



Outcome-Based Education, E-Learning, and Student Satisfaction: Evidence from Indonesia and Thailand

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Abstract

*The implementation of the Outcome-Based Education (OBE) curriculum in Southeast Asia, particularly in Indonesia and Thailand, is relatively new; therefore, it is interesting to research students' responses to its implementation. This research aims to determine students' responses to the implementation of the OBE supported by E-Learning as a form of evaluation of the ongoing learning process. The subjects of this research were 250 students at the Faculty of Tarbiyah and Teacher Training at Alma Ata University (UAA), Indonesia, and 250 students at the Islamic College at Prince of Songkla University (PSU), Thailand. This research hypothesizes that the implementation of the OBE curriculum supported by E-Learning at both universities has a significant influence on student satisfaction with learning. This research uses quantitative methods with a quasi-experimental research design. Based on the research results obtained, there was an increase in average student satisfaction before and after the implementation of the OBE Curriculum, supported by E-Learning, at the two universities. This can be seen from the results of the Independent Samples *t* Test with sig. *P*-value <0.05. The OBE Curriculum, supported by E-Learning with a blended learning model, is very suitable for implementation at universities as a form of learning revolution in the digital era.*

Keywords: *Outcome-Based Education; E-Learning; Curriculum Development.*

A. Introduction

The curriculum serves as a fundamental framework and quality assurance mechanism, guiding the implementation of learning processes in higher education. It is conceptualized as a consciously designed and integrative educational experience that enables students to achieve learning outcomes and to prepare for participation in an increasingly dynamic society (Mulenga, 2019). A well-structured curriculum articulates learning objectives, targeted competencies, instructional content, learning strategies, and evaluation mechanisms in a coherent manner. These competencies encompass not only knowledge, but also attitudes and skills, including critical thinking, self-confidence, collaborative learning capacity, and information and communication technology (ICT) literacy (Alismail & McGuire, 2015). Consequently, curriculum design carries multidimensional implications for student development across cognitive, affective, and psychomotor domains.

Curriculum development theory emphasizes that curriculum design is a complex decision-making process involving institutional goals, course objectives, and instructional materials, all of which must be aligned with broader educational purposes (Wahid & Hamami, 2021). In this context, many higher education systems have faced persistent challenges arising from traditional curriculum orientations, including weak alignment between graduate competencies and labor market demands, lecturer-centered learning practices, limited adaptability of graduates, and assessment systems that inadequately capture learning outcomes. In Indonesia, these challenges became increasingly visible prior to the formal adoption of Outcome-Based Education (OBE) in higher education, particularly as universities struggled to demonstrate measurable graduate competencies and accountability.

In response, higher education institutions have increasingly transitioned toward Outcome-Based Education (OBE), a curriculum framework that organizes learning, assessment, and evaluation around explicitly defined and measurable learning outcomes. Within OBE, the focus shifts from what lecturers teach to what students are expected to achieve. This paradigm encourages student-centered learning, enhances graduate competitiveness, and strengthens alignment between educational processes and workforce needs. As a result, OBE has been widely adopted across diverse national contexts, including the United States, Canada, New Zealand, Australia, Hong Kong, South Africa, Thailand, Malaysia, and Indonesia. Empirical studies consistently demonstrate that OBE contributes to student success through the alignment of learning

outcomes, instructional strategies, assessment practices, and learning environments (Japee & Oza, 2021; Syeed et al., 2022; Liu, 2023; Rozadi, 2021; Pritasari et al., 2023; Susarno et al., 2024). Through systematic curriculum design—from program learning outcomes to course-level assessments—OBE aims to ensure that graduates acquire competencies relevant to contemporary societal and labor market demands (Dwi Pusparini, 2020).

One practical pathway for operationalizing OBE in higher education is through blended learning supported by digital technologies. In this regard, curriculum quality is inseparable from institutional governance and management, as OBE requires universities to continuously evaluate learning effectiveness based on learning outcomes while addressing managerial and technological challenges (Hayani & Sutrisno, 2022; Song, 2023). These challenges are particularly salient for Generation Z students, whose learning experiences are deeply embedded in digital environments. E-learning expands access to learning beyond physical classrooms, facilitates interaction, and offers flexible learning structures that align with contemporary student lifestyles (Morrison et al., 2022; Hadisi La, 2015; Gupta & Gupta, 2020; Yazdi, 2021). Its relevance has further intensified following the COVID-19 pandemic, which accelerated the normalization of digitally mediated learning practices.

Despite the widespread adoption of e-learning platforms, many digital learning environments continue to replicate traditional instructional models. Students often engage passively with recorded lectures or static materials, followed by assessments that merely test their understanding of the content. The integration of OBE and e-learning seeks to challenge this model by aligning digital instruction with clearly articulated learning outcomes, thereby transforming online learning into a more active, purposeful, and outcome-oriented process. Previous studies indicate that OBE-integrated e-learning can enhance academic achievement (Akir et al., 2012), support outcome-aligned assessment systems (Yuniarti et al., 2024), and provide effective solutions to learning disruptions during crisis periods (Mallikarjuna et al., 2021).

Existing literature on OBE implementation in higher education has made substantial contributions, particularly in relation to policy frameworks, curriculum design, instructional strategies, and institutional support systems. In Indonesia, studies have predominantly examined implementation strategies and success factors (Muzakir, 2023; Kushari & Septiadi, 2022), comparative policy analyses (Mulyaman & Catherine, 2022), assessment instrument development (Jirasatitsin et al., 2023), character education



integration (Agus et al., 2024), and course-level applications such as English language instruction (Allo et al., 2024). In Thailand, research has primarily focused on syllabus assessment (Nguyen & Pham, 2019), the development of OBE-based engineering programs (Rattanamanee et al., 2020), and technology-driven instructional innovation (Jean-Francois, 2018). While these studies provide a strong foundation, they remain dominated by institutional and program-level perspectives, with limited attention to students' lived learning experiences as primary actors in OBE implementation.

As digital transformation in higher education accelerates, empirical studies that directly examine how students perceive and experience the integration of OBE and e-learning remain relatively scarce. Much of the existing research positions e-learning as a technical support system, without sufficiently linking it to students' perceptions of learning quality, satisfaction, or the achievement of learning outcomes (Jean-Francois, 2018; Jirasatitsin et al., 2023). Moreover, cross-national comparative studies within Southeast Asia—particularly those focusing on student experiences—are still limited. Although Indonesia and Thailand have both adopted OBE, differences in academic culture, digital readiness, institutional policy, and student characteristics suggest that OBE implementation may yield varied outcomes across contexts (Nguyen & Pham, 2019; Rattanamanee et al., 2020).

Addressing these gaps, the present study offers several contributions. First, it positions students' learning experiences as the central lens for evaluating OBE implementation integrated with e-learning, complementing existing policy- and design-oriented studies (Muzakir, 2023; Kushari & Septiadi, 2022). Second, it adopts a cross-national comparative approach by examining student responses in Indonesia and Thailand, a perspective that remains underrepresented in OBE research within Southeast Asia (Mulyaman & Catherine, 2022; Nguyen & Pham, 2019). Third, it empirically links OBE implementation with e-learning through an analysis of student satisfaction and learning experiences, thereby offering new insights into the effectiveness of OBE in digitally mediated higher education contexts (Jean-Francois, 2018; Allo et al., 2024).

Accordingly, this study aims to examine student responses before and after the implementation of OBE supported by e-learning at Universitas Alma Ata (UAA), Indonesia, and Prince of Songkla University (PSU), Thailand. By addressing these research gaps, the study contributes to a more nuanced understanding of how OBE and e-learning

interact across different cultural and digital infrastructure contexts in Southeast Asia, while also informing curriculum policy and higher education reform at both regional and global levels.

B. Method

This study employed a quasi-experimental design using a pretest–posttest model, involving two groups of students from two different institutions: the Faculty of Tarbiyah and Teacher Training at Universitas Alma Ata (UAA), Indonesia, and the College of Islamic Studies at Prince of Songkla University (PSU), Thailand. In addition to the research objectives, this design was selected because the researchers did not randomly assign participants; instead, they utilized naturally existing groups within each institution.

The study population comprised all students enrolled in the Faculty of Tarbiyah and Teacher Training at Universitas Alma Ata (UAA), Indonesia, and the College of Islamic Studies at Prince of Songkla University (PSU), Thailand. The research was conducted over two academic years, namely 2022/2023 and 2023/2024, involving a total of 500 respondents, comprising 250 students from UAA and 250 students from PSU. A saturated sampling technique was employed, whereby the entire population served as the research sample. This approach was adopted to obtain a comprehensive depiction of students' satisfaction perceptions regarding the implementation of the OBE curriculum at both institutions.

The research instrument was a learning satisfaction questionnaire consisting of 10 statements measured on a 4-point Likert scale (1 = very dissatisfied to 4 = very satisfied). The instrument covered three dimensions: (1) quality of instruction, (2) relevance and attainment of learning objectives, and (3) effectiveness of course organization. Content validity was assessed by two experts in curriculum studies and educational technology. Item validity was examined using item–total correlation, with all coefficients exceeding 0.30. Instrument reliability was evaluated using the test–retest method and further supported by Cronbach's alpha analysis, which indicated adequate internal consistency ($\alpha > 0.70$).

Data collection was conducted in two stages. The pretest was administered at the end of the even semester of the 2022/2023 academic year, prior to the implementation of the OBE curriculum. The posttest was conducted at the end of the odd semester of the 2023/2024 academic year, following the implementation of the OBE curriculum supported

by e-learning. The questionnaire was distributed online via Google Forms, with assurances of respondent anonymity and confidentiality. The response rate reached 100%.

Data analysis was performed using quantitative methods. Normality testing of the pretest–posttest score differences was conducted using the Shapiro–Wilk test. If the data were normally distributed, a paired-samples t-test was employed to examine differences in mean satisfaction scores before and after OBE implementation. When the normality assumption was not met, the Wilcoxon signed-rank test was applied. The results were reported along with effect sizes (Cohen’s *d*) and 95% confidence intervals. Comparative analyses were also conducted between institutions (UAA and PSU). Incomplete data were handled using listwise deletion. All statistical analyses were performed using SPSS version 27.

This study received ethical approval from the UAA Research Ethics Committee and institutional permission from PSU. All participants provided voluntary informed consent, and data confidentiality was maintained in accordance with established research ethics principles.

C. Results and Discussion

This section presents the empirical findings of the study regarding changes in student satisfaction before and after the implementation of the Outcome-Based Education (OBE) curriculum, supported by e-learning, at Universitas Alma Ata (UAA), Indonesia, and Prince of Songkla University (PSU), Thailand. The results are organized in three sections: first, to describe overall patterns of student satisfaction, followed by inferential analyses of pretest–posttest differences, and finally, a dimensional breakdown of satisfaction indicators. All findings are reported descriptively and statistically in accordance with the research design, without interpretative or theoretical elaboration, to provide a clear empirical basis for subsequent discussion.

1. Results

This study examined changes in student satisfaction before and after the implementation of the Outcome-Based Education (OBE) curriculum supported by e-learning at Universitas Alma Ata (UAA), Indonesia, and Prince of Songkla University (PSU), Thailand. The results are presented descriptively and inferentially to illustrate patterns of change at each institution as well as comparative tendencies across the two contexts.

Table 1. Descriptive statistics of student satisfaction before and after OBE implementation

Institution	Time	Mean	SD	N
UAA	Before	2.96	0.19	250
	After	3.33	0.10	250
PSU	Before	3.10	0.13	250
	After	3.32	0.13	250

Table 1 presents the descriptive statistics of overall student satisfaction before and after the implementation of OBE at both institutions. Prior to OBE implementation, PSU students reported a higher level of satisfaction ($M = 3.10$, $SD = 0.13$) compared to students at UAA ($M = 2.96$, $SD = 0.19$). This indicates that, at baseline, the learning environment at PSU was already perceived more positively by students. Following the implementation of OBE supported by e-learning, satisfaction levels increased at both institutions. At UAA, the mean satisfaction score rose to 3.33 ($SD = 0.10$), while at PSU it increased to 3.32 ($SD = 0.13$). These descriptive results suggest that OBE implementation was associated with an overall improvement in student satisfaction in both contexts, although the magnitude of change differed between institutions.

A closer examination of the mean differences reveals distinct patterns of change. UAA experienced a larger increase in satisfaction ($\Delta M = +0.37$) compared to PSU ($\Delta M = +0.21$). This indicates that the introduction of OBE and e-learning had a more pronounced effect at UAA, where initial satisfaction levels were relatively lower. In contrast, PSU demonstrated a more modest increase, which may reflect a ceiling effect given its already high baseline satisfaction.

To determine whether these observed changes were statistically significant, paired-samples t-tests were conducted for each institution, as presented in Table 2.

Table 2. Paired-sample t-test results of student satisfaction before and after OBE implementation

Institution	t(df=249)	Mean Difference	p-value	Cohen's d	95% CI
UAA	-14.5	-0.37	< .001	0.92	[-0.42, -0.32]
PSU	-9.87	-0.21	< .001	0.62	[-0.26, -0.17]

The results indicate that the increase in student satisfaction following OBE implementation was statistically significant at both UAA and PSU ($p < .001$). At UAA, the t-test yielded a large effect size (Cohen's $d = 0.92$), indicating a substantial change in student satisfaction following the intervention. At PSU, the effect size was moderate (Cohen's $d = 0.62$), suggesting a meaningful but less dramatic improvement. The 95% confidence intervals further confirm the robustness of these findings, as none of the

intervals included zero. These results demonstrate that the observed increases in satisfaction were not attributable to random variation but reflect systematic changes associated with the implementation of OBE supported by e-learning.

To further explore which aspects of student satisfaction contributed most to these changes, satisfaction scores were analyzed by instrument dimension, as shown in Table 3.

Table 3. Distribution of satisfaction scores by instrument dimension before and after OBE implementation

Institution	Time	Lecture Quality	Relevance of Learning Objectives	Effectiveness of Course Organization
UAA	Before	2.90	2.95	3.02
	After	3.30	3.35	3.34
PSU	Before	3.05	3.08	3.18

At UAA, all three dimensions—lecture quality, relevance, and attainment of learning objectives, as well as the effectiveness of course organization—showed clear improvements following the implementation of OBE. Lecture quality increased from a mean score of 2.90 to 3.30, indicating improvements in instructional delivery. The relevance and attainment of learning objectives showed the largest increase, rising from 2.95 to 3.35. This suggests that students perceived a stronger alignment between learning activities, assessments, and intended outcomes after OBE was implemented. The effectiveness of course organization also improved from 3.02 to 3.34, reflecting better structuring and management of learning activities within the e-learning environment.

At PSU, satisfaction scores were consistently high across all dimensions, even before the implementation of OBE. Lecture quality increased from 3.05 to 3.28, relevance of learning objectives from 3.08 to 3.30, and effectiveness of course organization from 3.18 to 3.38. Although the magnitude of change was smaller than at UAA, the results indicate incremental improvements across all dimensions. Notably, the effectiveness of course organization remained the highest-rated dimension at PSU both before and after the implementation of OBE, suggesting a stable and well-established learning structure.

When comparing the two institutions, the results reveal different trajectories of change. UAA demonstrated a substantial shift from moderate to high satisfaction across all dimensions, whereas PSU maintained a high level of satisfaction with gradual improvements. These patterns indicate that OBE and e-learning functioned as a transformative intervention at UAA and as a reinforcing mechanism at PSU.

In addition to the quantitative findings, supporting empirical observations from student feedback highlighted technical challenges related to unequal internet access

among some students. These challenges occasionally required students to seek alternative locations with more stable connectivity to participate in online learning activities. While these issues did not negate the overall positive trend in satisfaction, they indicate that the effectiveness of OBE-supported e-learning is influenced by the availability and reliability of technological infrastructure.

Overall, the results demonstrate that the implementation of OBE supported by e-learning was associated with statistically significant improvements in student satisfaction at both institutions. However, the magnitude and pattern of change varied depending on institutional context and baseline conditions, as reflected in both the descriptive and inferential findings.

2. Discussion

The positive outcomes of implementing Outcome-Based Education (OBE) supported by e-learning at the Faculty of Tarbiyah and Teacher Training (FITK) of Universitas Alma Ata (UAA) and Prince of Songkla University (PSU), as reflected in students' learning satisfaction, indicate tangible changes in the learning processes experienced by students. Student satisfaction is closely associated with a conducive learning environment, engaging course design, clear instructional structure, and ease of access to technology (Baber, 2020). Within the context of e-learning, students' experiences related to the accessibility of learning platforms, availability of learning features, flexibility of study time, and instructors' pedagogical approaches in guiding students to construct knowledge play a critical role in shaping students' perceptions (Nasiatin et al., 2023; Safari, 2024).

From the perspective of constructive alignment (Biggs), increased student satisfaction may be interpreted as an early signal that alignment among learning outcomes, learning activities, and assessment has begun to be perceived by students. Project-based assessments implemented within the OBE framework (Yen et al., 2023) may help students recognize clearer connections between what is learned and what is assessed. Nevertheless, perceived alignment does not necessarily equate to alignment that genuinely leads to improvements in conceptual understanding, higher-order thinking skills, or knowledge transfer. In other words, while satisfaction may serve as a prerequisite for high-quality learning, it is insufficient as a sole indicator of learning success.

Cross-institutional findings suggest that differences in the effects of OBE implementation supported by e-learning between UAA and PSU are not determined solely by digital infrastructure, but are also shaped by student readiness and prior

learning experiences. Contemporary research emphasizes that student readiness – such as digital literacy, attitudes toward technology, and self-efficacy – significantly influences student engagement in hybrid learning environments (Getenet et al., 2024). Students with low readiness in terms of technological access and hybrid learning experience tend to encounter difficulties in student-centered learning contexts. Conversely, students with higher readiness, including familiarity with educational technologies and hybrid learning models, experience more substantial gains in satisfaction. This finding aligns with Păcurar and Rus (2024), who argue that e-learning readiness and prior digital learning experience moderate the impact of technology-based learning on student perceptions and satisfaction. Furthermore, internal factors such as self-efficacy also influence students' ability to adapt to new pedagogical approaches (Getenet et al., 2024; Nuryanto, 2025). To deepen future research, it is necessary to examine the academic cultures of both institutions in order to generate richer insights into student perceptions of OBE and e-learning implementation.

Lecturers' roles in hybrid learning environments also exert a strong influence on student perceptions. Effective online communication models, clarity of instructional guidance, and well-structured assignments contribute to students' comfort and satisfaction with the learning process. However, student satisfaction with learning processes does not necessarily indicate positive outcomes in terms of content understanding. This observation is consistent with Fiock (2024), who notes that e-learning environments may appear more organized, accessible, and structured; however, they may not foster higher-order thinking skills unless intentionally designed to do so. Consequently, specialized instructional models are required when the objective is to measure improvements in specific cognitive competencies. Student satisfaction should therefore be understood as part of a broader learning ecosystem – one that indicates whether the learning environment supports comfort and motivation, rather than serving as a definitive measure of learning effectiveness (Amalia et al., 2025; Apriana, 2025).

Increases in student satisfaction should not be interpreted merely as a reflection of students' short-term expectations or perceived utility of learning activities, but rather as an indication that students have acquired new competencies relevant to their post-graduation lives. Importantly, student satisfaction should not be equated with the successful implementation of a learning system; it represents only one of many variables related to the overall effectiveness of the system. Student satisfaction often reflects preferences for certain aspects of learning rather than the essential competencies

they are expected to develop, such as analytical skills in addressing social problems or behavioral habituation in everyday life (Siti Romlah, L., et al., 2025).

This implies that genuine student satisfaction is achieved when students gain outcomes that are meaningful for their lives, rather than merely administrative satisfaction centered on the fulfillment of learning objectives, program learning outcomes, sub-learning outcomes, or course learning outcomes. Consequently, increases in satisfaction do not necessarily correspond to gains in students' cognitive competencies. Students may understand what tasks they are required to complete without fully grasping the underlying rationale or academic reasoning processes involved.

At a more specific level, particularly in courses at UAA and PSU whose learning outcomes emphasize the internalization of values into students' daily lives, assessment development must extend beyond conventional academic measures. Assessments should be designed to capture students' everyday behaviors as manifestations of successful value internalization. Such assessments may include, for example, field observations of students' daily conduct. The rationale for this approach is to ensure that learning outcomes are not reduced to a purely technocratic and administrative interpretation of OBE, but are instead evaluated substantively and holistically.

In a global context, these findings align with prior studies reporting positive effects of integrating OBE and e-learning on students' learning experiences (Akir et al., 2012; Mallikarjuna et al., 2021; Xiong et al., 2024). However, the primary contribution of this study does not lie in reiterating normative claims that OBE and e-learning are inherently "successful," but rather in providing cross-national empirical evidence from Southeast Asia demonstrating that the impact of OBE and e-learning is highly contingent upon initial institutional conditions, digital readiness, and academic cultural contexts (Qassrawi & al Karasneh, 2025). Thus, the novelty of this study lies in its comparative, student-experience-based perspective, which remains relatively underrepresented in the OBE literature in this region. This study is expected to encourage higher education institutions in both countries—and more broadly across ASEAN—to develop high-quality OBE- and e-learning-based curricula, particularly in archipelagic contexts such as Indonesia, where digital learning can play a critical role in extending equitable access to quality education in remote areas.

From a policy perspective, the findings suggest that OBE and e-learning implementation should not follow a standardized, one-size-fits-all approach. Higher



education institutions must tailor OBE design to students' readiness levels, learning cultures, and lecturers' capacities in digital pedagogy. OBE and e-learning have the potential to serve as effective strategies for enhancing and sustaining learning quality, but only when supported by authentic assessment practices and more comprehensive measurement of learning outcomes. Professional development for lecturers is therefore essential, particularly in designing high-quality instructional strategies that foster higher-order cognitive competencies. Learning systems should not only be accessible and engaging, but also ensure the delivery of high-quality content.

Government support is also crucial in providing infrastructure to sustain OBE curricula supported by e-learning, particularly given the dependence of e-learning on reliable internet access. Without adequate connectivity, such initiatives cannot function effectively. Expanding equitable internet access to remote areas would significantly help governments improve the quality of education. Through OBE-supported e-learning, affordable and high-quality education can be made accessible to all citizens, eliminating the need for students in remote communities to travel to urban centers solely for internet access. The effectiveness of e-learning lies precisely in its ability to reach learners broadly and equitably. Government commitment in this regard serves as tangible evidence of the state's responsibility to ensure equal and fair access to quality education.

This study also acknowledges several limitations. The use of a quasi-experimental design without randomization, reliance on student satisfaction data, and a relatively short observation period limit the strength of causal inferences. Additionally, socio-cultural differences in expressing satisfaction may influence cross-institutional comparisons. Future research should therefore combine satisfaction measures with more direct indicators of learning outcomes, such as academic performance, authentic assessments, or measures of cognitive presence, while employing longitudinal and cross-cultural research designs. Such approaches are necessary to produce deeper and more robust insights.

Through these directions, discourse on OBE and e-learning can move beyond the question of "whether students are satisfied" toward a deeper understanding of "how and to what extent OBE genuinely enhances learning quality". This study is expected to stimulate further in-depth research on the implementation of OBE and e-learning in higher education and other educational settings from diverse perspectives and analytical domains.

D. Conclusion

This study confirms that integrating Outcome-Based Education (OBE) with e-learning significantly enhances students' learning experiences, as reflected in increased levels of student satisfaction at Universitas Alma Ata (Indonesia) and Prince of Songkla University (Thailand). Beyond demonstrating positive outcomes, the findings reveal that the effectiveness of OBE and e-learning is strongly influenced by initial institutional conditions. This integration serves as a catalyst for quality improvement in contexts with moderate baseline quality, while also acting as a stabilizing mechanism in institutions that already exhibit strong learning quality.

The principal contribution of this study lies in its provision of cross-national empirical evidence centered on student experiences in Southeast Asia—a region where OBE research remains relatively limited and predominantly policy-oriented. By foregrounding student responses, this study extends the OBE discourse beyond curriculum design and institutional compliance, illustrating how OBE and e-learning operate within real learning contexts characterized by varying levels of digital readiness and academic culture. The findings underscore that OBE is not a uniform model, but rather a flexible and adaptive framework when supported by adequate digital infrastructure.

From a policy standpoint, the results highlight the importance for higher education institutions in Southeast Asia to strengthen alignment between program learning outcomes and digitally supported assessment practices, invest in faculty capacity development in digital pedagogy, and ensure more equitable access to learning technologies. These measures are essential not only for enhancing student satisfaction but also for reinforcing the quality assurance agenda embedded within OBE implementation.

At the same time, this study recognizes that student satisfaction, while informative, represents only one dimension of educational quality. Future research should move beyond perceptual indicators by integrating direct measures of learning outcomes, employing longitudinal designs, and conducting rigorous cross-cultural instrument validation. Such research directions are crucial for developing a more comprehensive and sustainable understanding of the role of OBE and e-learning in supporting higher education reform in Southeast Asia and globally.

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Declaration of Competing Interest

The authors declare that they have no known competing financial or non-financial interests that could have appeared to influence the work reported in this paper.

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