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University lecturers' insights in asynchronous training: A moodle-based national professional development program

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Abstract. This study explores university lecturers' perceptions of a national professional development program delivered asynchronously via the Moodle platform in Indonesia. While asynchronous learning is increasingly adopted for large-scale training, limited research has examined how lecturers in developing countries perceive its usability, effectiveness, and challenges. Addressing this gap, the study aimed to investigate lecturers' perceptions and the challenges they encountered during Moodle-based asynchronous training. Using a mixed-methods approach with a sequential explanatory design, this study involved 511 Indonesian lecturers selected through total population sampling for the quantitative phase and purposive sampling for the qualitative interviews. The questionnaire as the quantitative instrument measured four sub-scales: accessibility, ease of use, effectiveness, and motivational impact of LMS. The questionnaire demonstrated strong reliability (Cronbach's Alpha = 0.877). Descriptive statistical analysis was employed, revealing high mean scores for all aspects (M = 4.65 to 4.85), indicating positive perceptions of the training. The highest agreement was found in the ease of implementing the training via the LMS (M = 4.85, SD = 0.39). Qualitative data were collected through semi-structured interviews and analysed thematically, highlighting challenges such as unstable internet access, limited device functionality, and unclear material organization. These results suggest that while Moodle is perceived as an effective tool for professional development, structural and technical improvements are needed. The study recommends enhanced technical support, better content structuring, and training orientation to increase engagement and learning outcomes in similar future programs.

Introduction

Professional development (PD) in higher education has undergone significant evolution in recent decades, especially with the expansion of online learning technologies. Traditionally, PD was delivered through face to face workshops and seminars; however, the advancement of digital tools and internet connectivity has led to a rise in asynchronous PD formats, particularly in response to the growing demand for flexible, scalable, and accessible training opportunities for university educators. Asynchronous platforms, such as Learning Management Systems (LMS), allow

participants to engage with training materials at their own pace, which is especially beneficial for adult learners with diverse schedules and responsibilities (Boelens et al., 2017; Trust & Whalen, 2020). Asynchronous learning allows participants to access content at their convenience, promoting greater flexibility and autonomy (Apoko, 2022; Hrastinski, 2008). This model is increasingly recognized for its capacity to support educators' continuous growth to overcome their scheduling and geographic barriers (Sinclair et al., 2017).

Asynchronous PD has been implemented in various educational settings and disciplines, demonstrating effectiveness in diverse international contexts. In a study conducted in the United States, Trust and Whalen (2020) examined how asynchronous learning communities fostered knowledge sharing and collaboration among K–12 educators. Similarly, a study in Sri Lanka showed that appropriate designed online learning through asynchronous activities could promote students' motivation and improve collaboration and a sense of community among peers (Apoko et al., 2024; Peramunugamage et al., 2024). Research in Oman by Al-Balushi & Al-Abdali (2015) highlighted how asynchronous modes significantly improved professional teaching practices among science teachers for creativity.

Despite the growing support for asynchronous PD, its effectiveness is influenced by several factors. Research by Swan (2001) & Hendra et al., (2025) found that design clarity, interaction with instructors, and active discussion forums among course participants significantly affected learners' satisfaction and perceived learning of asynchronous activities. Likewise, a qualitative research approach with a literature review by Suardi (2024) reported that while online platform offers opportunities for personalized learning experiences for teachers, it demonstrates some significant challenges such as technological gaps, dearth of digital literacy, and resistance to changes. Thus, effectiveness is context-dependent, and insightful design and support systems are essential to maximizing outcomes. Analyses of online PD programs have generally shown positive outcomes. For instance, Darling-Hammond et al. (2017) reported that well-designed asynchronous PD programs could improve instructional practices and student achievement when aligned with clear goals and supported by ongoing feedback. In addition, incorporating educational technology into teaching and learning process could increase student engagement, improve knowledge retention, and foster higher order thinking skills (HOTS). However, the impacts might vary dependent on the type of technology employed, pedagogical approach, and implementation contexts (Olateju et al., 2024).

One of the open-source learning management systems (LMS) platforms, widely used in online PD programs, is Modular Object-Oriented Dynamic Learning Environment (Moodle). It has been adopted globally in higher education to deliver asynchronous professional development programs and gained popularity due to its user-friendly features, interactive tools, and adaptability for large-scale training programs (Xiao, 2020). Its ease and the flexibility make it suitable for various instructional designs, especially for the instructors in organizing academic activities such as lesson plans, course materials, assessments, social interaction, group discussion, etc (Bojiah, 2022). Ghana, Sarfo & Yidana (2016) found that Moodle-based PD significantly assisted university lecturers' to acquire knowledge and develop skills in designing course and utilising Moodle in teaching and learning activities. Their interest and enthusiasm were also increased in the training program. Using a survey and reflective journals, their study showed that asynchronous access to video lectures, quizzes, journals, and discussion forums facilitated effective knowledge acquisition.

In the context of Asian higher education, Moodle has also been integrated into faculty development. A study in Japan by Asada et al. (2021) used an E-syllabus development design to investigate how lecturers perceived Moodle-based training for model core curriculum (MCC) development. Their findings revealed that Moodle's ease of use, data integration and analytical

aspects were better than the Excel-based syllabus. Likewise, a study from Malaysia by Yunos et al. (2024) through Focus Group Discussions (FGDs) among lecturers reported that the implementation of Moodle design included three best practices such as optimizing the task of e-learning management, utilising the options of restrictions to uphold the student integrity, and implementing regular data backups.

Research in Eastern Europe and Australia has also demonstrated the transformative potential of Moodle for asynchronous teacher training. In Russia, Aikina & Bolsunovskaya (2020) found through a qualitative study that 20 teachers who participated in Moodle-based instruction enhanced their learning and teaching autonomy and ICT integration skills significantly. However, infrastructural limitations, such as system failures and Internet access to laptops, remained a challenge. Similarly, a study in an Australian university by Zanjani (2016) employing interviews highlighted the importance of user-friendly structure, support for privacy and anonymous posting, and more customisable student-centred tools in maintaining lecturer engagement.

In the Middle East, Moodle's role in asynchronous PD has been examined in several higher education institutions. A study from Yemeni by Hassan (2024) used a mixed-methods approach to investigate the effectiveness of Moodle-based training for EFL faculty members. Results indicated moderate improvements in using Moodle as a digital teaching tool. The learning activities with Moodle had a positive impact on their language skills and learning motivation as well as promoted collaborative learning autonomy. Similarly, in Jordan, Albashtawi & Al Bataineh (2020) found through a quasi experimental design that 26 EFL learners appreciated Moodle's accessibility, easy use, and usefulness in improving their language skill performance.

Studies consistently show that while Moodle-based asynchronous PD in higher education offers notable advantages such as flexibility, scalability, and cost effectiveness it also comes with challenges related to content management, user engagement, and technological readiness. To address these, researchers have recommended the inclusion of orientation modules, improved instructional design, and ongoing technical support (Philipsen et al., 2019). As digital transformation continues to shape faculty development, especially in developing contexts like Indonesia, understanding lecturers' perceptions and experiences is essential for designing responsive, inclusive, and effective professional learning programs.

Prior studies have explored various aspects of asynchronous professional development, including learner engagement Olugbade et al. (2023), innovative learning model Morze et al. (2024) and learning outcomes in Moodle-based blended learning design (R. N. Sari & Amalia, 2021). However, limited research has specifically examined university lecturers' perceptions of Moodle-based asynchronous training within the context of national professional development programs in Indonesia. Most existing studies tend to focus either on student users or on synchronous and blended modes, leaving a gap in understanding how higher education faculty in developing contexts experience asynchronous, large-scale training.

Addressing this gap, the present study aims to investigate university lecturers' perceptions of a Moodle-based asynchronous training program implemented as part of a national professional development initiative in Indonesia. Specifically, the study explores how lecturers engage with the LMS and what challenges they encounter during the training. Understanding these perceptions is crucial for improving future training designs, ensuring accessibility, flexibility, and enhancing overall participation and learning outcomes (Bock & Van Wyk, 2025; Moorhouse & Kohnke, 2021). As digital transformation continues to influence educational policy and professional learning strategies, empirical insights into participants' experiences are essential for shaping effective, inclusive, and sustainable training models. Therefore, the research is guided by the following

questions: 1) How do Indonesian university lecturers perceive the Moodle-based national asynchronous training? , 2) What are the encountered challenges in the asynchronous training?

Method

Research Design

This study employed a mixed-methods approach using a sequential explanatory design**,** which involves the collection and analysis of quantitative data followed by qualitative data to further explain or elaborate on the initial findings (Creswell & Plano Clark, 2018). In the first phase, a structured questionnaire was administered to the participants to gather measurable insights on their perceptions of the Moodle-based asynchronous training. The second phase involved semi-structured interviews with selected participants to explore deeper insights and contextualise the quantitative results, particularly regarding challenges with the LMS. This design enabled a comprehensive understanding of participants' engagement by integrating statistical trends with personal narratives, thereby enhancing the study's validity and depth (Ivankova et al., 2006; Widana et al., 2023).

Context and Participants

This study was conducted in a private reputable university in Eastern Jakarta in which this university had been assigned by the government of Indonesia to nationally hold a lecturer training for improving basic skills of instructional techniques (IBSIT or known as PEKERTI). One of the activities in this training was using a Moodle-based LMS to accommodate the learning materials, assignments, and the assessments (pre-test and post-test). There were 17 materials provided available in the LMS for the participants to understand and practice doing the activities. The materials included foundations of education, policy of education in higher education, developing curriculum and lesson plans, instructional design, learning taxonomy, effective communication, building motivations, learning media to create, developing instructional materials, and learning assessment as well as teaching practice. The training lasted within 14 days to complete the assignments and do the tests.

This study involved 511 university lecturers in the batch 7-10 who participated in a 76-hour training program designed to enhance their professional competencies. The sampling techniques used in this study was a total population sampling. The participant pool was nearly gender-balanced, with 50.10% male and 49.90% female. In terms of age, the majority were between 31–35 years old (28.77%), followed by those over 40 (34.05%) and 25–30 years old (18.98%). Most participants were from universities located on Java Island (77.10%), with the remaining 22.90% from outside Java. Regarding academic qualifications, the vast majority held a Master's degree (83.95%), while 16.05% had completed a Doctoral program. In terms of teaching experience, over half (54.60%) had been teaching for 1–5 years, while 26.61% had 6–10 years of experience. A smaller proportion had less than 1 year (4.89%), 11–15 years (9.20%), or more than 15 years (4.70%) of teaching experience. These demographics displayed in Table 1 reflect a relatively young and early- to mid-career cohort of lecturers actively engaged in professional development across diverse Indonesian higher education institutions.

Table 1. The Demographics Of The Participants

Categories	Sub-categories	N=511	%
Gender	Male	256	50.10
	Female	255	49.90
Age	< 25 years old	3	0.59
	25-30 years old	97	18.98

Categories	Sub-categories	N=511	%
	31-35 years old	147	28.77
	36-40 years old	90	17.61
	> 40 years old	174	34.05
University regions	Java island	394	77.10
	Non-Java Island	117	22.90
Education qualifications	Master program	429	83.95
	Doctoral program	82	16.05
Length of teaching experience	< 1 year	25	4.89
	1-5 years	279	54.60
	6-10 years	136	26.61
	11-15 years	47	9.20
	> 15 years	24	4.70

Data Collection

Data collection in this study involved two primary instruments, namely an online questionnaire and semi-structured interviews, aligned with the sequential explanatory mixed-methods design. The questionnaire, distributed to the university lecturers who were willing to respond it. This aimed to quantify their perceptions of the Moodle-based asynchronous training. It consisted of closed-ended Likert-scale items designed to measure: (1) accessibility, (2) usability, (3) effectiveness, and (4) motivational aspects of the LMS. To ensure reliability, the questionnaire was pilot-tested with a separate group of the lecturers, and the internal consistency was confirmed with a Cronbach's Alpha coefficient of 0.877, indicating a strong level of reliability. Following the quantitative phase, semi-structured interviews were conducted to explore their experiences in more depth, particularly regarding challenges and suggestions for improvement. In the qualitative phase, purposive sampling was employed to select four participants representing various regions, academic disciplines, and levels of teaching experiences as well as the education qualifications. These individuals were chosen based on their willingness to elaborate on their training experiences and challenges in utilising the LMS. The qualitative data were collected through one-on-one interviews conducted via Zoom within 10-15 minutes, with open-ended questions. This two-phase approach allowed for robust triangulation, ensuring that the quantitative trends were well-supported by qualitative insights.

Data Analysis

After data collection, the study employed distinct analysis techniques for the quantitative and qualitative phases, consistent with the sequential explanatory mixed-methods design. The quantitative data from the online questionnaire were analyzed using descriptive statistics including means, standard deviations, and percentage distributions to identify patterns in lecturers' perceptions of the Moodle-based LMS. For the qualitative data, responses from the semi-structured interviews were analysed using a thematic analysis approach, involving coding, categorising, and interpreting emerging themes to provide deeper insights into the quantitative findings (Braun & Clarke, 2006). This integration of numerical trends with narrative data strengthened the interpretation and offered a comprehensive understanding of the participants' experiences, enhancing the credibility and depth of the study (Creswell & Plano Clark, 2018).

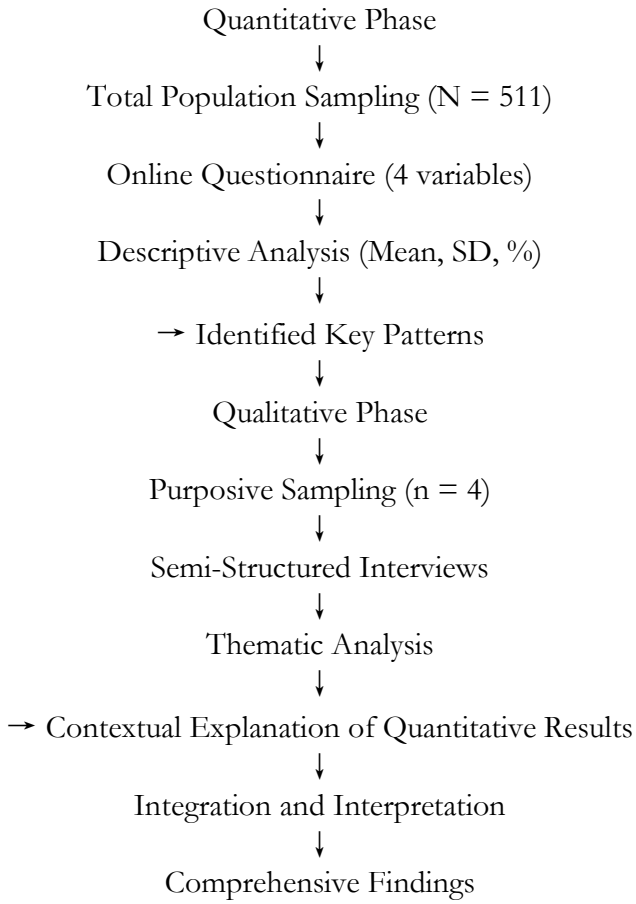

Image 1. A scheme of data analysis procedure

Results and Discussion

Results

Based on the data in Table 2, university lecturers expressed overwhelmingly positive perceptions of the Moodle-based Learning Management System (LMS) used in the national training program. The highest level of agreement was observed in the statement, "LMS makes it easier to implement online training," with 85.52% of respondents strongly agreeing and another 13.70% agreeing, resulting in a high mean score of 4.85 (SD = 0.39). Similarly, a significant majority (82.19%) strongly agreed that the LMS was easily accessible, while 15.66% agreed, yielding a mean of 4.79 (SD=0.48). These results suggest that the Moodle platform was perceived as both user-friendly and practical in supporting the delivery of asynchronous professional development training.

Furthermore, the use of LMS was considered highly effective by the lecturers, with 82.00% strongly agreeing and 16.83% agreeing that it contributed effectively to the training, reflected in a strong mean score of 4.81 (SD=0.43). In terms of affective engagement, 71.04% of participants strongly agreed and 23.87% agreed that the LMS increased their enthusiasm for participating in the training, although this item had slightly lower agreement compared to others, with a mean of 4.65 (SD=0.59). Overall, the findings indicate that lecturers not only found the LMS technically supportive and efficient but also engaging and motivating, reinforcing the potential of Moodle-based asynchronous learning as a viable model for large-scale professional development initiatives in higher education.

Table 2. Lecturers' insights on the Moodle-based LMS of the training

No	Statements	SD	D	N	A	SA	Mean	STDEV
1.	LMS is easily accessible.	0.20%	0.20%	1.76%	15.66%	82.19%	4.79	0.48
2.	LMS makes it easier to implement online training.	0.00%	0.20%	0.59%	13.70%	85.52%	4.85	0.39
3.	The use of LMS is very effective in the training.	0.00%	0.20%	0.98%	16.83%	82.00%	4.81	0.43
4.	LMS increases enthusiasm in participating in training.	0.00%	0.59%	4.50%	23.87%	71.04%	4.65	0.59

Notes: SD= Strongly Disagree, D= Disagree, N= Neutral, A= Agree, and SA = Strongly Agree

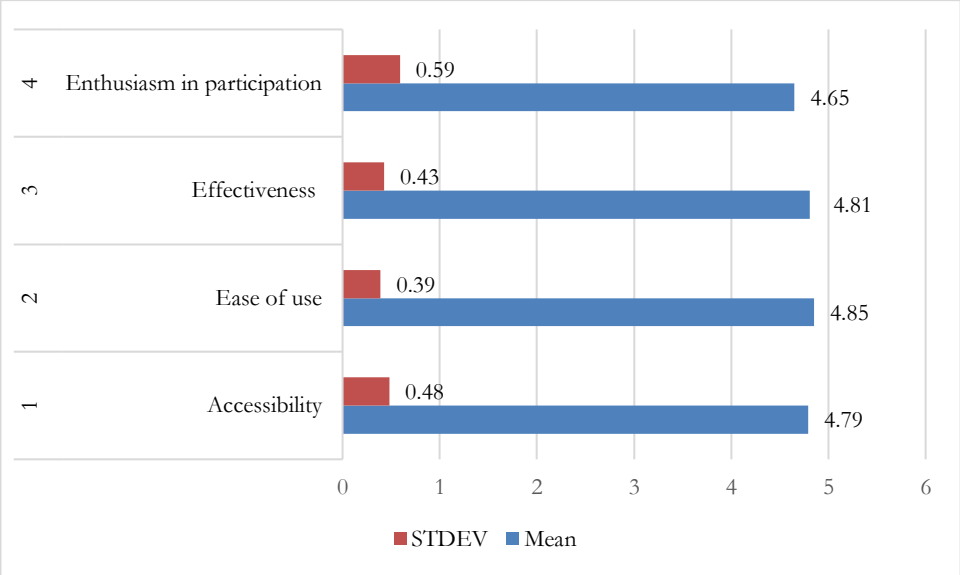

Image 2. Mean and SD values for each Moodle-based LMS features and outcomes

The qualitative findings from the interviews complement and enrich the quantitative results presented in Table 2, highlighting the generally positive perceptions of the Moodle-based LMS while also uncovers practical challenges experienced by participants. Most interviewees reported minimal difficulties in using the LMS itself, aligning with the high levels of agreement in the survey items regarding accessibility (Mean=4.79) and ease of use for online training implementation (Mean=4.85). For instance, Respondent 1 affirmed that the LMS posed no major obstacles but recommended better organisation of the task menu to follow the training schedule, indicating a desire for improved navigational clarity rather than fundamental usability concerns. This suggests that while the LMS was technically accessible, there are areas for improvement in content structure and user experience design.

However, the qualitative responses also revealed recurring technical challenges not captured in the survey's closed-ended items. Several participants, including Respondents 2, 3, and 4, cited unstable Internet connectivity and hardware-related issues such as overloaded laptops due to prolonged Zoom usage as barriers to optimal engagement with the LMS. While Respondent 1 found no difficulties with the Internet access, she had a confusion in uploading the assignments in the LMS. These insights provide a nuanced understanding of the quantitative finding that 71.04% of respondents strongly agreed that the LMS increased their enthusiasm (Mean=4.65), by revealing the contextual constraints that may have moderated participants' enthusiasm and performance. Therefore, while the LMS is viewed positively overall, the interview data underscore the importance

of addressing infrastructure limitations and improving platform organisation to fully support lecturers' engagement in asynchronous professional development. The following is the excerpts from the respondents.

"In general, there are no obstacles in using the LMS. However, I suggest to sort the task menu on the LMS according to the training material schedule. Since the materials on the LMS are randomly organised, I am a little confused when working on and uploading the assignments." (Respondent 1, A female lecturer from Chemistry Education Program).

"*There are several obstacles faced, such as network obstacles when working on assignments and LMS access which sometimes exits by itself.*" (Respondent 2, A male lecturer from Psychology Program)

"*The obstacles are related to the network which is sometimes lost and the laptop is fully used for Zoom from morning to evening so that my laptop experiences errors when using the LMS.*" (Respondent 3, A female lecturer from Sport Education Program)

"*The challenges could be the network and laptop device which sometimes experience interference and difficulty in finding materials and working on assignments in the LMS.*" (Respondent 4, Male lecturer from History Education Program)

The integration of both quantitative and qualitative results above indicates that while the Moodle-based LMS is effective and well-received in asynchronous training, its implementation is influenced by situational factors such as infrastructure readiness and material organisation. This highlights the importance of designing asynchronous training that is not only technologically sound but also logistically supportive. The comment from a male History Education lecturer, "*There was difficulty in finding materials and working on assignments in the LMS*" supports the need for clearer structuring of LMS content, even as the quantitative results show strong general satisfaction. In brief, the quantitative findings show a strong endorsement of Moodle as an asynchronous training tool, and the qualitative data deepen this understanding by revealing the operational and contextual factors that can affect the user experience. This integrated view offers a more nuanced picture of how university lecturers experience professional development in online environments.

Discussion

The results of this study highlight a generally positive perception of the Moodle-based Learning Management System (LMS) used in the national professional development training for university lecturers. The high mean scores across all four statements in Table 1 indicate that participants found the LMS to be accessible (M=4.79), easy to use for online training (M=4.85), effective in delivering content (M=4.81), and motivating (M=4.65). These findings align with previous studies that emphasise the effectiveness of Moodle as an asynchronous platform for facilitating professional learning in higher education contexts (Al-Ajlan & Zedan, 2008; Cavus & Zabadi, 2014). Asynchronous LMS platforms such as Moodle enable flexible learning that accommodates diverse teaching schedules and learning paces, which is particularly important for adult learners like university lecturers (Hrastinski, 2008; Munna et al., 2024; Sinclair et al., 2017).

In addition to perceived accessibility and effectiveness, the LMS was reported to enhance participants' engagement and enthusiasm, as 94.91% of respondents either agreed or strongly agreed with this sentiment. This aligns with research suggesting that well-structured LMS environments can promote students' self-regulated learning, their engagement, motivation, and enthusiasm (Bradley, 2020; Devi & Aparna, 2020; Paechter & Maier, 2010; Simelane-Mnisi, 2023; Vargas-Murillo et al., 2023). The asynchronous nature of the training provided participants with control over their learning process, which is consistent with the principles of adult learning theory,

especially in the context of self-directed professional development (Merriam & Bierema, 2013). These outcomes are particularly important in large-scale national training programs where logistical challenges may hinder synchronous participation.

However, the qualitative data introduce a more nuanced perspective, revealing several challenges experienced by participants. While one lecturer indicated no major difficulties, she recommended better sequencing of tasks based on the training schedule, suggesting that even in well-received platforms, instructional design plays a crucial role in user satisfaction (Mohd Nasir et al., 2021; Shchedrina et al., 2021). Similarly, other participants reported network instability, involuntary logouts, and hardware overload particularly due to the simultaneous use of LMS which impacted their ability to access materials and submit assignments effectively. These concerns echo findings from previous studies that highlight technological limitations, such as insufficient bandwidth, difficulty adapting, system failures, and difficulty understanding the information as significant barriers to online learning in developing contexts (Adarkwah, 2021; Aikina & Bolsunovskaya, 2020; Apoko & Yatri, 2024; N. K. Sari et al., 2023).

The intersection of these qualitative insights with the survey findings suggests that while Moodle is a suitable platform for asynchronous training, its success is contingent upon not only the platform's inherent features but also the supporting technological infrastructure. As emphasised by Boelens et al. (2017), effective blended and online learning depends on flexible instructional planning, stimulating interaction, learner support mechanisms, and reliable access to digital tools. In this study, the LMS was praised for usability and effectiveness, but logistical barriers such as poor connectivity and hardware strain moderated participants' experiences. This finding reinforces the need for institutional support systems, including technical guidance and device access, to ensure equitable participation and sustained engagement in online professional development (Makruf et al., 2022; Olugbade, 2023; Satriani et al., 2025; Trust & Whalen, 2020).

Overall, the combination of quantitative and qualitative findings affirms the potential of Moodle-based asynchronous training for professional development among university lecturers. While participants widely endorsed the accessibility and usefulness of the LMS, the interviews surfaced contextual challenges that must be addressed for optimal implementation. Future training programs should integrate clearer content sequencing, offer offline or low-bandwidth alternatives, and ensure participants have access to sufficient technological resources. As digital transformation continues to redefine professional learning, responsive design and equitable access will remain key determinants of success in higher education training initiatives (Moorhouse & Kohnke, 2021; Purnadewi & Widana, 2023).

Conclusion

This study concludes that the Moodle-based asynchronous Learning Management System (LMS) was highly effective and positively perceived by university lecturers participating in a national professional development program. Quantitative findings revealed strong agreement regarding the LMS's accessibility, ease of use, effectiveness, and its ability to foster enthusiasm for participation. These perceptions were supported by qualitative insights, which affirmed the general usability of the platform while also highlighting challenges such as disorganised task menus, unstable internet connectivity, and hardware limitations. Overall, the study reinforces the potential of Moodle as a viable tool for delivering scalable, flexible professional learning in higher education, particularly when designed with user-centred instructional strategies. Despite these promising findings, the study is not without limitations. First, it relied on self-reported data, which may be subject to personal bias or social desirability effects. Additionally, the study did not include objective measures of learning outcomes or longitudinal tracking of behavioral changes following the training. The

sample, while sizable, was limited to lecturers who had access to the required technology and may not represent those with limited digital infrastructure. Based on these findings, it is recommended that future lecturer training programs using LMS platforms like Moodle ensure better content organisation, provide technical support, and consider offline or low-bandwidth alternatives. Further research should also explore the long-term impact of such training on teaching practices and student outcomes.

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