the study began, all the participants completed a physics ability test on a one-dimensional motion to determine whether the two groups had homogeneous physical abilities. The instrument consisted of 20 questions developed by the physics teacher team at Bandar Lampung. The mean score obtained in the experimental class was 74.58, and the mean score obtained in the control class was 73.54. The standard deviation of the experimental class was 8.506, and the standard deviation of the control group was 8.326. Then, the results of the *t-test indicated that the two classes possessed no significant difference in physics skills, especially on the one-dimensional motion topic ($t = 0.743$ and $p > 0.05$). These results indicated that the two classes had the same physics ability.*

The instrument of this research was a questionnaire that consisted of one hundred items to measure the level of students' SRL and motivation. The questionnaire was adapted from Pintrich and De Groot (1990) with a 5-point ranking scheme. The Cronbach's alpha value of the questionnaire was 0.959.

At the beginning of the learning activities, both classes were informed about the physics learning objectives and the learning procedures to achieve these objectives. The experimental class applied the MOOC learning system independently. The students were free to choose the MOOC service providers, as was in line with the concept proposed by Longstaff (2017) called Empowerment in MOOCs. In this concept, students are given the capacity and freedom to decide and act to achieve the desired results relevant to the learning objectives. However, their attempts at using MOOCs were restricted to two trials, and the time they spent reviewing the tasks was two days. The Ministry of Education and Culture of the Republic of Indonesia has several MOOC platforms useful for high school students in Indonesia that may be accessed 24 hours a day. These platforms include Ruangguru, Pahamify, and Rumah Belajar. They are straightforward and do not require any particular training to use. The technological prerequisites are that a device be linked to the internet and that it has a web browser application.

The control class learned through conventional learning that involved face-to-face learning. The same physics learning assignment was also given to both the experimental and control classes. After the learning process had been completed, the two classes were given a questionnaire to compare the SRL and motivation. The final step was data analysis using the Multivariate Analysis of Variance (MANOVA) technique.

In addition, three students from each class were interviewed to investigate further their perceptions regarding their motivation and SRL. The probabilistic equivalence was considered in sample selection; therefore, the sample was selected randomly. The questions posed to them were as follows:

1) (Code QE1) "During the MOOCs class, how did you regulate yourself to study? Please explain briefly."
2) (Code QC1) "During face-to-face learning, how did you regulate yourself to study? Please explain briefly."
3) (Code Q2) "During the lesson, did you encounter boredom? Why?"
4) (Code QE3) "Question for the MOOCs class: Do you prefer studying with MOOCs or face-to-face learning in class? Why?"

Table 1. Summary of Research Results

Aspects	Class	Mean	Std. Deviation	N	Levene's Test	Multivariate tests	Tests of Between-Subjects Effects
Motivation	MOOCs	2.996	0.588	72	0.667	0.001	0.001
	Face-to-Face	3.353	0.542	72			
Self-Regulated Learning	MOOCs	3.355	0.688	72	0.330		0.370
	Face-to-Face	3.454	0.626	72			

5) (Code QC3) "Question for the face-to-face class: If you are asked to choose, do you prefer studying with MOOCs or face-to-face learning? Why?"

FINDINGS

Motivation and SRL Analysis

Several tests were performed based on the students' questionnaire answers to determine the motivation and SRL of the experimental and control classes. The results are shown in Table 1.

Table 1 shows that the average value of motivation for the face-to-face class was higher than the MOOCs class. Likewise, the average value of the SRL in the face-to-face class was also higher. The multivariate test showed $p < 0.05$, which means that the MOOCs and face-to-face classes had different motivations and SRL.

Table 2. The Transcript of the Interview

Class	Question	Respondents' Code	Answer
Experimental	QE1	SE1	"I used to schedule my study every day, even though there is no homework."
		SE2	"My parents always remind me to study, and I do it."
		SE3	"I have a tight study schedule to pursue my dreams."
	Q2	SE1	"Yes, I feel bored of studying at home without meeting my friends."
		SE2	"Really bored; I miss someone."
		SE3	"I prefer to study alone. I also have a good place to ask questions at home, at the class is very uneasy."
	QE3	SE1	"To be honest, I prefer studying in class and meeting my teachers and friends."
		SE2	"I prefer studying in class because there is someone I like there."
		SE3	"I hesitate to answer it. On the one hand, I need peace in studying; on the other hand, I also want to meet my physics teacher."
Control	QC1	SC1	"I only study in class. At home, it is time to help my parents' business."
		SC2	"I took tutoring outside of school until night."
		SC3	"I always relearn what I got in class."
	Q2	SC1	"I am bored in class and excited during recess time."
		SC2	"I am never bored to study anywhere; I like the challenge."
		SC3	"I never feel bored. I have promised myself."
	QC3	SC1	"I like studying in class because it is difficult to access the internet at home."
		SC2	"I prefer face-to-face learning because there is much material for us to discuss in class."
		SC3	"I chose face-to-face learning because I do not have a gadget."

The test of between-subjects effects using the Bonferroni test (Sig. 0.025) indicated that the motivation data was $p < 0.025$. Thus, it can be concluded that the results were significant. The results indicated that the MOOCs and face-to-face classes had different motivations because the average score of the face-to-face class was higher than the average score of the MOOCs class. Therefore, the face-to-face class had significantly higher motivation than the MOOC class.

Furthermore, the SRL's p-value was more than 0.025, and it can be concluded that the result was insignificant, indicating no significant difference between the MOOCs and face-to-face classes regarding the SRL.

The Results of the Interview

The interview results on students' perceptions regarding MOOCs and face-to-face classes are shown in Table 2.

In the experimental class, QE1 showed that students were used to managing their study schedules and their parents also reminded them to study. In Q2, students agreed that self-study using MOOCs was boring. Their main reason was a lack of interaction, although there was one respondent who answered that they received adequate support while studying independently at home. In QE3, although one student was hesitant to choose, the third answer led them to choose face-to-face learning because they wanted to be involved in social interactions during class.

In the control class, QC1 showed that they liked learning in class so that the rest of their time could be used for other things. In Q2, two respondents stated that they liked how they learned in class due to the opportunity to interact. One respondent gave a different statement, that they were bored in class. In QC3, they generally preferred face-to-face learning because they could discuss it directly, had difficulty accessing the internet, and did not have a gadget.

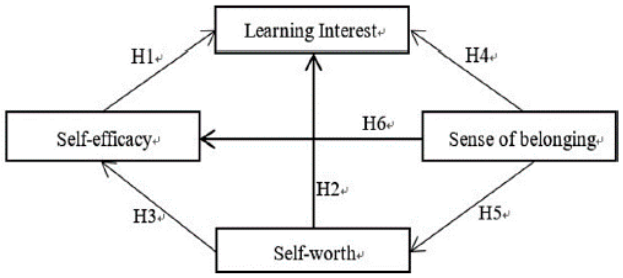
DISCUSSION

This research aimed to examine whether face-to-face and MOOC classes influenced motivation and SRL. Based on the research results, face-to-face learning significantly affected students' motivation compared to MOOC classes. The finding was supported by previous studies, which stated that teacher-student and student-student interactions have strong relevance to learning motivation (Kerssen-Griep, 2001). When learning in class, communication skills can be built to maintain the orientation toward the learning goals.

Each system's learning environment has different features in the MOOCs class, depending on the service provider. Therefore, communication is created between humans and machines. Park et al. (2015) found that many students found it difficult at the beginning to use MOOCs services (i.e., communicating with the system), thus affecting their psychology and ability to continue independent learning. Almost all MOOCs provide communication opportunities via third-party applications. However, not all of the students used this feature. Kop (2011) states that interactions in MOOCs are sourced from connectivity between users, so the experiences students get will undoubtedly be different and affect each individual differently.

Students' boredom in the MOOCs class shows an absence of emotional participation, which is defined by an interest in learning, self-efficacy, a sense of belonging, and self-esteem (Gao et al., 2019). Figure 1 shows the theoretical model Gao et al. (2019) came up with for how to build emotional participation.

Figure 1. The Theoretical Model of Emotional Participation in Online Learning (Gao et al., 2019)



Face-to-face classes also pose real challenges to students (Sungur & Senler, 2010). These challenges are conscious and planned, created in the classroom environment, and produce social conditions that support intrinsic and extrinsic motivation, especially interest. Physical, institutional, pedagogical, teacher-related, student-related, technology, and instructor support to overcome difficulties are challenges that students face at various institutional levels. Physical difficulties arise due to classroom architecture and layout, and furniture placement can

obstruct students' views or separate teachers from students. These all represent the one-way transmission of knowledge and communication.

Institutional problems include a vast and diverse student population, large teacher workloads, a poor work environment, a lack of instructional time, a bad departmental or school culture, insufficient funding, and weak academic staff dedication. Further, pedagogical frameworks and approaches are tied to pedagogical issues, which innovation, professional development, and personalization of learning and assessment techniques are insufficient to overcome. Challenges related to teachers are their conceptions of teaching, logistical problems and structuring large classes, a lack of digital competence in how to use technology and innovative teaching practices, and a shortage of equipment. Also, there are other challenges, such as professional vulnerability, a heavy workload, and stress due to the expectations of students' active teaching practice.

The challenges that students face are their expectations, their need for self-regulation, a diffusion of responsibility, learner avoidance of tasks, a lack of effort, a lack of self-responsibility, and trouble managing collaborative skills. Time, the functionality of equipment and support staff, a lack of training in technical equipment, a lack of quality digital tools, the flexibility of location, and restrictions on ICT on school PCs are all technological challenges everyone faces. The challenges in teacher support to overcome obstacles are professional support in changing learning environments, encouraging innovation and risk-taking, deploying teaching assistants, and developing a support framework that incorporates cooperation, research, and evaluation (Børte et al., 2020).

Face-to-face classroom learning in Indonesia has encountered several obstacles during the previous decade. Teachers in Indonesia, for example, lack pedagogical content skills, such as lesson planning, using learning models and strategies, generating learning evaluations, performing laboratory work, developing learning media, and integrating technology into learning. Students in Indonesia face various obstacles during face-to-face learning, including difficulty grasping learning concepts and poor class motivation (Misbah et al., 2022; Widodo & Riandi, 2013).

Unlike face-to-face classes, whose challenges tend to be content related, MOOCs have both content and technical challenges. Technical challenges are created during the online independent learning process and consist of six variables: (a) opportunity to learn, (b) effort, (c) ability to understand instructions, (d) persistence, (e) quality of learning design, and (f) support and presence (Davis et al., 2016; Park et al., 2015). Also, Alcorn et al. (2015) and Virani et al. (2020) state that the availability of internet access, tools for retrieving course content, vigorous English, and free time are also challenges. According to Virani et al. (2020) and Alcorn et al. (2015), these challenges are faced and resolved differently by each student. Park et al. (2015) state that many students give up and leave their MOOCs for a long time.

Mages (2007) stated that teachers' vision of professional pedagogy and classroom management is essential in increasing classroom learning motivation. In the face-to-face learning process, a professional-pedagogical vision identifies and interprets important things obtained during the learning process to be developed, used, and reinterpreted (McDonald et al., 2019). Class management by teachers will determine whether or not students are able to learn in the classroom (Slater & Main, 2020).

It is undeniable that MOOCs provide better class management features than face-to-face learning, such as collaborative learning, flexibility, varying levels of openness, high-quality content, a question bank with results linked to teachers/schools, analysis features to determine how they learn, learning methods, ability level, learning team, and features analysis to determine their level of experience in class discussions. However, based on the findings by Virani et al. (2020), these features are rarely used by students. Many students do not have the courage to try new things in MOOCs, so their only activities are to watch videos and read the learning materials.

Besides, the findings in our research indicated that the higher motivation in face-to-face classes was influenced by culture (Gao et al., 2019; Park et al., 2015; Tang & Neber, 2008), which had a strong relationship with the characteristics of students (Luik et al., 2020). Students will be more motivated when learning with MOOCs if there are symbols of institutional culture, behavioral culture, and spiritual culture. When students finish their registration to study through MOOCs, a welcome reply letter in the local language is automatically

delivered to their email. For example, when using MOOCs, students may be greeted by religious symbols (Gao et al., 2019), But there are hardly any MOOC platforms in Indonesia tailored to the local culture. In actuality, Indonesia's culture and religion/beliefs are extremely diverse, and each region's inhabitants hold them dearly. This fact demonstrates that MOOC participants originate from various cultures, ages, educational levels, traits, and motives (Park et al., 2015). As a result, if there are symbols that symbolize the identity and qualities of students, there will be a higher level of positive learning motivation (Luik et al., 2020; Tang & Neber, 2008).

The next finding was that the two classes did not affect the students' SRL. The *p-value of the SRL was greater than 0.025, so it was insignificant. In our research, students were given the freedom to manage their participation and learn in the MOOCs and face-to-face classes. However, according to* Pintrich (2004), SRL is not solely related to motivation, self-regulation, individual cognition, interaction behavior, goals, and eventual achievement; it is also related to cultural, demographic, or class environmental characteristics.

Moreover, SRL is closely related to the feeling of being watched when studying (Chung, 2001; Pintrich & De Groot, 1990; Zimmerman, 2008; Zimmerman & Martinez-Pons, 1990). Students receive direct instructions and feel monitored by the teacher during face-to-face learning. In contrast, the system delivers instructions when using MOOCs, and the system also carries out supervision. It provides the same learning sensation as it ever did, but with a unique learning experience (Wong et al., 2019).

Before and when the research was conducted, one hundred and forty-four students organized themselves according to their respective expertise. There was no other intervention to fix the things they were lacking. Thus, their self-regulation skills were not as good as students who already knew the SRL strategy. The results of the interviews in the experimental class (QE1) and the control class (QC1) showed that nothing had changed from the way they learned, i.e., the conventional way. This is in line with what Sari (2012) found. They do not know how to deal with modern, global problems because they have been used to the traditional education system's way of thinking.

CONCLUSIONS, SUGGESTIONS, AND LIMITATIONS

This research shows that face-to-face learning significantly affects senior high school students' motivation compared to Massive Open Online Courses *(MOOCs), but it also found that neither class affected the students' SRL.*

This research has several limitations. First, the research sample was small, limited to only one city in Indonesia. Considering that motivation and SRL are closely related to demographics and culture, it is difficult to generalize the results of this research in the context of the Republic of Indonesia. Second, this research was focused on physics learning, precisely one-dimensional motion material. Given the various difficulty levels and discussions in physics, future research should focus on other topics. Third, the research time was short; therefore, it will be interesting if future research studies the same thing for an extended period.

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