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Students' Perceptions of Using Massive Open Online Courses (MOOCs) in Higher Learning Institutions in Tanzania

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ABSTRACT

The massive investment by Higher Learning Institutions (HLIs) in ICT is evidence that institutions are recognizing technology's potential in their operations. However, the phenomenon of Massive Open Online Courses (MOOCs) in Tanzanian HLIs is not well investigated by researchers. The aim of this study, therefore, is to investigate the perception of students in using MOOCs to flip classrooms in HLIs. The study employed a quantitative methods design administered by questionnaire. The study involved 111 undergraduate and postgraduate students from the State University of Zanzibar (SUZA) and the University of Dodoma (UDOM). The study findings indicate that 76% of the respondents agreed that there are many benefits of using the MOOCs learning strategy in HLIs. The study findings also revealed that 82% of the respondents agreed that use of the MOOCs learning strategy in HLIS affects students' performance. Hence, the study reported that 82% of the respondents confirmed that a low level of Internet access is a challenge for students and instructors to adopt MOOCs learning strategies. The study concluded that use of the MOOCs learning strategy has many benefits to HLIs and is an effective means to provide quality teaching and learning. The contribution of the study is that the HLIs should adopt MOOCs learning strategy to enable student learning in a variety of courses from different institutions and become culturally competent.

Keywords: *MOOCs learning strategy; flipped classrooms; quality of teaching; higher learning institution] students' performance*

INTRODUCTION

Digital technologies continue to develop at a rapid pace in higher learning institutions (HLIs). HLIs, particularly in developing countries, are struggling to provide high-quality instruction at a low cost. In this context, there is a need for a paradigm shift to massive knowledge sharing such as, Massive Open Online Courses (MOOCs) which are expected to solve pedagogical, strategic, and economic issues in HLIs (Feitosa de Moura et al., 2021). MOOCs have been used in HLIs as a new form of blended learning that combines face-to-face learning and innovative learning through digital technology. Basically, blended learning has been widely identified as a combination of face-to-face and online learning activities (Friesen, 2012). As an instance of blended learning, blended Massive Open Online Courses (bMOOCs) aim at bringing in-class (that is, face-to-face) interactions and online learning components together in a blended environment, taking into account the important openness factor in MOOCs. Digital technologies offer a wealth of ways in which learners can interact with multimedia, and communicate and collaborate with instructors and peers (Conole et al., 2014). The effective use of technology in teaching and learning enhances students' understanding and improves their performance (Shaame et al., 2020). Technological paradigms have shifted to blended learning, flipped classrooms, and distance learning as well. In fact, a

blended learning design based on MOOCs provides several motivations to students and instructors, such as attracting students learning, increasing the level of knowledge, and improving course delivery quality (Feitosa de Moura et al., 2021).

Many higher learning institutions have been engaged in offering MOOCs to improve students' academic achievement, and experience, and change students' attitudes toward learning (Alanazi & Walker-Gleaves, 2019). The main goal of using MOOCs in HLIs is to enable people across the globe to access high quality topics in the professional field and higher education from qualified instructors regardless of countries' differences, socioeconomic status and educational background, as long as they have access to the Internet (Bokova & Kabanova, 2021). MOOCs provide academic transformation into high quality open courses for free registration offered by leading universities to any learner around the world. Alanazi & Walker-Gleaves (2019) noted that MOOCs provide for integration of the process, pedagogies, and elements to enhance instructors' facilitation of learning activities. However, MOOCs can be considered as a new teaching technology, not yet practiced in many universities (Wang & Zhu, 2019). While MOOCs were a buzzword for the US and Europe, its implementation faced many challenges in developing countries (Goglio, 2019), encouraging students in some developing countries to have doubts about the quality of MOOCs academically (Sukhbaatar, Choimaa & Usagawa, 2018). However, because of the numerous benefits for both instructors and students, many universities have incorporated MOOCs into their curricula, with increasing adoption of MOOCs every year (Bokova & Kabanova, 2021).

In order to address MOOC adoption challenges in a higher education context, the new design paradigm of bMOOCs can resolve some of the hurdles facing standalone MOOCs (Bruff et al., 2013). In fact, the bMOOC model has the potential to bring human interactions into the MOOC environment, foster student-centered learning, provide effective assessment and feedback, support the interactive design of the video lectures, and consider the different patterns of participants in MOOCs (Yousef et al., 2015). For example, the video lectures and notes are uploaded in the learning management system, whereas the students watch the video lectures and do assessments online, while the students' engagement activities, such as discussions that focus on higher-order students' thinking and collaboration, will be conducted in the classroom.

In general, people are most strongly motivated to learn when they are actively involved and clearly see a need to know. Active learning may embrace a number of inductive educational techniques and constructivist methods, one of which is a pedagogical model called the *flipped classroom*. In a flipped classroom, the typical lecture and homework elements of a course are reversed. Readings and lectures are performed by students at home, while classroom sessions are devoted to exercises, projects, or discussions. A literature review shows that Open Educational Resources (OER) and MOOCs can be used to support flipped classroom approaches to enhance students' engagement and improve academic performance ability (Dalipi et al., 2017; Alanazi & Walker-Gleaves, 2019).

This paper is focused on examining students' perceptions of using MOOCs in HLIs, particularly in developing countries. Despite the fact that the use of MOOCs in flipped classrooms represents a new challenge for HLIs (Jordán et al., 2021), the adoption rate of MOOCs in developing countries is very low despite the promise of MOOCs in changing students' behavior towards learning by providing high-quality learning (Abdel-Maksoud, 2019; Jordán et al., 2021). In Tanzania, for example, adoption of MOOCs has insufficient attention and is not a hot agenda topic among educational practitioners and policymakers. Therefore, this paper aims to explore students' perceptions, teachers' interests, and barriers to using MOOCs in learning.

The use of MOOCs to flip classrooms along with OER provides new opportunities in developing countries by providing students with a positive attitude toward learning and helping them learn according to their individual learning abilities (Dalipi et al., 2017; Alanazi & Walker-Gleaves, 2019). However, little attention has been paid to the effectiveness of using MOOCs to flip classrooms, specifically in developing countries. MOOCs' support for flipping classrooms is still in its early stages and has received little attention in the earlier research (Dalipi et al., 2017; Wang and Zhu, 2019). This study will attempt to bridge this gap by investigating the students' perceptions of using MOOCs to flip classrooms in HLIs and will propose effective measures to encourage HLIs to adopt MOOCs to flip classroom learning strategies to enhance students' engagement and improve their academic performance.

THEORETICAL FRAMEWORK

The theoretical framework that frames this paper is learning theory. Basically, MOOCs are dynamic learning processes with flexible time frames. To achieve the learning goal of a lesson, the lesson should be personalised, involving higher engagement and motivation in collaborative learning activities (Manathunga et al., 2017). The analysis and evaluation of MOOCs learning are based on learning theories such as constructivism, connectivism and social learning (Fasihuddin et al., 2013; Kesim & Altınpulluk, 2015; Manathunga et al., 2017 & Rumjaun & Narod, 2020. Constructivism theory to enhance learning facilitated by technology provides for the technological learning environment to enhance understanding of reality and the design of knowledge as a social activity (Mattar, 2018). Connectivism is a key concept in an information and network age and assumes that learners have ubiquitous access to networked technology and they are not to memorize but their role is to find and apply the knowledge when needed (McLoughlin, 2013). According to Rumjaun & Narod (2020), social learning involves science teaching and learning activities such as observation, motivation, and collaborative learning.

The study employs learning theory to justify the student's learning through a collaborative and social learning space in the learning process using technology. MOOCs enhance students learning in social and collaborative learning with structured activities (Manathunga et al., 2017). Hence, social learning theory opines that learning is the result of experience of others' behavior and its consequences (Gondwe, 2021). Manathunga et al. (2017) insisted that social learning provides conversation learning enhanced by pedagogical consideration in the design, whereas many people can join in learning with richer instruction. Anderson et al., (2020) found that social technology tools, such as MOOCs, have become more prominent in recent years.

Technology-based learning provides positive student outcomes, including increasing students' motivation, positive attitude, cognitive learning achievement, and learner self-regulation (Anderson et al. 2020). As indicated by Bower (2019), technology itself has no intentions, but rather it is a featured object that is used to convey meaning among participants. As a result, it should be influenced to provide the meaning of the specific intention. The impact of technology-based learning and social technology learning influences students' perceptions of its usefulness in learning and ease of use, which in turn influences students' attitudes and behavior, resulting in increased students' performance (Anderson et al. 2020).

The important point to consider in the employment of learning theory in a MOOCs' learning strategy is that technology learning occurs when there is access to technology, enhanced with a social learning environment. The social learning environment influences participants and creates a learning environment rather than technology being considered automatically with fixed effects (Bower, 2019). The technology used in educational settings should be carefully chosen, designed, and contextualized (Oliver, 2013). Hence, the theorization of learning theory in MOOCs encourages massive student enrollment in MOOCs to gain a deep understanding of the learning.

LITERATURE REVIEW

Features of MOOCS

According to Razami & Ibrahim (2020), MOOCs are a paradigm of blended learning, digital classroom, open distance education, and the flipped classroom, that have attracted millions of people globally for its ability to complement traditional classroom settings through technological integration that influences students' learning experiences. MOOCs originated from Open Educational Resources (OER) with its philosophy of offering free content and courses (Cha & So, 2020). Varsity, Open2Study, Coursera, edX, Future Learn, Udacity, Udemy, and Master University are some of the popular platforms for transferring the content of MOOCs (Raju, 2018). MOOCs emerged from distance education and have discrete features to make them available online or through blended learning. The most appealing MOOC features for HLIs are openness and reputation.

Openness: Over time, the open educational community, such as that of MOOCs, has focused on increased openness, such that educational materials that emerge from the community are both visible and accessible, with free access to everyone, greater choice, and flexibility (Alraimi et al., 2015). As a result, the research has shown that a large proportion of students are interested in MOOCs because of their massive and open nature, instead of receiving any type of certificate or gaining academic credits (Chiappe-Laverde et al., 2015). In fact, the main advantages of adopting the MOOCs learning strategy are its wide accessibility and openness, which enable a massive number of students to register for the course regardless of their geographical location, cultural background, education level, income, and background differences (Bokova and Kabanova, 2021).

Reputation: The reputation of an institution is attractive to students because it represents the perceived excellence of the institution that guides the decisions of prospective students to attend the institution (Bourke, 2000). MOOCs increase the visibility of the institutions and promote lifelong learning opportunities with flexible pathways to the international community (Cha & So, 2020). Thus, reputation might be a critical determinant of a student's attitude towards a course or university in the early stages of a program when the student has no experience upon which to base an assessment of the merits of the program or university (Delgado-Marquez et al., 2013). Cha & So (2020) insisted that through MOOCs, the university can expand its curriculum and learning opportunities to global cultural knowledge and partnerships for the benefit of its students. The adoption of MOOCs assists in curriculum innovation and teaching reform (Li, 2019).

Contribution of MOOCs in Learning

The traditional teaching mode can no longer meet the personalized educational requirements of the current learners in this modern era surrounded by information technology, whereas instructors and students' innovation are highly valued (Li, 2019). MOOCs provide golden opportunities for students accessing high-quality learning easily and for instructors gaining new teaching techniques and enable offer teaching capabilities and valuable knowledge to a larger platform worldwide (Li, 2019). Another benefit of using MOOCs in learning is that it offers a balance of different instructional strategies that help students develop a long continuum of learning methods and get more experience and autonomy in the lesson (Alanazi & Walker-Gleaves, 2019). Cha & So (2020) noted that MOOCs comprise massive and diverse learners all over the world accessing free and high-quality learning materials and that they can personalize their learning in terms of topics, place, time, and methods of teaching.

More recent research on MOOCs focuses more on student participation and engagement patterns

for student success, such as grading student assignments, earning certificates, and students' doggedness until the course is complete (Williams et al. 2018; Chansanam et al. 2021). Students are much more interested in using MOOCs to learn not only to advance in school and career but also to improve their understanding of the topics well or to learn new topics in order to improve their knowledge in a specific area (Williams et al. 2018).

METHODOLOGY

Research Design

The study employed a quantitative research design. This research design is suitable for this study to ensure the statistical data on using MOOCs learning strategies are collected and analysed from a large number of respondents. The quantitative data were gathered from SUZA and UDOM using an online Google form.

Population and Sampling

The population of the study is higher learning institutions in Tanzania. The purposive sampling technique was used to select two universities - SUZA and UDOM - that have been using Open Educational Resources (OER) in teaching for a long time, yet they are not established as offering MOOCs, but they have planned to introduce MOOCs to improve teaching and learning. PSUZA has a plan to establish Swahili MOOCs and the University has invested in a studio for recording lessons and has technological and pedagogical expertise to ensure effective delivery of Swahili MOOCs.

Participants

The participants of the study were undergraduate and postgraduate students from SUZA and UDOM who volunteered to participate in this study by filling in a Google form online. The link to the questionnaire was sent to the students through Whatsapp groups to fill out the form. A total of 111 participants filled out the form and their responses were analysed accordingly.

Instruments

The study was administered by a questionnaire using a Google form. The students filled the questionnaire form anonymously and provided their opinions clearly and openly via the online e-questionnaire which included informed consent acknowledgment and was comprised of two parts: the first part involved demographic characteristics of the participants, which consisted of questions like gender, age group, university, and education level. The second part consisted of questions related to the level of agreement on using MOOCs in higher learning institutions. This part contained questions that asked the respondents to rank their answers. Likert type questions were used to determine the students' attitude, opinions, and behavior toward using the MOOCs learning strategy in the HLIs. The Likert scale included questions with values such as strongly agree =1, agree =2, undecided =3, disagree =4, and strongly disagree =5.

Data Analysis

Data from the Google Form was exported to the Statistical Package for Social Sciences (SPSS) version 20. The data were analyzed and Tables in terms of frequency and percentage were drawn. The Tables were then imported to Microsoft Excel for calculating summation and averages. The responses to the questionnaire items together with the Tables formed the cases for the discussion below.

RESULTS AND DISCUSSION

This study was conducted to investigate students' perceptions of using Massive Open Online Courses (MOOCs) to flip classrooms in higher learning institutions. Consequently, this section reports and discusses the results of the study.

Demographic Information of the Respondents

The demographic information of the respondents in this study refers to gender, age group, education level, and university at which they are studying. This study involved 111 undergraduate and postgraduate students from SUZA and UDOM. The majority of the students, 52.3% were male, and 84.7 % were undergraduate students who were aged between 18 and 30 years as shown in Table 1. This indicates that the majority of students who participated in this study are males who are taking undergraduate programs with the age group between 18 and 30 years old. Thus, the HLIs have large group of students who can follow technological innovation to improve teaching and learning.

Table 1: *Demographic Information of the respondents*

Categories	Percentage
Gender	
Male	52.3
Female	47.7
Age group	
18 – 30	85.6
31 – 45	14.4
Education Level	
Undergraduate	84.7
Postgraduate	15.3
University	
SUZA	71.2
UDOM	28.9

Benefit of Using MOOCs

The benefit of using MOOCs can be measured by the capability of achieving the teaching and learning goals of the university. Despite the fact that MOOCs learning strategies are not yet common in many HLIs, particularly in developing countries, the use of MOOCs has many benefits for students. The study finding in Table 2 shows that most students declared that the use of MOOCs in learning results in many benefits to students.

Table 2: *Benefits of using the MOOCs' Learning Strategy*

Benefits of using MOOCs	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
I do have the eagerness to learn using MOOCs learning strategy	23 (25.6%)	43 (47.7%)	20 (22.2%)	1 (1.1%)	3 (3.3%)
The use of MOOCs learning strategy often aids students learning ability	45 (50%)	35 (38.8%)	6 (6.7%)	1 (1.1%)	3 (3.3%)
MOOCs learning strategy makes learning effective for student	41 (45.5%)	41 (45.5%)	4 (4.4%)	1 (1.1%)	3 (3.3%)

Table 2 further shows that most respondents 82 (91%) agreed that MOOCs learning strategy makes learning effective for students which means that the use of MOOCs improves students' performance. Hence, the study also reveals that some respondents 20 (22%) were undecided about the use of MOOCs, while 4 (4.4%) disagreed that the use of MOOCs improves their learning. This means that there are some students who did not understand the importance of using MOOCs in learning. Thus more capacity building through training, workshops, seminars and webinars is needed in the university to make students aware of the use of MOOCs to improve learning.

The findings of the current study regarding the benefits of using the MOOCs learning strategy are similar to the study conducted by Shah et al. (2022) in India, which found that HLIs use MOOCs and gained many benefits. Shah et al noted that among the benefits that HLIs gained included increasing the efficiency of education delivery by promoting active participation, motivation, and enhancing students' engagement with the learning materials through peer learning and feedback. A study by Abu-Shanab & Musleh (2018) in Qatar found that MOOCs improved the learning process by simplifying learning, enhancing students' knowledge, and increasing productivity and efficiency of learning. Therefore, the uses of MOOCs as a learning strategy provides many benefits to students in HLIs.

The Effects of Using MOOCs Learning Strategy

The students' performance should be increasing gradually within the lifetime period in HLIs. Employment of the MOOCs learning strategy is one among the best options for increasing student performance in HLIs. The data in Table 3 reveals that use of the MOOCs learning strategy contributes to students' performance. Most of the respondents agreed that use of the MOOCs learning strategy affect students' performance positively.

Table 3: *Effect of using MOOCs*

Effects of using MOOCs	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
MOOCs learning strategy has effect on students' performance	33 (36.7%)	48 (53.3%)	3 (3.3%)	3 (3.3%)	3 (3.3%)
I had a favorable perception about MOOCs learning strategy noting the ability to pause, rewind and review	26 (28.8%)	54 (60%)	6 (6.7%)	3 (3.3%)	1 (1.1%)
I found the use of MOOCs is interesting in teaching and learning process,	45 (50%)	38 (42.2%)	3 (3.3%)	1 (1.1%)	3 (3.3%)
The use of MOOCs learning strategy has positive impact on students learning	40 (44.4%)	43 (47.7%)	4 (4.4%)	1 (1.1%)	2 (2.2%)
MOOCs learning strategy enhance students' knowledge of basic concept that had been taught	39 (43.3%)	43 (47.7%)	4 (4.4%)	1 (1.1%)	3 (3.3%)

The data in Table 3 reveals that most respondents 83 (92.1%) agreed that use of the MOOCs learning strategy has a positive effect on students learning. This means that the HLIs management team should consider establishing MOOCs in different disciplines for the students to get additional knowledge that assist them in their programs. However, there are some respondents 6 (6.7%) who were undecided on using MOOCs and 4 (4.4%) who have a negative perception of using the MOOCs learning strategy. This implies that university management and lecturers should consider using a different motivation approach such as short training, and webinars to attract students and facilitate use of MOOCS in learning.

MOOCs in flipped classroom improve Teaching and Learning

Use of the MOOCs learning strategy to flip classrooms is the best alternative to attract student learning. The data shown in Table 4 reveals that most respondents agreed that use of the MOOC learning strategy to flip classrooms assists students in problem solving skills.

Table 4: *Uses of MOOCs in Flipped Classroom*

The uses of MOOCs in flipped classroom	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
The MOOCs learning in flipped classroom strategy gives students more class time to practice problems of various topics	48 (53.3%)	32 (35.6%)	6 (6.67%)		4 (4.4%)
Student feel confident in learning after watching the videos at home and after coming to class to work on the problems with others,	45 (50%)	35 (38.8%)	4 (4.4%)	3 (3.3%)	3 (3.3%)

As shown in Table 4, while many of the respondents agreed on the value of MOOCS in the flipped classroom, there are some respondents 4 (4.4%) who are undecided and 6 (6.7%) who do not feel confident about learning by watching videos and working together in the classroom to solve problems. This suggests that there are some students who still prefer to learn using a traditional learning approach rather to learn through problem solving. Thus, lecturers should consider encouraging students to benefit from the participatory teaching approach and engage them in developing problem-solving skills.

Wang & Zhu (2019) noted similar findings in Belgium, and reported that students were much more interested and motivated in watching the videos and doing discussions and exercises in the classroom. Hence, the study by Cha & So (2020) asserted that flipped learning creates a conducive learning environment that engages students in a comprehensible process of solving real-world problems. In a flipped classroom, students were found to be more active in the classroom activities after watching the instructional videos at home (Cha & So, 2020). The use of the MOOCs learning strategy to flip classrooms increase instructors' interest in HLIs, and it shows a useful means of teaching for current and future instructors (Yaşar & Polat, 2021). Therefore, continuing teaching through a traditional approach not only limits students' ability to understand the concept of the lesson but also demotivates and disengages students in learning. Thus, use of the MOOCs learning strategy to flip classrooms makes the lesson active and enhances students' performance.

Challenges of Using MOOCs Learning Strategy

The data in in Table 5 shows that the students face infrastructural and pedagogical challenges when using MOOCs' learning strategies. The data shows that despite the challenges facing the MOOCs learning strategy, some instructors and students still use it to enhance teaching and learning.

Table 5: *Agreement of Using MOOCs*

Agreement of Using MOOCs	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
I do not have motivation while learning by using MOOCs learning strategy	17 (17.2%)	26 (26.3%)	32 (32.3%)	14 (14.1%)	10 (10.1%)
MOOCs learning strategy has negative impact on my academic performance	18 (18.2%)	19 (19.2%)	36 (36.4%)	14 (14.1%)	12 (12.1%)
Low of internet affects MOOCs learning strategy	57 (57%)	25 (25%)	8 (8%)	6 (6%)	4 (4%)
MOOCs learning strategy is challenges to some instructors	25 (24.8%)	44 (43.6%)	20 (19.8%)	8 (7.9%)	4 (3.9%)

Most of the respondents (82%) agreed that low Internet access affects the MOOCs learning strategy in HLIs. Therefore, HLIs management should consider increasing their budget on improving Internet services as the core function in MOOCs learning. Further, 68.4% of the respondents confirmed that the MOOCs learning strategy is challenging for some instructors, and HLIs should therefore consider conducting special programs to train their instructors on the use of MOOCs in teaching.

The findings of this study confirm that students were motivated in learning while using the MOOCs learning strategy to improve their academic performance. However, the majority of the students, noted challenges with the Internet connectivity that affects the usage of MOOCs in the teaching and learning process. Similarly, the study conducted by Zulkifli, Hamzah & Bashah (2020) in Malaysia found that students were motivated to use MOOCs but the Internet connectivity coverage was an obstacle to use MOOCs within the classroom. Additionally, the study by Abu-Shanab & Musleh (2018) in Qatar found that ICT infrastructure was the most challenging factor that affected student learning in higher learning institutions.

On the other hand, the study findings revealed that some instructors were facing pedagogical challenges while using MOOCs in learning. Correspondingly, the study by Chansanam et al. (2021) in Thailand found that pedagogical challenges of MOOCs included ineffective assessment and limited feedback, unengaged students in the learning activity, lack of peer or tutorial support, and limited basic knowledge of MOOCs. Li (2019) urged that other challenges of using MOOCs are the high rate of student dropout compared with the rate of students' enrolment and lack of effective evaluation of using MOOCs. This suggests that though MOOCs have many positive benefits for both instructors and students, there are infrastructural and pedagogical challenges that the University needs consider. To overcome these challenges the University should improve its budget for ICT infrastructure and provide more pedagogical and technological training to the instructors to improve their pedagogy and technological skills.

CONCLUSION

The study findings revealed that use of the MOOCs learning strategies has many benefits for students, including making learning effective, improving students learning abilities, and increasing

their eagerness to learn. The study also found that the MOOCs learning strategy is an effective means to improve students' performance, considering that the use of MOOCs increases interest in the teaching and learning process, provides a positive impact on students learning, and enhances students' understanding of the lesson. Further, the study found that MOOCs learning in a flipped classroom strategy gives students confidence in learning after watching the videos at home and working on the problems with others in the classroom. Despite this, MOOCs learning strategies in HLIs are facing some challenges that need to be considered. The most challenging issue in HLIs, specifically in developing countries, is the low Internet service. The Internet is a highly demanding service for both instructors and students to get teaching and learning resources. Other challenges noted include some instructors not being conversant with the MOOCs teaching approach, which leads some students not being motivated to learn using the MOOCs learning strategy and resulting in a negative impact on students' academic performance. Therefore, HLIs should adopt MOOCs learning strategies seriously to improve the teaching and learning processes and provide better student performance. HLIs should improve Internet services, and ensure instructors acquire the MOOCs learning strategies to provide quality teaching.

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Statements and Declarations
I hereby declare that the disclosed information is correct and that no other situation of real, potential or apparent conflict of interest is known to me.

Competing Interests
The authors declare that they have no competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability statement
The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy and ethical restrictions.

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