Journal of Computer Science and Technology Studies
ISSN: 2709-104X
DOI: 10.32996/jcsts
Journal Homepage: www.al-kindipublisher.com/index.php/jcsts

JCSTS
AL-KINDI CENTER FOR RESEARCH AND DEVELOPMENT

| RESEARCH ARTICLE

Massive Open Online Courses (MOOCs): Challenges and Recommendations of School Administrators in Selected Schools in the Philippines

Aahron M. Dinauanao[1]✉, Philip Joel D.R. Macugay[2], Richy Lloyd Tan[3], Iana Christine D.R. Macugay[4]
[1]*Director, Office of the Research Center, University of Southern Philippines Foundation, Philippines*
[2]*Director, Office of Institutional Planning and Development / Philanthropy & External Linkages, Alumni & International Relations, University of Southern Philippines Foundation, Philippines*
[3]*Faculty, College of Teacher Education, Arts and Sciences, University of Southern Philippines Foundation, Philippines*
[4]*Program Head, Manila Adventist College, Philippines*
Corresponding Author: Aahron M. Dinauanao, **E-mail**: adinauanao@uspf.edu.ph

| ABSTRACT
There are numerous challenges to implementing MOOCs from a school administrator's perspective, such as insufficient technological support, lack of faculty training, and institutional support. This prevents MOOCs from being incorporated into higher education structures because accessibility, instructional quality, and alignment with students' diverse learning needs are all impediments. The challenges were identified to improve the utilization of MOOCs at selected HEIs in the Philippines. The study used mixed-method research to collect data on 65 school administrators' difficulties implementing MOOCs from HEIs in Central Visayas, Philippines. In this case study, to collect the recommendations that could improve the MOOC implementation, these administrators used a three-part researcher-made questionnaire and a validated interview guide. The collected data were further analyzed using frequency, mean, standard deviations, Chi-square test of independence, ANOVA, and thematic analysis. The investigation found that the types of HEIs and the years of working as MOOC administrators significantly correlate with the difficulties they face while applying to MOOCs. MOOCs have been a game changer for learning, making content and experiences more accessible and flexible in new ways. Yet, launching MOOCs exceptionally well in any school requires some legwork. Results show that Central Visayas school administrators face obstacles in fully implementing MOOCs. The challenges range from inadequate technology infrastructure to inadequate faculty training and a general reluctance to adopt new pedagogical practices. To enhance the utilization of MOOCs, the researchers recommend that their action plan be implemented.

| KEYWORDS

MOOC, challenges, recommendations, mixed method, Philippines

| ARTICLE INFORMATION

ACCEPTED: 01 February 2025 **PUBLISHED:** 16 February 2025 **DOI:** 10.32996/jcsts.2025.7.1.16

1. Introduction

Massive Open Online Courses (MOOCs) transform education by offering inexpensive, flexible, and scalable learning possibilities for individuals worldwide. Introducing MOOCs into existing learning infrastructures seems to expose some obstacles to their adoption by school principals. These challenges include providing equitable access to technology, preserving leadership quality, ensuring that MOOC content matches curriculum, and addressing the differing levels of digital literacy among students and teachers. Besides, administrators often struggle to resist change from teachers who are used to conventional teaching and limitations in financing infrastructure and training.

MOOCs have great potential to improve education even with these limitations since they can offer students additional materials, create individualized learning opportunities, and connect learners worldwide. It is preventable, and school administrators can take a strategic approach. It positions building strong technological infrastructure, providing faculty with professional development to

Copyright: © 2025 the Author(s). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC-BY) 4.0 license (https://creativecommons.org/licenses/by/4.0/). Published by Al-Kindi Centre for Research and Development, London, United Kingdom.

integrate MOOCs into their teaching effectively, and clearly defining policies to ensure fit with institutional goals as potential ways forward. Stakeholders should also be involved in the decision-making process, and partnerships between institutes of higher education and MOOC providers should be maximized; all of this will impact feasible implementation. With solutions to these various problems, school administrators can use the MOOC's revolutionary power to create a bridge between conventional on-campus education and the demands of 21st-century students.

MOOCs in higher educational institutions (HEIs) present many challenges for school management. One major challenge is equitable access to necessary technological infrastructure, particularly a reliable internet connection and digital devices. Students in underprivileged or rural schools often face significant resource constraints, expanding the digital gulf among them. It also face the challenge of aligning their content with curriculum standards and learning goals. Because MOOCs are generic, customizing them to suit local or national needs can be tedious and lengthy. Moreover, the use of MOOCs in the classroom may be limited by differences in digital literacy among teachers and students, which poses an additional challenge for administrators.

Resistance to change is another significant barrier. However, teachers might be hesitant to use MOOCs for several reasons. They might not be familiar with the format or might be concerned about their place in a blended learning environment. Furthermore, engagement in self-paced and often asynchronous MOOCs may prove difficult for learners who may not possess the motivation or discipline necessary for independent learning. MOOCs cannot be used for free and cost money, which school administrators do not have to spare if they add expense programs in their schools. One of the many problems is the missing technological infrastructure. Limited access to reliable internet connectivity and essential digital tools prevalent at many schools, especially those in rural areas, make it challenging for administrators to promote and encourage MOOCs. Budget constraints to spending on computers, software, internet subscriptions, etc., make adopting extremely difficult.

Digital literacy is another critical challenge. In some schools, students are not familiar with the barricade codes of online classrooms. There is a reluctance to change, as traditional teaching methods are deeply embedded in the educational culture, and other stakeholders may be skeptical of the credibility and effectiveness of MOOCs compared to conventional methods. This is further compounded by the government's inability to provide coherent policies and guidelines. Without standards, administrators struggle to determine how MOOCs fit into what they already offer that meets standards. Another problem relates to content relevance, as most MOOC courses are developed for an international audience and are unsuitable for local contexts or language needs. Addressing these challenges requires a collective response involving investment in infrastructure, capacity-building initiatives, policy reforms, and localizing programs.

The growth of technology rapidly changed the educational world, and MOOCs emerged as a powerful device for accessible and flexible learning. Education is crucial to the economic and social benefits in the Philippines. Therefore, it is essential to study the implementation of MOOCs as it can alleviate the current education gaps. They provide access to a changing world. However, effective adoption is based on understanding the particular challenges and opportunities in the Philippine context. If pursued, an analysis of the implementation of MOOCs can offer invaluable insights into infrastructure requirements, the level of digital literacy, and how well course content and educational objectives are aligned with local contexts. In addition, such research can underscore systemic challenges, like technological barriers in rural areas, reticence to adopt new learning methods, and shortcomings in government policy. By recognizing problems with designated groups, the study can help the stakeholders make effective interventions by addressing solutions for more internet availability, teacher and administrator training, and culturally relevant MOOCs. Conducting studies on how MOOCs are utilized is crucial to making the integration of MOOCs in the Philippine education system fairer and more sustainable. MOOCs help learners in diverse settings, enable lifelong learning, and provide the skills for citizens to contribute to and thrive in the changing world.

2. Literature Review

This research is grounded on the Diffusion of Innovation Theory (Rogers, 1962) (DI), Self-Determination Theory (SDT) (Deci & Ryan, 1985), and the defining aspects of Lev Vygotsky's Zone of Proximal Development (ZPD) (1978). Moreover, the following local legal bases support it: The Free Internet Access in Public Places Act (Republic Act No. 10929), the Open Distance Learning Act (Republic Act No. 10650), and the Data Privacy Act of 2012 (Republic Act No. 10173).

In 1962, Everett Rogers published a theory about how innovation is disseminated in a community called the Diffusion of Innovations Theory (Roger et al., 2014). A barrier to change for administrators could be a lack of awareness, fear of uncertainty, or insufficient knowledge about MOOCs. Early adopters may have difficulty persuading laggards to embrace the new approach. Raise awareness and training for administrators and teachers. Share success stories and tangible benefits to drive adoption. Build a collaborative and learning-oriented support network (Fernández-Otoya et al., 2024; Ong & Conn, 2024; Sareen & Mandal, 2024).

One example is self-determination theory (SDT), first introduced by Deci and Ryan (1985) and which seeks to understand the intrinsic and extrinsic motivation behind the desire to engage (or not) in an activity or behavior (Grenier et al., 2024). It highlights three core psychological needs: autonomy, competence, and relatedness. When these needs are satisfied, people tend to feel more intrinsically motivated, perform better, and persist longer. Within MOOCs, SDT is a valuable lens for identifying challenges and formulating practical suggestions for enhancing learners' motivation, engagement, and retention (Feng et al., 2024; Badali et al., 2022).

Some of the challenges associated with the implementation of open courses can be analyzed with Vygotsky's (1978) central concept that refers to the Zone of Proximal Development (ZDP), as MOOCs are characterized by unique challenges and opportunities for fostering meaningful learning (Maspul, 2024). In the context of MOOCs, Applying ZPD requires you to think about the challenges of studying alone while demanding help in a large online environment (Dinh & Phuong, 2024).

In traditional classrooms, students could learn one-on-one, based on where they were in the learning continuum. However, one apparent and prominent deficiency in MOOCs, particularly with large enrollments (Pellas, 2024), is the absence of individual attention. The large class sizes and self-paced nature of many MOOCs mean that providing the scaffolding students need to work in their ZPD is difficult. At this point, some learners might be found at the potential development level where they cannot accomplish tasks individually and are deprived of the support they require. Building off past knowledge can be difficult, mainly when working on challenging or unfamiliar material. [5] Taking the 5 Rights framework, effective scaffolding is crucial to span the chasm between what learners can achieve on their own and what they can accomplish with the help of others (Cai et al., 2024). In MOOCs generally, especially those with asynchronous formats, there is little chance for real-time, personalized feedback or interactive assistance (Zobel & Meinel, 2022).

Serafica et al. (2023). Republic Act No. 10929 (Free Internet Access in Public Places Act) provides free Internet access in public places, such as schools, libraries, and government offices. Due to their potential, this is critical to rolling out MOOCs, and free Internet access at schools should be expedited and ensured for these open-access courses to be implemented (IP, 2024). It aims to provide and promote open and distance learning in tertiary and graduate education and basic education and develop the learners' educational capabilities through flexible learning (Chao, 2021). MOOCs such as Open Distance Learning– MOE may provide a distance learning complement to formal education systems among open education learning MOOCs for partnerships with MOOC providers of ODL initiatives (Sabour, 2024). The Data Privacy Act of 2012 (Republic Act No. 10173) governs the protection of personal data in the digital space (Servado, 2024). Administrators must receive data privacy training to protect student data and ensure MOOCs comply with privacy policies (Jiang et al., 2023).

According to Martin and Bolliger's study (2018), the lack of reliable Internet connection and old devices prevent the practical usage of MOOCs. The study's findings can help inform school administrators looking to improve engagement in online courses. MOOCs are online teaching programs that can serve thousands of students and cost nothing. There are bibliometric and systematic reviews of the research on MOOCs to learn what can be learned from the innovation. These results indicate a growing interest in academic work about MOOCs that reflects a sustained concern with MOOC dropout rates, with solutions still sought. Research shows that engaging and participation opportunities must be multiplied. And it increasingly looks like they have tried to profit (monetize) available MOOCs from HEIs to smaller numbers of paying students: (not so) massive, not open access: things like credit and certification have registration fees and paywalls (Billsberry & Alony, 2024).

Yuan et al. (2014) aimed to assist decision-makers in HEIs in developing a clearer understanding of the MOOC phenomenon and trends towards greater openness in HE and consider the implications for their institutions. MOOCs are characterized by situating them among the broader landscape of open education, online learning, and the transformations underway in higher education at a time of globalization of education and budget constraints. Administrators often lack the digital skills to operate and optimize MOOC platforms.

Huacui et al. (2024) examine the impact of success factors, particularly motivation and course quality, on MOOC retention intention. Apart from the psychological and quality parameters, the study maps out the needs of the student's motivation in terms of needs, interests, course system, content, and service quality. The positive effect of motivational factors and quality issues on students' behavior was revealed in the study. Academic and professional needs and personal interests also impacted retention behavior significantly. Moreover, course content and service quality significantly influenced students' perseverance behavior. When designing courses and systems, allowing students to set course and system content as they see fit is critical. It requires timely problem-solving attitudes from service providers to ensure student retention.

Growing technology accessibility in higher education has provided online learning platforms with additional opportunities. However, the issue of dropout rates in online higher education remains a significant challenge. Amid this fluid scenario, student dropout presents a nuanced challenge that merits thoughtful exploration. The study by Rahmani et al. (2024) outlines fundamental dropout contributors, including course quality, academic preparation, student satisfaction, learner motivation, system attributes, and support services. In comparison, health issues, financial burdens, issues with technology, fatigue related to screens, isolation, and academic workload are considerable barriers among online learners. These insights provide a comprehensive understanding of dropout dynamics, informing the design of targeted interventions and strategies to improve the quality and impact of online education—high dropout rates due to insufficient personalized learning pathways and low engagement.

Research has been conducted on the high extent of attrition and low certification rate in MOOCs. Previous researchers have concentrated on dropout prediction using behavioral features like clickstream patterns, student confusion, and social interactions. However, Gitinabard et al. In (2018), authors have merged student logs with forum information. Relying on busy professionals to find time to complete the work leads to low completion rates. In analyzing learners' motivational and behavioral patterns, Kizilcec and Schneider (2015) speculate on learners' competing needs for gratifying engagement with courses. In response to this demand, they suggest several design directions, such as using virtual social spaces independent of a course, improved support for small local clusters of learners, and modularization, improving the accessibility and organization of course materials. Accordingly, motivations give a perspective for understanding online learners and designing online courses to support their needs better. This duality of responsibilities presents a challenge for administrators who wish to promote MOOC participation without demanding too much time away from their professional duties.

MOOCs are a colloquial term for online learning that has gained popularity with the e-learning community worldwide but continues to have low completion rates. The study of Azhar et al. (2024) examines the dropout phenomenon in MOOCs using a qualitative case study based on a program delivered in Pakistan. It seeks to analyze the reasons behind the dropout of learners in MOOCs by determining the factors affecting the learners' decision-making. Interview responses were grouped into three major areas: (i) lack of motivation, (ii) perception of course content, and (iii) inability to time management. Among these themes, several factors contributing to course dropout rates were identified, such as perceived rewards, difficulties in comprehension, academic and family commitments, and course duration.

Many students can access most course content online and do the courses at their own pace while communicating with their peers and instructors asynchronously online. However, after the excitement over MOOCs wore off, statistics indicated that many students dropped out of those online courses. Harju et al. illustrate the high dropout rate of students and emphasize the impact of the MOOCs' interaction possibilities on students' dropout rate. The lack of access to reliable Internet and necessary devices also increases dropout rates. MOOCs have surged in recent years as a revolution in education, providing flexible, accessible, and often affordable learning experiences across various subjects. Omar et al. (2024) found that exposure to MOOCs and other professional development opportunities to boost their career was limited for most learners. Traditional staff continuous training methods are still preferred; seminars, workshops, and conferences retraining methods were used extensively. However, individual staff did not prioritize the matter as they should have. Management provided the funds for continuous training, offering partial support for the study; nevertheless, there was no direct involvement in the planning process, nor was a serious assessment made to determine the outcome of continuous staff training toward achieving the organization's goal. The findings of Huang et al.'s study (2024) show that technology-enabled teacher professional development programs could be leveraged to develop teachers' knowledge and skills necessary for quality teaching during the pandemic and to develop environments that foster teacher-to-teacher active learning and collaboration. Use cases also need considerable tech work to enable expert touch , feedback, and reflections.

Calleros et al. (2024) are among the significant challenges identified, including limited access to ICTs, a lack of digital skills, and socioeconomic disparities. They also spot opportunities by creating digital literacy programs and fostering stakeholder collaboration and inclusive policies. The conclusions emphasize the need to address the digital divide in education and call for the definition of global policies and strategies that consider both technological barriers and socioeconomic inequalities. Integrating ICTs into an education system, when done correctly, Results in a more inclusive and tech-powered education system.

The incorporation of MOOCs in HEIs is a significant change in the landscape of how education is delivered and received. While the potential impact of MOOCs is immense, the adoption process is complex. The results of the research of Budiarti et al. (2024) highlight the importance of perceived ease of use in the usability of platforms, hence its relevance for the case study platforms, whose very issue was a lack of usability. Potential traders (adopters) cite poor government support and marketing campaigns that hinder access to the platform. On the other hand, non-adopters point out the need for non-digital education and emphasize the government support and priorities that limit MOOC implementation.

In an exploratory study, Cheng (2024) suggested a model to understand if gamification and personalization as environmental stimuli to learners' learning engagement could contribute to learners' learning persistence in MOOCs and, subsequently, valid learning contexts in MOOCs. This study identified that the gamification and personalization perceived by learners in MOOCs positively influenced cognitive and emotional aspects of learning experiences based on MOOCs. The trend of MOOCs has seen massive growth, which is an evolution of online education. Even with this proliferation, a significant gap in understanding the MOOC-making process remained. Haugsbakken's (2024) study explores learning design frameworks and course performance evaluation. But it looks very seldom on how complicated and complex MOOC making is. This limited exploration means that the academic world has only a partial view of the complete MOOC-making process.

Several pedagogical strategies, including active learning and formative assessment strategies, would emerge as integral parts of the teaching-learning process for practical, real-world-focused, engaging education. For this study's young MOOC pedagogy purpose, we undertook a dedicated project to address and investigate the above research gap and its outcome in developing specific pedagogies. In the end, feedback from participants was overwhelmingly positive. They reported high satisfaction, substantial perceived learning outcomes, and strong engagement with the learning materials. Most of all, the portfolio assessment and quiz integration were well received. However, student interactions were not beneficial for learning outcomes. For the researchers to better understand the struggles of school administrators on the use of MOOCs and to suggest how to properly implement that system in their respective HEIs in Central Visayas, Philippines, these theories, legal bases, related literature, and studies are needed.

3. Objectives of the Study

This study determined school administrators' challenges in utilizing MOOCs and recommends improving its implementation among selected HEIs in the Philippines. It specifically answered the: 1) Profile of the respondents; 2) Level of challenges the respondents encounter in the implementation of MOOCs; 3) Test of significance of the relationships; 4) Test of significance of the difference when grouped by its profiles; 5) Recommendations of the respondents to better implement the MOOCs.

4. Methodology

This section presents the research design, environment, respondents, instrument, data analysis, privacy, and ethical considerations.

4.1 Design

This study employed mixed-method research to gather data on the challenges of school administrators in implementing MOOCs among HEIs in Central Visayas, Philippines. Furthermore, it gathers qualitative data on the respondents' recommendations for improving the implementation of MOOCs.

4.2 Environment and Respondents

The study was conducted in local, private, and state universities in Central Visayas, Philippines. These HEIs offer different course offerings, such as teacher education, technology, business, nursing, engineering, and law studies. The researchers chose the study samples from school settings across the region. The target respondents were school administrators with direct knowledge of implementing MOOCs. Using purposive sampling, the researchers employed the probability sampling technique to identify the 65 respondents.

4.3 Instrument

This study utilized a three-part questionnaire. The first part gathers the demographic profile of the respondents. The second part is a 15-item researcher-made 4-Likert questionnaire on the respondents' awareness of MOOCs. The third part is a 15-item researcher-made 4-Likert questionnaire on the respondents' utilization of MOOCs. Part 1 of the questionnaire gathers the teacher respondents' profiles, including their age, gender, highest educational attainment, and years of teaching. It also gathers the student respondents' profiles, such as age, gender, and course enrollment. In this section, the students were advised to write their information in the space provided. Part 2 of the questionnaire is a 20-item researcher-made 4-Likert questionnaire that gathers data on the respondents' challenges in implementing MOOC. This questionnaire underwent content validity and pilot-testing activity, resulting in a Cronbach alpha of 0.93 (Highly Reliable). These challenges are categorized into a) Utilization, b) Completion Rate, c) Course Content, and d) Assessment. The respondents were advised to rate the items using the 4-Likert scale: 4 points for Strongly agree, 3 points for Agree, 2 points for Disagree, and 1 point for Strongly disagree. Part 3 collects their qualitative responses to these suggestions to improve MOOC implementation. Three specialists, including an IT specialist, a MOOC administrator, and an academician, validated the interview questions. Their feedback was also helpful in refining the interview guide before conducting the in-depth interview.

4.4 Data Analysis

The researchers used frequency, simple percentage, mean, and standard deviation to treat the gathered respondent profiles. Weighted mean and standard deviation were used to measure the respondents' challenges in implementing MOOCs. The Chi-square test of independence was used to treat the significant relationships between the respondents' profiles and their challenges in implementing MOOCs. ANOVA was used to test the significance of the difference when grouped by its profiles. Also, the researchers used Thematic Analysis of the qualitative data in their recommendations to improve the implementation of MOOCs.

5. Results and Discussion

5.1 Profile of the Respondents

Table 1 presents the profile of the respondents.

Table 1
Profile of the Respondents
(n = 65)

Profiles	Frequency	Percentage
A. Type of HEIs		
Local universities and colleges	7	10.77
State universities and colleges	11	16.92
Private Schools	47	72.31
B. Gender		
Female	26	40.00
Male	39	60.00
C. Years of Working as Administrators		
1 - 3	20	30.77
4 - 6	12	18.46
7 - 9	12	18.46
10 years and above	21	32.31
Mean : 7.74		
StDev : 5.60		

From the table, it can be shown that most of them were the school administrators of private schools in Central Visayas 47 respondents (72.31%) were male (39, 60.00%), and years of work experience were 10 years present. The data suggest that the potential of school administrators, particularly those with 10 or more years of experience in private schools, can play a critical role in determining the success of the implementation and sustainability of MOOCs at their respective institutions. With deep expertise in the sector, they can advise on how to align MOOCs with a school's goals best, whether to extend access to high-quality education, supplement curriculum material, or prepare advanced learners.

With a decade or more of experience in leadership roles, these administrators likely have strong organizational decision-making skills that allow them to set up and adapt credible MOOC platforms to accommodate students' differing needs (Karimi & Khawaja, 2024; Salama & Hinton, 2023). Their understanding of resource allocation and external organizational relationships opens the doors to partnerships with major MOOC providers, ensuring students stay on pace with global educational trends (Murray-Johnson & Dewsbury, 2024). Nonetheless, due to their classicist background, they may find it difficult to adjust to online courses' innovative and technological evolution (Dritsas & Trigka, 2025). Years of discomfort with in-person learning models could make it harder to embrace innovative digital tools, and the system will need to work hard to adopt new pedagogical methods (Adera, 2025).

Moreover, the dominance of male leadership may restrict diverse viewpoints when considering inclusive and culturally responsive MOOC content. To maximize the use of MOOCs, these administrators must advocate for continuous professional development, promote teacher training, and encourage intercoordination for full integration of MOOCs into the school's academic ecosystem (Gilmore & Nguyen, 2024; Zakaria et al., 2024). The study of Hakimi et al. (2023) connects institutional support and innovative practice, specifically the role of institutional culture and leadership in promoting innovative (including MOOC) teaching practice. Experienced administrators can foster an environment that encourages faculty engagement with MOOCs by providing the correct support structures.

As Lee and de Vries (2019) note, one key administrative strategy for the successful implementation of MOOCs is acknowledging and incentivizing previously unrecognized faculty efforts to adopt online education. These strategies are better developed and implemented by experienced administrators. Finally, Srinara (2024) highlights the role of leadership in embedding MOOCs within the university experience, proposing that experienced administrators play a crucial role in addressing challenges linked to the adoption of MOOCs.

5.2 Respondents' Challenges in the Implementation of MOOCs

Table 2 presents the results of the challenges of school administrators in implementing MOOCs.

Table 2
Challenges of School Administrators in the Implementation of MOOCs

#	Challenges	Mean	StDev	Interpretation
A.	**Utilization**			
1.	My school lacks the basic technological infrastructure to implement MOOCs effectively.	3.06	0.81	Agree
2.	School staff shows insufficient digital literacy, and this poses a significant challenge to democrats for the usage of MOOCs.	3.29	0.72	Agree
3.	These barriers stem from the lack of clear policies or guidance around how MOOCs fit into the educational landscape.	2.55	0.94	Agree
4.	MOOCs have introduced an entirely new way of learning, but teachers and students are unwilling to trade the process for it.	1.74	1.19	Strongly disagree
5.	MOOC content usually does not match the specific needs of my school or educational system.	2.95	0.86	Agree
	Aggregate :	**2.72**	**0.90**	**Agree**
B.	**Completion Rate**			
1.	Low MOOC completion rates can be linked to a lack of motivation in teachers and students.	2.94	0.77	Agree
2.	Withdrawing classroom obligations by participating in MOOCs results in high dropout rates.	3.20	0.75	Agree
3.	Because of this structure and content, MOOCs frequently do not maintain participants' interest, featuring low completion rates.	2.54	0.92	Agree
4.	Completing a MOOC is more difficult due to insufficient supporting learners throughout the process and providing dedicated mentorship support.	1.89	1.21	Disagree
5.	In the context of MOOC, the content is far from the personal needs/goals of the participants, hence they lack the motivation even to complete it.	2.91	0.88	Agree
	Aggregate :	**2.70**	**0.91**	**Agree**
C.	**Course Content**			
1.	The school's curriculum and educational objectives are not met by MOOC course content.	1.72	1.21	Strongly disagree
2.	The content of MOOCs is often not relevant to the cultural or contextual needs of my school.	3.37	1.07	Strongly agree
3.	MOOC course content is either too advanced or too basic for intended participants.	3.34	0.91	Strongly agree
4.	Interactive and engaging elements are not infused into the MOOC course material, making it ineffective for learners.	3.09	0.86	Agree
5.	My school cannot utilize MOOC course content because of language barriers and lack of accessibility options.	1.71	1.22	Strongly disagree
	Aggregate :	**2.65**	**1.05**	**Agree**
D.	**Assessment**			
1.	The MOOC assessments can easily misalign with what my school wanted me to learn.	2.80	0.91	Agree

2.	The evaluations offered in MOOCs do not adequately assess participants' knowledge and skills.	3.29	0.49	Strongly agree
3.	Making assessment fair and scalable to a mass scale of people is quite difficult in MOOC.	2.55	1.02	Agree
4.	MOOC assessment feedback is not enough to help participants improve in a meaningful way.	3.51	0.50	Strongly agree
5.	A major challenge is the integration of MOOC assessment results into existing school evaluation systems.	3.62	0.49	Strongly agree
	Aggregate :	**3.15**	**0.68**	**Agree**
	Overall Aggregate :	**2.80**	**0.89**	**Agree**

Legend:
1.00-1.74 Strongly Disagree [SD]; 1.75-2.49 Disagree [D]; 2.50-3.24 Agree [A]; 3.25-4.00 Strongly Agree [SA]

In this study, the item "School staff shows insufficient digital literacy, and this poses a serious challenge to democrats for the usage of MOOCs, and the respondents' challenges regarding Utilization have got the highest mean of 3.29 (Strongly agree) with a standard deviation of 0.72. This implies that the lack of digital literacy skills is a significant hurdle to school staff's improvised uptake of MOOCs, which affects democratized access to education. Digital literacy, before MOOC even starts, helps students navigate MOOC platforms, create engaging content, and guide them in a student-centered, scalable environment. If employees do not have these competencies, it is difficult for the institute to integrate MOOCs into its academic structure, which restricts its ability to provide equitable learning opportunities.

Yadav (2025) asserts that addressing this issue demands targeted professional development initiatives to equip staff with digital competencies. By improving digital literacy, schools can freely adopt MOOCs and encourage inclusive and equitable education. School administrators without the requisite skills find it difficult to adopt MOOCs Kaur (2023) Kaur (2023), thus making it still more difficult for MOOCs to be integrated into educational settings. Additionally, although MOOCs can provide scalable solutions for teacher professional development, studies have shown that they are only effective when the participants are digitally competent. Kumar et al. (2024) discovered that teachers with relatively few digital skills had difficulty engaging with MOOC course content, diminishing the perceived benefits of such programs.

In the challenges faced by the respondents concerning the Completion Rate, the study indicated the highest mean of 3.20 (Agree), with a standard deviation of 0.75, for the statement "Withdrawing classroom obligations by participating in MOOCs results in high dropout rates." These MOOC data indicate that people enrolling in MOOCs that require them to detach from traditional classroom commitments experience elevated dropout rates, making it a problem for educators and learners alike. MOOCs require a level of self-discipline, motivation, and time management skills. Participants who are noble enough to go beyond the routine teaching tasks [they are supposed to] practice, switching to normal classroom mode, struggle to continue or respect the requirements of their course and is not enough for their facilitation. On the flip side, students are also less likely to benefit from the support systems available to them in a traditional classroom, like physical presence, instant feedback, and the possibility of tailored attention. Without face-to-face interaction, for those new to online learning independently, this can result in disengagement. Moreover, MOOCs lack admission prerequisites, leading to diverse levels of commitment among students, which drives down the completion rate (Akkilinc, 2024).

For institutions (Azimi et al. (2023), the effectiveness of MOOCs in promoting real learning is being questioned. These challenges point towards the need for designing structured programs that leverage MOOCs while pairing them with in-person support and other resources that help participants juggle multiple life responsibilities. Yan and Pourdavood (2024) highlight how the lack of face-to-face interaction and instantaneous feedback in the context of MOOCs may lead to isolation and contribute to student disengagement and eventual dropout. Further, the independence of MOOCs demands that learners have good self-regulation and time management skills, the lack of which may lead to procrastination and non-completion.

In the respondents' challenges concerning Course Content, the study reveals that "The content of MOOCs is often not relevant to the cultural or contextual needs of my school" had the highest mean of 3.37 (Strongly agree) and standard deviation of 1.07. This can be problematic for adoption because, as data suggests, the content of the MOOCs is not designed with the cultural or contextual needs of specific schools in mind. Generic, globally designed courses may not consider local institutions' unique social, cultural, or educational contexts. When these aspects are misaligned, this can negatively impact student engagement as students find it challenging to connect with examples, teaching styles, or perspectives that are not familiar to them.

For schools, integrating such content without contextual adaptation risks marginalization of cultural identities and the failure to meet specific academic goals (Maphosa & Maphosa, 2023). Tang et al. (2024) suggest that teachers might also find using MOOCs to supplement their curricula difficult. In response, schools will need to ensure that only MOOCs with culturally relevant materials and examples are chosen or designed, provided the courses are in tune with learners' backgrounds and aligned with local educational goals.

In the Assessment challenges of respondents, as per the study, the statement "A major challenge is integrating MOOC assessment results into existing school evaluation systems" got the highest mean of 3.62 (Strongly agree) with a standard deviation of 0.49. Integrating the results of any MOOC assessment into existing school evaluation systems has many data implications, as suggested by the available data. First, it needs to find a way to align MOOCs' grading standards and formats with traditional school assessments — which can vary widely in their structures and what they measure. According to Meinel et al. (2024), the integration could identify variances in online-versus-in-class performance that would prompt questions of fairness and consistency. Systems will also be needed to track student progress across the reliability and credibility systems. Moreover, Anson (2024) added that MOOC-based student skills or knowledge gaps suggest school curricular adjustments. The rise of MOOCs also requires educators to think about how they complement, augment, or contradict traditional comprehensive exams, which have meager validity for 21st-century learning targets — meaning there is still work to be done to evolve assessment systems as both the status quo of education delivery and content delivery change rapidly.

5.3 Test of Significance of the Relationships Between the Profile of the Respondent Groups and their Level of Awareness of MOOC

The study hypothesized that the respondents' challenges in implementing MOOCs correlate with their profiles. Table 3 presents the results.

Table 3
Relationship Between the Profile of the Respondent Groups and their Challenges in the Implementation of MOOC

Respondents' Challenges in the Implementation of MOOCs and	Chi-Square	df	p-value	Significance	Result
Types of HEIs	9.897	4	0.042	Significant	Ho rejected
Gender	1.068	2	0.586	Not significant	Ho accepted
Years of Working as Administrators	14.161	6	0.028	Significant	Ho rejected

Note from the table that the two variables, namely the type of HEI where the school administrators work and the number of years working as administrators, have significant relationships with the challenges they encounter in implementing MOOCs. The computed p-values for these two variables are 0.042 and 0.028, respectively. The p-values also are much smaller than the critical value of 0.05, which allows us to reject the null hypothesis. The data suggest that the types of HEIs school administrators work in and their years of experience administering those positions can reveal a lot about the problems encountered in the MOOC implementation process. Larger, resource-rich universities typically have infrastructure and support systems in place to integrate online learning, which may present fewer challenges for administrators compared to their counterparts at smaller institutions. On the other hand, smaller or less-resourced HEI administrators may face tremendous barriers because of technological access issues or organizational inertia. Furthermore, the administrator's experience would affect how effectively the challenges of MOOC implementation is addressed. More seasoned candidates may be better able to navigate bureaucratic hurdles or handle pushback from faculty. At the same time, newer administrators may not fully grasp the institutional dynamics or buy-in for MOOCs. Data can shows how experience and institutional type affect the barriers to adopting MOOCs.

The study by Liu et al. (2019) investigates the differences in challenges that administrators of public and private HEIs face regarding the implementation of MOOCs. It provides a more detailed examination of the types of institutional success and challenges that characterize MOOC participation and drive MOOC adoption (public, private, research, teaching, etc.). Joshi and Khatiwada (2024) determine that administrators in public HEIs who need funding face comparatively higher barriers to technology infrastructure and faculty resistance. In contrast, private and research-oriented institutions often boast more excellent resources and institutional support that simplify implementation. This study (Aubakirova et al., 2024; Van Luong et al., 2024; Zakaria et al., 2024) focuses on whether the number of years school administrators have been working influences their ability to manage the implementation of MOOCs and different online learning initiatives in HEIs. It reflects on how experience shapes your decision-making, what to do with faculty resistance, and how to negotiate institutional politics. This study maintains that more experienced administrators can

resolve logistical and administrative issues more effectively, facilitate change, and acquire needed resources. Less experienced administrators have more hurdles to overcome resistance to MOOCs and coordinate with faculty.

5.4 Test of Significance of the Difference in the Respondents' Challenges in the Implementation of MOOCs When Grouped by its Profiles

The study hypothesized that the respondents' challenges in implementing MOOCs differ when grouped by their profiles. Table 4 presents the results.

Table 4
Difference in the Respondents' Level of MOOC Utilization When Grouped by its Profiles

Respondents' Challenges in the Implementation of MOOCs When Grouped by	F-value	p-value	Significance	Result
Types of HEIs	0.39	0.68	Not significant	Ho accepted
Gender	0.04	0.843	Not significant	Ho accepted
Years of Working as Administrators	0.86	0.610	Not significant	Ho accepted

The study shows that the respondents' challenges in implementing MOOCs do not differ when grouped by their profiles. The computed p-values are higher than their critical value of 0.05, which leads to the acceptance of the null hypothesis. The data reveal that school administrators' challenges in implementing MOOCs do not differ when grouped by their profiles. It suggests that the barriers to successful MOOC adoption may be universal across different contexts. This implies that the factors influencing the challenges are likely systemic or related to broader educational trends rather than specific to the administrator's background or the type of institution. The challenges could stem from common issues such as resistance to change, insufficient technological infrastructure, or a lack of faculty training and support, which affect institutions regardless of size or funding. This finding could prompt a reevaluation of MOOC implementation strategies, advocating for system-wide solutions, such as standardized professional development programs for administrators and faculty, investment in technology, and institutional culture shifts that support online learning. Addressing these shared challenges may improve the success of MOOCs in diverse educational environments.

5.1 Respondents' Recommendations to Improve the Implementation of MOOCs

MOOCs have changed the learning game, increasing accessibility and flexibility in education. However, rolling out MOOCs exceptionally well in any school entails much planning. The thematic analysis drew insights from the findings and developed recommendations for enhancing, integrating, and impacting MOOCs in the educational setting.

Improving Infrastructure and Accessibility. The MOOC technology infrastructure and its accessibility remains an area of concern in the research locales. Authorities should address the needs of students and ensure adequate Internet, computers, and a space to go online to study. Unequal access to technology has deprived students of low-income households. Working with a government or private organization can help find funds for hardware and Internet use. In addition, interactive and engaging content can make learning enjoyable for students. Easy-to-use MOOC platforms ensure that students and teachers stay engaged with the content. Course material can also be made available offline, helping students in areas with no or low connectivity.

Professional Development for Teachers. Teachers are central to the success of MOOC implementations. As identified through thematic analysis, one barrier to effective MOOC integration is insufficient teacher training. To make MOOCs more useful, school administrators should conduct workshops and professional development programs to train teachers on using MOOC platforms, combine online content with traditional curricula, and mentor students in self-paced learning. This participation gives the MOOCs relevance to curriculum goals and a sense of ownership of the process. Ongoing support and professional learning communities can help teachers share best practices and address challenges in collaboration.

Tailoring and Directing toward the Curriculum. Contextual relevance is a common theme in MOOC implementation. MOOCs should be checked in terms of schools' curricula and local learning objectives. They may work with MOOC providers to modify course materials to reflect locally relevant examples and culturally appropriate content. In addition, presenting students with a clear rationale for how MOOC offerings relate to classroom learning and/or skill acquisition opportunities can go a long way toward positioning MOOCs as a worthwhile investment of their time.

Fostering Student Engagement and Motivation. Thematic analysis shows that maintaining student motivation in MOOCs was an issue. To encourage active participation, administrators will also promote activities within MOOCs, such as quizzes, discussion

forums, and group projects that require the learner to work with the Gamification, including leaderboards and badges, which can help provide additional student motivation. Teacher or senior-student mentoring programs, in which teachers or upper-level students walk learners through MOOCs, can mitigate the isolation of online learning. Furthermore, interspersing local or virtual group discussion sessions around MOOC topics fosters the formation of a community among learners.

Evaluation and Feedback Mechanisms. The success of MOOCs requires continual monitoring and feedback systems. The administration or faculty should establish systems that monitor student progress, completion, and learning outcomes. MOOC platforms may feature tools that help with analytics and help get crucial and actionable insights. Collecting feedback from students and teachers offers insight into challenges to participation and helps with continuous improvement efforts. Providing this feedback can further assist administrators in revising implementation strategies and identifying courses to be delivered.

6. Conclusion and Recommendations

Many school administrators in HEIs in the Philippines are experiencing this challenge regarding how MOOCs are fully adapted. These encompass limited technological infrastructure, lack of faculty training, and reluctance to embrace new pedagogical practices. This gap will require bolstering institutional support via investment in digital tooling and connective tissue. Other essentials include regular professional development for educators and an innovation culture. The future of MOOCs in HEIs is poised for transformation as they work to overcome the unique challenges outlined above to capitalize on the benefits that MOOCs will bring in terms of accessibility, instructional quality, and pedagogical flexibility to meet the needs of students in a globally connected educational system. The researchers recommend implementing, monitoring, and evaluating the proposed learning enhancement plan.

Study Limitations and Future Research

This study is limited to 65 out of 1,977 HEIs in the Philippines as of 2024. This number of HEIs gives a smaller percentage (3.29%) that offers a more evident educational landscape if the number of HEIs increases in participating in the study regarding the challenges of school administrators in implementing MOOCs. Nevertheless, some HEIs' technological infrastructures are still facing issues with adopting MOOCs due to higher management's lack of administrative support. Some HEIs did not participate since their schools did not adapt to the demand of distance education. The researchers strongly recommend that these salient findings of the study be presented to the Philippines' Commission on Higher Education for proper action to improve the delivery of program offerings of HEIs in the Philippines. Future researchers may conduct similar regional studies to support these preliminary findings.

Funding: This research received no external funding.
Conflicts of Interest: The authors declare no conflict of interest.
ORCID iD (if any): https://orcid.org/0000-0002-1183-1331, https://orcid.org/0000-0003-4664-2335, https://orcid.org/0000-0002-0777-1778, https://orcid.org/0000-0003-1254-2993

References

[1] Adera, N. (2025). Innovative learning spaces and blended learning: Quest for 21st-century competency teaching and learning approaches. *Creating Dynamic Space in Higher Education: Modern Shifts in Policy, Competencies, and Governance*, 139-174. https://doi.org/10.4018/979-8-3693-6930-2.ch006

[2] Akkilinc, F. R. (2024). *Online learning and traditional face-to-face learning: A comparison exploring learning and learning experiences among students in the HE of the Eastern Mediterranean* (Doctoral dissertation, University of Liverpool). https://doi.org/10.17638/03180546

[3] AlQaidoom, H., & Shah, A. (2020). Digital literacy of educators and their attitude towards MOOC platform in Arab world. In *2020 IEEE 7th International Conference on Engineering Technologies and Applied Sciences (ICETAS)* (pp. 1-6). IEEE. https://doi.org/10.1109/ICETAS51660.2020.9484170

[4] Anson, A. M. (2024). Beyond the classroom: MOOCs and the evolution of lifelong learning. *Journal of Computer Science Application and Engineering (JOSAPEN)*, *2*(1), 6-10. https://doi.org/10.70356/josapen.v2i1.22

[5] Aubakirova, S., Kozhamzharova, M., Akhmetova, G., Artykbayeva, G., Iskakova, Z., & Zhayabayeva, R. (2024). The role of Massive Open Online Courses in transforming academic education and university experience. *Education and Information Technologies*, *29*(1), 991-1011. https://doi.org/10.1007/s10639-023-12291-6

[6] zhar, K. A., Iqbal, N., Shah, Z., & Ahmed, H. (2024). Understanding high dropout rates in MOOCs–a qualitative case study from Pakistan. *Innovations in Education and Teaching International*, *61*(4), 764-778. https://doi.org/10.1080/14703297.2023.2200753

[7] Azimi, I., Ebrahemi, M., & Merzaee, M. J. (2024). Exploring the impact of Massive Open Online Courses (MOOCs) on higher education in Afghanistan: Opportunities, challenges, and policy implications. *Journal of Education Research*, *5*(1), 957-968. https://doi.org/10.37985/jer.v5i1.993

[8] Badali, M., Hatami, J., Banihashem, S. K., Rahimi, E., Noroozi, O., & Eslami, Z. (2022). The role of motivation in MOOCs' retention rates: A systematic literature review. *Research and Practice in Technology Enhanced Learning*, *17*(1), 5. https://doi.org/10.1186/s41039-022-00181-3

[9] Billsberry, J., & Alony, I. (2024). The MOOC post-mortem: Bibliometric and systematic analyses of research on massive open online courses (MOOCs), 2009 to 2022. *Journal of Management Education*, *48*(4), 634-670. https://doi.org/10.1177/10525629231190840

[10] Budiarti, B., Sensuse, D. I., Santoso, H. B., Hidayat, D. S., & Purwaningsih, E. H. (2024). Investigating the drivers and barriers to MOOC adoption by course and training institutions. *Eduvest-Journal of Universal Studies*, *4*(7), 5818-5837. https://doi.org/10.59188/eduvest.v4i7.1229

[11] Cai, L., Msafiri, M. M., & Kangwa, D. (2024). Exploring the impact of integrating AI tools in higher education using the Zone of Proximal Development. *Education and Information Technologies*, 1-74. https://doi.org/10.1007/s10639-024-13112-0

[12] Calleros, C. B. G., García, J. G., & Calleros, J. M. G. (2024). Addressing the Digital Divide with Educational Systems in Mexico: Challenges and Opportunities. *From Digital Divide to Digital Inclusion: Challenges, Perspectives and Trends in the Development of Digital Competences*, 347-375. https://doi.org/10.1007/978-981-99-7645-4_16

[13] Chao, R. Y. (2021). Higher education in the Philippines. *International Handbook on Education in South East Asia*, 1-28. https://doi.org/10.1007/978-981-16-8136-3_7-1

[14] Cheng, Y. M. (2024). What makes learners enhance learning outcomes in MOOCs? Exploring the roles of gamification and personalization. *Interactive Technology and Smart Education*, *21*(2), 308-330. https://doi.org/10.1108/ITSE-05-2023-0097

[15] Dinh, T. C., & Phuong, H. Y. (2024). EFL student learning experiences in MOOCs: Analysis through the lenses of sociocultural theory and community of inquiry. *Available at SSRN 4867040*.

[16] Dritsas, E., & Trigka, M. (2025). Methodological and technological advancements in e-learning. *Information*, *16*(1), 56. https://doi.org/10.3390/info16010056

[17] Feng, L., Shen, X., Xie, Z., & Yan, X. (2024). How gamification-based course drives online learners' engagement: Focusing on intrinsic motivation and effect mechanism. *Education and Information Technologies*, 1-35. https://doi.org/10.1007/s10639-024-13242-5

[18] Fernández-Otoya, F., Cabero-Almenara, J., Pérez-Postigo, G., Bravo, J., Alcázar-Holguin, M. A., & Vilca-Rodríguez, M. (2024). Digital and information literacy in basic-education teachers: A systematic literature review. *Education Sciences*, *14*(2), 127. https://doi.org/10.3390/educsci14020127

[19] Gilmore, D. M., & Nguyen, C. (Eds.). (2024). *Partnering with Online Program Managers for Distance Education: Approaches to Policy, Quality, and Leadership*. Taylor & Francis. https://tinyurl.com/ue4dbjdd

[20] Gitinabard, N., Khoshnevisan, F., Lynch, C. F., & Wang, E. Y. (2018). Your actions or your associates? Predicting certification and dropout in MOOCs with behavioral and social features. *International Educational Data Mining Society*. https://files.eric.ed.gov/fulltext/ED593209.pdf

[21] Grenier, S., Gagné, M., & O'Neill, T. (2024). Self-determination theory and its implications for team motivation. *Applied Psychology*. https://doi.org/10.1111/apps.12526

[22] Hakimi, M., Shahidzay, A. K., & Aslamzai, S. (2024). Exploring factors influencing MOOC adoption in Afghanistan's educational landscape. *International Journal of Scientific Multidisciplinary Research*, *2*(1), 97-112. https://doi.org/10.55927/ijsmr.v2i1.8020

[23] Harju, M., Leppänen, T., & Virtanen, I. (2018). Interaction and student dropout in Massive Open Online Courses. *arXiv preprint arXiv:1810.08043*. https://doi.org/10.48550/arXiv.1810.08043

[24] Haugsbakken, H. (2024). A MOOC about MOOC making: Findings and results. In *EDULEARN24 Proceedings* (pp. 10017-10027). IATED. https://doi.org/10.21125/edulearn.2024.2410

[25] Huacui, Z., Hossain, M. N., Zhen, K., & Kumar, N. (2024). Understanding the success factors of MOOCs' retention intention: A necessary condition analysis. *PloS one*, *19*(11), e0310006. https://doi.org/10.1371/journal.pone.0310006

[26] Huang, L., Liang, M., Xiong, Y., Wu, X., & Lim, C. P. (2024). A systematic review of technology-enabled teacher professional development during COVID-19 pandemic. *Computers & Education*, 105168. https://doi.org/10.1016/j.compedu.2024.105168

[27] Ip, K. (2024). The rise of EdTech: Transforming education through entrepreneurial ventures. *Advances in Online Education: A Peer-Reviewed Journal*, *3*(2), 177-193. https://doi.org/10.69554/NSVD4541

[28] Jiang, J. A., Robledo Yamamoto, F., Nagy, V., Zander, M., & Barker, L. (2023). Data privacy in learning management systems: Perceptions of students, faculty, and administrative staff. In *International Conference on Human-Computer Interaction* (pp. 100-115). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-48060-7_8

[29] Joshi, B. M., & Khatiwada, S. P. (2024). Analyzing barriers to ICT integration in education: A systematic review. *The Third Pole: Journal of Geography Education*, *24*, 25-45. https://doi.org/10.3126/ttp.v24i1.73325

[30] Karimi, H., & Khawaja, S. (2024). Perspective chapter: Navigating the changing landscape: Innovations and transformations in tertiary education. https://doi.org/10.5772/intechopen.1005389

[31] Kizilcec, R. F., & Schneider, E. (2015). Motivation as a lens to understand online learners: Toward data-driven design with the OLEI scale. *ACM Transactions on Computer-Human Interaction (TOCHI)*, *22*(2), 1-24. https://doi.org/10.1145/2699735

[32] Kumar, R. M., Velmurugan, J. S., & Suryakumar, M. (2024). Enhancing quality of knowledge through online courses and improving skill among college students. *Library of Progress-Library Science, Information Technology & Computer*, *44*(3). https://tinyurl.com/57xdyz2c

[33] Lee, C., & de Vries, W. T. (2019). Sustaining a culture of excellence: Massive Open Online Course (MOOC) on land management. *Sustainability*, *11*(12), 3280. https://doi.org/10.3390/su11123280

[34] Liu, M., Zha, S., & He, W. (2019). Digital transformation challenges: A case study regarding the MOOC development and operations at higher education institutions in China. *TechTrends*, *63*, 621-630. https://doi.org/10.1007/s11528-019-00409-y

[35] Maphosa, V., & Maphosa, M. (2023). Opportunities and challenges of adopting MOOCs in Africa: A systematic literature review. *Massive Open Online Courses-Current Practice and Future Trends*. https://doi.org/10.5772/intechopen.1001298

[36] Martin, F., & Bolliger, D. U. (2018). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. *Online learning*, *22*(1), 205-222. https://doi.org/10.24059/olj.v22i1.1092

[37] Maspul, K. A. (2024). Revolutionizing online higher education: A theoretical approach. *Insights: Journal of Primary Education Research*, *1*(2), 44-52. https://doi.org/10.59923/insights.v1i2.162

[38] Meinel, C., Friedrichsen, M., Staubitz, T., Reinhard, S., & Köhler, D. (2024). Assessment methods for online teaching. https://tinyurl.com/2p8mz2ef

[39] Murray-Johnson, K., & Dewsbury, B. (2024). Strengthening inclusive teaching with a MOOC: Adult education and STEM as professional development partners. *New Directions for Adult and Continuing Education*, *2024*(181), 29-40. https://doi.org/10.1002/ace.20519

[40] Omar, A. M., Suleiman, S. M., & Ali, Z. H. (2024). Exploring perspectives and challenges of information professionals in accessing massive open online courses for professional development. *Library and Information Science Research E-Journal*. https://dx.doi.org/10.32655/LIBRES.2024.1.2

[41] Ong, E., & Conn, K. (2024). Future directions and conclusions. In *The Emergence of the Digital World: Friend or Foe to Young Adults in the Post-pandemic Era?* (pp. 197-220). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-97-3098-8_7

[42] Pellas, N. (2024). Comparing quality and autonomous learning of teacher professional development programs in MOOCs and LMS. *Education and Information Technologies*, 1-35. https://doi.org/10.1007/s10639-024-13154-4

[43] Rahmani, A. M., Groot, W., & Rahmani, H. (2024). Dropout in online higher education: A systematic literature review. *International Journal of Educational Technology in Higher Education*, *21*(1), 19. https://doi.org/10.1186/s41239-024-00450-9

[44] Rogers, E. M., Singhal, A., & Quinlan, M. M. (2014). Diffusion of innovations. In *An integrated approach to communication theory and research* (pp. 432-448). https://tinyurl.com/4yfkvk3zRoutledge.

[45] Sabour, S. (2024). Open source electronic courses (MOOCs) as a tool for digital distance learning: library science and documentation students of Khemis Miliana University as a model. *revue de bibliothéconomie*, *16*(1), 79-113. https://tinyurl.com/3nkvvpdt

[46] Salama, R., & Hinton, T. (2023). Online higher education: Current landscape and future trends. *Journal of Further and Higher Education*, *47*(7), 913-924. https://doi.org/10.1080/0309877X.2023.2200136

[47] Sareen, S., & Mandal, S. (2024). Challenges of blended learning in higher education across global north-south: A systematic and integrative literature review. *Social Sciences & Humanities Open*, *10*, 101011. https://doi.org/10.1016/j.ssaho.2024.101011

[48] Serafica, R. B., Francisco, K. A., & Oren, Q. C. A. (2023). Making broadband universal: A review of Philippine policies and strategies. https://hdl.handle.net/10419/284630

[49] Servado, R. (2024). The level of scientific research skills of senior high school students in an academic research. *Psychology and Education: A Multidisciplinary Journal*, *19*(10), 403-403. https://doi.org/10.5281/zenodo.11202917, ISSN 2822-4353

[50] Srinara, N. (2024). *Exploring the challenges and enablers of adopting online learning innovations in Singapore's private education institutions: A managerial perspective* (Doctoral dissertation). https://doi.org/10.17869/enu.2024.4045588

[51] Tang, S., Lei, C. U., & Wei, H. Q. (2024). The impact of learning experiences in MOOCs on students' future study plans. In *2024 IEEE International Conference on Teaching, Assessment and Learning for Engineering (TALE)* (pp. 1-8). IEEE. https://doi.org/10.1109/TALE62452.2024.10834320

[52] Van Luong, N., Tinh, T. T., Yen, N. T. H., & Thuy, D. T. (2024). Integrating open knowledge and administrative management in the digital transformation model of education institutions: An effective approach. *International Journal of Religion*, *5*(7), 290-302. https://doi.org/10.61707/2vywvv49

[53] Yadav, S. (2025). Enhancing digital competencies of teachers: A roadmap for modern educators in the digital era. In *Fostering Teacher Skills and Critical Thinking in Modern Education* (pp. 109-134). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3373-1692-5.ch005

[54] Yan, M., & Pourdavood, R. G. (2024). Faculty and student perspectives on online learning in higher education. *Education Sciences*, *14*(8), 801. https://doi.org/10.3390/educsci14080801

[55] Yuan, L., Powell, S. J., & Olivier, B. (2014). Beyond MOOCs: Sustainable online learning in institutions. https://e-space.mmu.ac.uk/id/eprint/619736

[56] Zakaria, I., Anual, N., Abdul Karim, Z. H., Kozako, M. F., Nurul'ain, I., & Zamri, M. N. (2024). The evolution, challenges and prospects of implementing Massive Open Online Courses (MOOCs) in Malaysian public universities. *International Journal of e-Learning and Higher Education (IJELHE)*, *19*(1), 59-82. https://ir.uitm.edu.my/id/eprint/91994

[57] Zobel, T. E. I., & Meinel, C. (2022). Towards personalized, dialogue-based system supported learning for MOOCs. In *Innovations in Learning and Technology for the Workplace and Higher Education: Proceedings of 'The Learning Ideas Conference'2021* (pp. 425-435). Springer International Publishing. https://doi.org/10.1007/978-3-030-90677-1_40