International Journal of Learning, Teaching and Educational Research
Vol. 25, No. 5, pp. 617-641, May 2026
https://doi.org/10.26803/ijlter.25.5.27
Received Feb 26, 2026; Revised Apr 21, 2026; Accepted Apr 28, 2026

Online Professional Development for Technology-Enhanced Education: A Learning Management System-Based Online Professional Development Initiative in the Maldives

Rozniza Zaharudin* **and Fathimath Nasiha Abdul Muhaimin**
Universiti Sains Malaysia
Penang, Malaysia

Abstract. This study addresses a documented gap in higher education professional development in the Maldives; the limited availability of context-specific, pedagogically focused online professional development (OPD) that supports university instructors' meaningful use of learning management system (LMS) beyond basic technical training. Although LMS platforms are widely adopted, instructors' pedagogical integration remains inconsistent, particularly in geographically dispersed small island developing states (SIDS) contexts. The primary objective of this study was to design, implement, and evaluate a self-paced, LMS-based (Moodle), online professional development E-module to enhance instructors' pedagogical use of Moodle. The E-module was developed using the Analysis, Design, Development, Implementation, Evaluation (ADDIE) model, constructivist learning and the Community of Inquiry (CoI) framework, and evaluated with the Unified Theory of Acceptance and Use of Technology (UTAUT). A mixed-methods design combined a needs analysis (N = 43), development records, usage evidence, a UTAUT survey of instructors who completed the E-module, and instructor interviews. A total of 73 instructors enrolled in the OPD module; 61 instructors enrolled in the module and 59 completed the E-module and the UTAUT survey. The study provides robust evidence that a contexxtualised, design driven OPD model can effectively support scalable professional development and sustained LMS adoption in dispersed higher education contexts. While limited by its single-context focus and reliance on self-reported data, the study offers transferable design guidelines and highlights the need for future research examining long-term instructional and student learning impacts.

Keywords: UTAUT; ADDIE; small island developing states (SIDS); LMS-based learning; technology acceptance; instructor development

Citation:
Zaharudin, R., & Abdul Muhaimin, F. N. (2026). Online Professional Development for Technology-Enhanced Education: A Learning Management System-Based Online Professional Development Initiative in the Maldives. *International Journal of Learning, Teaching and Educational Research*, *25*(5), 617–641. https://doi.org/10.26803/ijlter.25.5.27

*Corresponding author: Rozniza Zaharudin; *name@abc.com*

1. Introduction

The expansion of digital technologies has reshaped higher education teaching, increasing demand for instructors who can integrate pedagogy, content, and technology effectively (Diệp & Duong, 2023; Muñoz González & Quiroz, 2019). Research indicates that these pedagogical, technological, design, social, and assessment competencies require structured professional development rather than relying on informal experience alone (Godsk & Nielsen, 2024; Mujallid, 2021).

In response, higher education institutions are increasingly adopting online and blended professional development (OPD) to build instructors' digital teaching capacity (Zhang et al., 2025; Godsk & Nielsen, 2024; Gregory & Salmon, 2013; Lazarinis et al., 2025). However, many OPD initiatives remain fragmented, tool-focused, and poorly aligned with teaching contexts (Biasutti et al., 2021; Leary et al., 2020; Bitakou et al., 2023). Reviews of MOOCs similarly report gaps in key digital competencies, particularly in terms of their design for interaction and online assessment (Godsk & Nielsen, 2024).

Design and contextual shortcomings limit participation, sustained engagement, and transfer of professional development into practice (Fahruddin & Saefudin, 2025). The efficacy of OPD is shaped by infrastructure, workload, collaboration opportunities, and alignment with local needs and technologies (Zhang et al., 2025; Wynants & Dennis, 2018; Korkmaz & Bilgin, 2023). COVID-19 research further demonstrates that the development of digital competence is highly contextual (Mesuwini & Mokoena, 2024). Although interest in structured OPD has grown, evidence from small island developing states (SIDS) remains limited (Zhang et al., 2024). The Unified Theory of Acceptance and Use of Technology (UTAUT) provide a robust framework for examining instructors' acceptance of and sustained engagement with such modules (Venkatesh et al., 2003).

Although online and blended learning are expanding in Maldivian higher education, the use of learning management systems (LMSs)—particularly Moodle—remains largely restricted to content delivery and administration, with limited pedagogical use of interactive, collaborative, and analytic features (Pozo-Sánchez et al., 2022). This gap underscores the need to reposition the LMS as an integrated pedagogical environment supporting interaction, assessment, and learning analytics.

This study responds to the identified gap by reporting the design and evaluation of a Moodle-based OPD E-module intended to bridge the disconnect between existing LMS practices and pedagogically meaningful use. The module is guided by the Analysis, Design, Development, Implementation, Evaluation (ADDIE) instructional design model, grounded in adult learning theory, and anchored within the community of inquiry (CoI) framework. Usability and acceptance of the OPD e-module were assessed using UTAUT.

Consistent with local and global literature, LMS usage among Maldivian instructors similarly skews towards basic content distribution, with limited use of interactive, analytic, and assessment features, underscoring the need for targeted and scaffolded OPD initiatives rather than one-off technical training sessions (Ali, 2025; Waheed & Seddon, 2019).

Research indicates that technology acceptance is strongly influenced by the quality of learning design. Well-structured, contextually aligned professional development (PD) enhances a perception of its usability. Design elements such as clear structure, authentic tasks, collaboration, and institutional support are critical for sustained participation (Zhang et al., 2024; Garone et al., 2022). In the Maldives LMS usage is further shaped by cultural practices and limited training (Waheed & Seddon, 2019; Adam, 2017).

Positioning technology acceptance as a conceptual bridge between OPD design and sustained LMS use, this study applies the UTAUT constructs of Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI) and Facilitating Conditions (FC), to guide the development of a self-paced OPD e-module for higher-education instructors in the Maldives. As digital leaning expands, instructors require competencies in online course design, assessment, facilitation, and student engagement (Adam, 2017; Kinaanath, 2013). Without systematic, contextually responsive OPD that addresses both instructional design quality and technology acceptance, institutions, especially in SIDS, risk limitations in the sustainability and effectiveness of digital teaching practices.

By focusing on the Maldivian higher-education context, this study extends the predominantly global OPD literature by providing insights from a SIDS setting, where structural constraints and contextual factors necessitate tailored professional development approaches (Waheed & Seddon, 2019). This paper first reviews relevant literature on online professional development and LMs use, then details the design and development of the Moodle-based OPD E-module and research methodology, followed by the presentation of findings, discussion of implications for practice and policy and conclusions outlining limitations and directions for future research.

2. Literature Review

Rapid developments in educational technologies and the increasing availability of online resources have expanded professional learning beyond traditional formats. OPD has become integral to higher-education institutions seeking to enhance teaching quality and sustain instructor engagement in digitally enhanced environments. The UTAUT provides a useful lens for understanding instructors' acceptance of OPD, positing that PE, EE, SI, and FC shape behavioral intention and use (Jianey & Govender, 2021). Prior professional development experiences and beliefs further influence acceptance, underscoring the need for purposeful and continuous OPD as technologies and pedagogies evolve. Despite growing interest in OPD, few studies integrate instructional design frameworks (e.g., ADDIE, CoI) with technology acceptance models such as the UTAUT, particularly in SIDS like the Maldives. Existing UTAUT research often examines acceptance in

isolation, while LMS-based OPD studies focus on satisfaction rather than design-acceptance relationships.

2.1 Theoretical Frameworks: Instructional design for OPD and learning transformation

The purpose of this study was to design, implement, and evaluate an LMS-based OPD module for higher-education instructors using an integrated theoretical framework. This framework brings together instructional design (ADDIE), learning experience design (CoI), adult learning theory, and technology acceptance (UTAUT) to address both how OPD is designed and why instructors accept and use it. This study conceptualizes instructional design quality as a precursor to technology acceptance, with ADDIE and CoI shaping the perceptions of usefulness, ease of use, social influence, and facilitating conditions (Pozo-Sánchez et al., 2022).

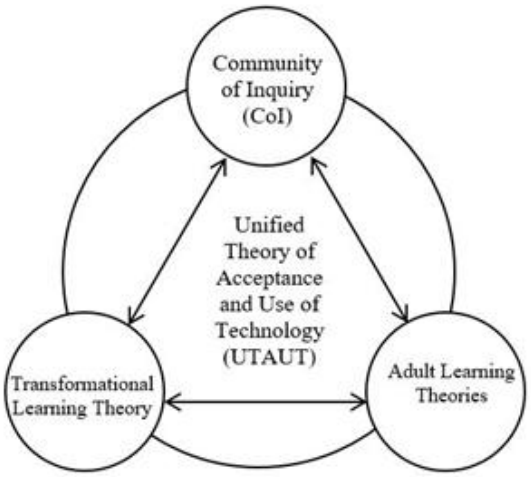


Figure 1: Theoretical Framework

Instructional systems design (ISD) provides a structured yet flexible process for digital learning (Abuhassna et al., 2024). In online and distance education, ADDIE has been widely adapted to LMS-mediated, multimedia rich, networked environments, reflecting a shift from content-centric to learner-centered technology integrated designs (Özkan et al., 2025).

Adult learning theories form the pedagogical foundation of the OPD module, recognizing instructors themselves as adult learners with established professional identities, time constraints, and experiential knowledge. Andragogy emphasizes autonomy and relevance; self-directed learning underscores goal setting, monitoring, and reflection; experiential and problem-based approaches stress cycles of practice, reflection, and experiential learning-support cycles of practice, feedback, and redesign of teaching approaches. In this OPD, instructors engage as reflective practitioners, drawing on their own teaching contexts to complete authentic design tasks, thereby aligning professional development with adult learners' needs for control, relevance, and respect for prior experience (Fahruddin & Saefudin, 2025; Biasutti et al., 2021).

The CoI framework conceptualizes meaningful online learning as the integration of teaching presence, social presence, and cognitive presence, moving learners through the practical inquiry phases of triggering → exploration → integration → resolution (Garrison et al., 2000). In OPD contexts, CoI supports a shift from content consumption to collaborative, inquiry-oriented learning by aligning tasks, facilitation, and professional dialogue with practice (Martin, 2022; Castellanos-Reyes, 2020; Shea et al., 2022).

In this study, ADDIE and the CoI framework are not used as complementary layers of instructional design. While ADDIE structures the development process and CoI orchestrates learning interactions, transformative learning provides the change mechanism through critical reflection, discourse, and action (Mezirow, 1991). In technology-related OPD, transformation often involves questioning beliefs about teaching with digital tools and moving toward learner-centered, evidence-based practices (Nair et al., 2025). Well, designed OPD can scaffold reflective inquiry and the development of professional identity, although such transformative outcomes are often inferred rather than directly measured.

LMS-based OPD provides a structured yet flexible environment for instructors' professional learning, allowing asynchronous engagement, collaborative knowledge construction, and sustained access to resources (Spatioti et al., 2022; Abuhassna et al., 2024; Nair et al., 2025). Unlike ad-hoc workshops, LMS-based OPD enables iterative cycles, analytics-informed facilitation, and alignment with institutional teaching strategies. In this study, the LMS functions not only as a delivery platform, but as a learning ecology that integrates content, interactions, and assessment to support professional growth.

2.2 OPD – Acceptance and Use

The expansion of MOOCs and digital platforms has increased users' access to flexible professional learning, but the efficacy of OPD depends on design quality, usability, and satisfaction (Prestridge, 2015; Hostetter, 2022). Consequently, effective OPD requires sound pedagogy, intuitive platforms, just-in-time support, and ongoing scaffolding to promote engagement and transfer to practice (Bragg et al., 2021). Technology acceptance models, including TAM and UTAUT, explain how perceived usefulness and ease of use shape behavioral intentions and remain highly relevant in higher education, where sustainable OPD depends on an alignment between institutional strategies and faculty motivations (Bayaga, 2024; Venkatesh et al., 2003; Shinsky, 2011).

Performance expectancy consistently predicts OPD participation, as instructors engage when they anticipate improvements in the effectiveness of their teaching and professional growth (Wang, 2024; Miah et al., 2023). However, sustained use depends on supportive design and enabling conditions. EE is particularly influential during early adoption, with intuitive interfaces, clear workflows, and structured onboarding strengthening satisfaction and continued engagement (Chen et al., 2021). SI and FC — such as leadership support, infrastructure, time, and technical assistance — further enable the translation of intention into use, especially in voluntary or self-paced contexts. Overall, while instructionally

robust and well-supported OPD is critical for sustainability, limited research has examined how integrated instructional design frameworks shape technology acceptance in LMS-based OPD, particularly in developing higher-education contexts.

To address these gaps, this study is guided by the following research questions:

- How can the ADDIE (Analysis, Design, Development, Implementation, Evaluation) model be applied to systematically develop an OPD e-module for online teaching?
- How can the OPD e-module be evaluated in terms of usability, acceptance, and user experience? Specifically:

a. How do instructors perceive the usability of the OPD e-module in terms of the UTAUT constructs of Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC)?
b. To what extent do these UTAUT constructs predict instructors' Behavioral Intention (BI) to use, and their actual Use Behavior (UB) of the OPD e-module?

3. Methodology

3.1 Research Design

This study employed a Design and Development Research (DDR) approach using an explanatory QUAN-qual embedded mixed-methods design to develop and evaluate a Moodle-based OPD e-module for higher education instructors. The research design followed sequential and evaluative logic, in which instructors' PD needs informed the design and development of the e-module, followed by implementation and empirical evaluation. The quantitative strand was dominant and was used to assess instructors: acceptance of, usability perceptions of, behavioral intentions around and use of the OPD e-module through the UTAUT framework. Qualitative data were embedded to contextualize and explain the quantitative findings. Although the overall study adopted a mixed-methods approach, the present paper reports only the quantitative findings, as the qualitative findings have been reported in a separate paper.

The research integrated the ADDIE instructional design model as the core development framework and used the UTAUT as the primary evaluative lens, supported by qualitative inquiry to capture instructors' experiences. The design served four objectives: (1) to identify higher-education instructors' PD needs regarding online and blended teaching; (2) to design and develop an OPD e-module grounded in ADDIE and informed by instructional design principles; (3) to implement and evaluate the e-module through UTAUT constructs — PE, EE, SI, and FC; and (4) to explore instructors' perceived benefits, challenges, and improvement suggestions to generate a holistic understanding of the module's effectiveness.

The study was conducted across four interconnected phases:

- Phase 1: Analysis
  This involved a mixed methods needs assessment combining a cross-sectional survey and semi-structured interviews to identify instructors and PD needs related to using LMs online and blended teaching.

- Phase 2: Design and Development
  This involved the design and development of a modular, Moodle-based OPD e-module guided by the ADDIE framework and informed by adult learning theories and the CoI framework.
- Phase 3: Implementation
  This involved implementation of the e-module with higher education instructors.
- Phase 4: Evaluation
  This involved quantitative evaluation of user acceptance and intended use through a UTAUT-based questionnaire, supported by qualitative focus group discussion.

The analysis phase employed a mixed-methods needs assessment using surveys and semi-structured interviews to identify competency gaps, contextual constraints, and support needs among Maldivian higher-education instructors. These findings informed the design and development phase, resulting in a modular Moodle-based e-module grounded in adult-learning principles, the CoI framework, Universal Design for Learning, and clearly specifying interface and assessment features.

Implementation and evaluation involved piloting the e-module and administering a UTAUT-based survey to assess acceptance, behavioral intention, and use behavior, complemented by focus-group discussions on usability and user experience. Qualitative and quantitative data were integrated through convergent triangulation, enabling nuanced interpretation of adoption patterns and areas for improvement. This pragmatic QUAN-qual design recognizes that faculty acceptance of self-paced OPD cannot be fully understood through a single data source. However, this paper presents only the quantitative findings of the study to maintain analytical focus and comply with article length requirements.

3.2 Participants and Sampling

Participants were higher-education instructors recruited following ethical approval through official university channels and follow-up awareness workshops. Participation was voluntary, and informed consent was obtained from all participants. In total, 73 instructors enrolled and were granted access to the OPD e-module; of these, 59 completed the module, while 14 did not. Participants represented diverse academic disciplines and levels of teaching experience, reflecting institutional diversity.

Attrition was assessed at two stages based on OPD e-module completion and survey response. Module completion resulted in an 80.82% completion rate (n = 59) and 19.18% attrition. All instructors who completed the e-module also completed the evaluation questionnaire, yielding a 100% survey response rate among completers, with no further attrition observed. Reported reasons for non-completion included workload demands, time constraints, and competing professional responsibilities, which are common in voluntary PD contexts.

3.3 Data Collection and Analysis

Quantitative data were collected using an adapted UTAUT-based survey (Venkatesh et al., 2003) to examine how PE, EE, SI and FC predict instructors' BI and use of online PD. The original 29 items were minimally modified and face-validated by two institutional experts, resulting in a final instrument of 23 Likert-scale items measuring PE, EE, SI, FC, BI, and UB. Responses were recorded on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). Demographic data, including gender, age, qualifications, and teaching experience, were also collected. A total of 59 instructors completed the UTAUT questionnaire, corresponding to all OPD e-module completers.

Quantitative data from the online UTAUT-based survey were collected through Google Forms, exported to Microsoft Excel, and the cleaned quantitative data were imported into IBM Statistical Package for Social Sciences (SPSS) for statistical analysis. Normality testing was conducted to determine the suitability of parametric tests, following guidance that normality checks help decide between parametric and non-parametric analyses. Following confirmation of acceptable distributional properties, correlation and multiple regression analyses were performed to examine the relationships among the UTAUT constructs and their predictive influence on instructors' BI and use of the OPD e-module. Responses from 59 participants constituted the final analytical sample, and this sample was used for all inferential statistical analyses reported in this paper.

The researcher was professionally situated within the higher education context under study, providing contextual familiarity. To mitigate potential bias, standardized instruments, transparent data collection procedures and analysis were employed, with qualitative findings used to contextualise rather than supersede quantitative results.

4. Results and Findings

4.1 Quantitative Findings

Overall, the instructors viewed the OPD e-module positively across the UTAUT constructs. Table 4.1 presents the descriptive statistics, means and standard deviations) for all the quantitative variables.

Table 4: Descriptive statistics for the UTAUT constructs

Construct	N	M	SD
Performance Expectancy (PE)	59	4.33	0.82
Effort Expectancy (EE)	59	4.28	0.81
Social Influence (SI)	59	3.76	0.82
Facilitating Conditions (FC)	59	3.87	0.86
Behavioral Intention (BI)	59	4.31	0.87

Note: This table presents the means (M) and Standard deviations (SD) for Performance Expectancy (PE), Effort Expectancy (EE), social Influence (SI), Facilitating Conditions (FC), Behavioral Intentions (BI), and Use Behavior (UB). Higher mean values indicate more positive perceptions of the OPD e-module across constructs.

PE and EE were both high (M = 4.33), indicating that participants perceived the module to be useful for PD and easy to use (see Table 4.1). SI was moderately positive (M = 3.76), reflecting some encouragement from supervisors, colleagues, and institutional actors (see Table 4.1). FC were moderately to strongly endorsed (M = 3.88), suggesting that resources, time, and technical support were reasonably available (see Table 4.1). BI to use the module was strong (M = 4.31) and UB reflected high self-reported uptake (M = 4.07) as summarized in Table 4.1. Taken together, the pattern—high PE and EE, with moderately positive SI and FC—matches typical technology acceptance profiles in which perceived usefulness and ease of use are primary drivers, reinforced by adequate support and social endorsement.

Table 4: Pearson correlation matrix for key study variables

Variables compared	r	P value	Interpretation
PE ↔ BI	.745	< .05	Strong positive
EE ↔ BI	.754	< .05	Strong positive
SI ↔ BI	.565	< .05	Moderate positive
FC ↔ UB	.533	< .001	Moderate positive
BI ↔ UB	.868	< .001	Very strong positive

Note: Values represent Pearson's correlation coefficients among UTAUT constructs. All reported correlations are positive and statistically significant. The very high correlation between Performance Expectancy (PE) and Effort Expectancy (EE) indicates substantial shared variance and was considered in assessing multicollinearity in regression analyses.

These results support three conclusions. First, intention to use the e-module was most strongly associated with ease of use (EE) and usefulness (PE), while there was a meaningful, though smaller, association with SI. Second, actual use (UB) was tightly coupled with intention (BI), consistent with the UTAUT's behavioral chain in which intention is the most proximal predictor of use. Third, FC matter for usage: even when intention is high, usage benefits from resource availability, time, and support. However, the correlation matrix also reveals a very high association between PE and EE (r = .905), which warrants consideration of potential multicollinearity in subsequent regression analyses.

As illustrative effect sizes, BI explains ~75% of the variance in UB ($r^2 = .868^2 = .754$), and FC explains ~28% ($r^2 = .533^2 = .284$), underscoring BI's dominant role and FC's secondary but enabling function. To evaluate predictive power, a multiple regression model tested PE, EE and SI as simultaneous predictors of BI.

Prior to interpretation, multicollinearity diagnostics were examined. The model was statistically significant and substantively large—$R = .799$, $R^2 = .638$, Adjusted $R^2 = .618$, $F(3,55) = 32.299$, $p < .001$—indicating that ~64% of the variance in BI was accounted for by the three predictors combined. Variance Inflation Factor (VIF) values were inspected to assess multicollinearity and were within acceptable thresholds, indicating that collinearity did not invalidate the overall model, despite high shared variance between PE and EE. The presence of multicollinearity does not weaken the explanatory power of the model but limits strong claims about the relative importance of PE versus EE; instead, the findings indicate that a combined perception of usefulness and ease of use is critical in shaping behavioral intention.

Consistent with the correlational pattern, EE emerged as the strongest unique predictor of BI in the multivariate context, with PE close behind, and SI contributing a smaller but still meaningful effect. Notably, multicollinearity between PE and EE ($r = .905$) reduced the unique statistical significance of individual predictors — especially PE — despite large bivariate correlations. This suggests that PE and EE explain largely overlapping variance in BI, and their effects should be interpreted jointly rather than as fully independent influences. Such overlap is common in acceptance research, where perceived usefulness and ease of use are conceptually and empirically intertwined.

This study employed a mixed-methods design; however, the qualitative data are not presented and discussed in this article. Qualitative data were collected to provide contextual depth and explanatory insight into instructors' experiences with the OPD e-module and were used during the interpretation phase to help explain observed quantitative patterns. Due to the scope and length of this paper, the qualitative findings have been excluded. In addition, they have been excluded to allow for more appropriate methodological depth while maintaining analytical clarity. Integration occurred at the interpretative level, where qualitative insights informed the discussion of quantitative results rather than serving as standalone findings in this article.

5. Limitations and Directions for Future Research

Despite its contributions, this study has limitations. It was conducted within a single Maldivian higher-education institution; while this offers insight into OPD in a SIDS context, it limits generalizability to institutions with different organizational cultures, resources, governance structures, or digital maturity. The study relied on self-reported measures of behavioral intention and use, which are consistent with UTAUT research but subject to response bias. The absence of objective indicators, such as LMS analytics, limits verification of actual engagement, skill transfer, or instructional change beyond the participants' perceptions.

Although the broader study adopted a mixed-methods design, this paper reports only on the quantitative findings, reducing explanatory depth regarding the instructors' interpretations of usability and contextual constraints. The modest sample size, while adequate for correlational and regression analyses, may also

limit representation across disciplines and levels of digital competence. Finally, evaluation occurred immediately after the module had been completed; therefore, the findings reflect short-term acceptance rather than long-term behavioral or instructional change. References to professional growth or transformative learning should be interpreted as inferential, as such outcomes were not directly measured. Future research should adopt longitudinal, cross-institutional designs and triangulate survey data with LMS analytics and qualitative inquiry to examine sustained adoption and instructional transformation.

6. Discussion

The findings indicate a strong acceptance profile for the OPD e-module. As shown in Table 4.1, instructors rated PE (M = 4.33) and EE (M = 4.28) highly, indicating the module was perceived as useful and easy to use. SI (M = 3.76) and FC (M = 3.87) were moderately positive, suggesting sufficient institutional and social support. This profile translated into strong BI (M = 4.31), signaling readiness for adoption. Inferential results reinforce this pattern. As shown in Table 4.2, BI correlated strongly with PE and EE (r = .75) and moderately with SI (r = .57), while UB correlated strongly with FC (r = .53). The regression model (Table 4.3) showed that PE, EE, and SI jointly explained 64% of the variance in BI (R^2 = .638), with EE emerging as the strongest predictor, followed closely by PE. The very high PE–EE correlation (r = .905) indicates substantial shared variance and reflects multicollinearity common in acceptance research.

Beyond confirming the UTAUT relationships, the findings offer contextual refinement by illustrating how acceptance mechanisms operate in instructor OPD within a SIDS. In the Maldivian higher-education context, EE slightly exceeding PE is particularly salient: geographically dispersed and resource-constrained systems make ease and feasibility more decisive than abstract usefulness. Reducing cognitive and operational effort through streamlined navigation, familiar LMS affordances, and clear task scaffolding therefore becomes a key driver of intention.

From an OPD design perspective, four priorities emerge. First, usefulness (PE) must be made explicit through authentic tasks and visible teaching benefits. Second, effort (EE) should be minimized via intuitive interfaces, simple workflows, and just-in-time support. Third, "easy to use" must translate into feasible creation, positioning FC as critical for sustained use. Fourth, social endorsement and support (SI and FC) should be strengthened through peer champions and active support structures. Sustained adoption also depends on professional identity development; reflective prompts and choice-based pathways can foster agency and ownership (Biasutti et al., 2021).

Theoretically, the study reinforces the UTAUT while highlighting an asymmetric effort profile: consuming content may require low effort but creating high-quality digital teaching artefacts demands stronger facilitating conditions, positioning FC as a crucial bridge between intention and sustained use.

Overall, the study makes four contributions: (1) extending the UTAUT by showing how design-level instructional decisions shape acceptance in faculty OPD; (2) providing empirical evidence from a SIDS context; (3) offering a validated, context-adapted UTAUT instrument with strong behavioral predictors; and (4) proposing a transferable design–evaluation model integrating ADDIE, CoI-based facilitation, and modular LMS design, positioning this case from the Maldives as theoretically and practically instructive.

7. Conclusion

Overall, the findings demonstrate strong instructor acceptance of the OPD e-module. High ratings for PE and EE indicate that instructors perceived the module as both valuable and easy to use — conditions that foster strong behavioral intention and meaningful follow-through in actual use (Pozo-Sánchez et al., 2022). Inferential results confirm that intention is primarily shaped by perceived usefulness, ease of use, and social influence, while actual use is driven by intention and supported by facilitating conditions. The very strong BI–UB relationship indicates that once instructors are convinced of value and feasibility, they act reliably on their intentions (Fahruddin & Saefudin, 2025).

Instructionally, the findings highlight the need to make usefulness tangible, reduce effort barriers, and support transitions from consuming to producing digital learning designs. Institutionally, sustained adoption depends on structural supports such as protected time, stable infrastructure, technical assistance, and clear governance mechanisms. Theoretically, the study reinforces the UTAUT while adding nuance regarding differentiated effort demands in professional learning contexts.

In sum, the OPD e-module shows strong acceptability and clear potential for sustained integration into practice. Long-term success will depend on maintaining high usability, strengthening support structures, and embedding the module within a socio-technical ecosystem that enables instructors not only to use high-quality digital learning designs, but also to create them confidently and consistently.

8. Conflict of Interest

The authors would like to acknowledge and thank the instructors who contributed their valuable time in participating in this study.

9. Acknowledgments

The authors wish to acknowledge the use of Microsoft Co-pilot in the writing of this paper. This tool was used to help improve the language and grammar and structure and presentation. Additionally, Microsoft Co-pilot was also used to review the tables and cross-check and verify the quantitative data presented in the paper. The paper remains an accurate representation of the author's work and intellectual contributions.

10. References

Abuhassna, H., Adnan, M., & Awae, F. (2024). Exploring the synergy between instructional design models and learning theories: A systematic literature review. Contemporary Educational Technology, *16*(2), Article ep499. https://doi.org/10.30935/cedtech/14289

Adam, A. (2017). A framework for seeking the connections between technology, pedagogy, and culture: A study in the Maldives. *Journal of Open, Flexible and Distance Learning, 21(*1), 35–51. https://doi.org/10.61468/jofdl.v21i1.280

Ali, R. (2025). How challenging? Barriers for teachers in institutional implementation of blended learning. Open Learning: *The Journal of Open and Distance Learning, 40*(3), 324–341. https://doi.org/10.1080/02680513.2024.2342922

Bayaga, A., & du Plessis, A. (2024). Ramifications of UTAUT among higher education staff in developing countries. *Education and Information Technologies, 29,* 9689–9714. https://doi.org/10.1007/s10639-023-12194-6

Biasutti, M., Concina, E., Frate, S., & Delen, I. (2021). Teacher professional development in intercultural education. *Sustainability, 13*(8), 4171. https://doi.org/10.3390/su13084171

Bitakou, E., Ntaliani, M., Demestichas, K., & Costopoulou, C. (2023). Assessing Massive Open Online Courses for Developing Digital Competences among Higher Education Teachers. *Education Sciences, 13*(9), 900. https://doi.org/10.3390/educsci13090900

Bragg, L. A., Walsh, C., & Heyeres, M. (2021). Successful design and delivery of online professional development for teachers: A systematic review of the literature. *Computers & Education, 166*, 104158. https://doi.org/10.1016/j.compedu.2021.104158

Castellanos-Reyes, D. (2020). Twenty years of the Community of Inquiry framework. *TechTrends, 64*, 557–560. https://doi.org/10.1007/s11528-020-00491-7

Chaharbashloo, H., Talebzadeh, H., Largani, M. H., & Amirian, S. (2024). Online teaching competencies in higher education: A systematic review. *Research and Practice in Technology Enhanced Learning, 19.* https://doi.org/10.58459/rptel.2024.19014

Chen, M., Xuan, W., Wang, J., Zuo, C., Tian, J., & Cui, Y. (2021). Factors affecting continuance intention for online learning platforms. *SN Computer Science, 2*(2). https://doi.org/10.1007/s42979-021-00498-8

Diệp, C., & Duong, O. (2023). Proposing a process for training online teaching competence for lecturers at higher education institutions. *Journal of Education and e-Learning Research, 10*(3), 502–512. https://doi.org/10.20448/jeelr.v10i3.4893

Fahruddin, F., & Saefudin, A. (2025). Primary sources in online history learning: Enhancing engagement and retention. *Cogent Education, 12*(1). https://doi.org/10.1080/2331186X.2025.2452087

Garone, Anja & Bruggeman, Bram & Philipsen, Brent & Pynoo, Bram & Tondeur, Jo & Struyven, Katrien. (2022). Evaluating professional development for blended learning in higher education: a synthesis of qualitative evidence. *Education and Information Technologies*. 27(6) 7599-7628. https://doi.org/10.1007/s10639-022-10928-6

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education. *The Internet and Higher Education, 2*, 87-105. http://doi.org/10.1016/S1096-7516(00)00016-6

Godsk, M., & Nielsen, B. (2024). Online teacher professional development (oTPD) for digital competencies in higher education: A systematic review of the literature. *Nordic Journal of Systematic Reviews in Education, 2,* 16–57. https://doi.org/10.23865/njsre.v2.5498

Gregory, J., & Salmon, G. (2013). Professional development for online university teaching. *Distance Education, 34*(3), 256–270. https://doi.org/10.1080/01587919.2013.835771

Hostetter, S.T. (2022). Developing a Quality Assurance Approach for an Online Professional Military Education Institution. *The Journal of Applied Instructional Design, 11*(2), 51-65. https://doi.org/10.59668/377.8134

Jianey, F., & Govender, I. (2021). Factors influencing secondary school teachers' beliefs and intention to accept online professional development: An empirical study in Mauritius. *Universal Journal of Educational Research, 9*, 880–890. https://doi.org/10.13189/ujer.2021.090422

Kinaanath, M. (2013). ICT use in higher education in the Maldives (Doctoral dissertation, Victoria University of Wellington). https://doi.org/10.26686/wgtn.17005597

Korkmaz, Z. S., & Bilgin, H. (2023). Developing the Digital Competencies of Instructors in the Process of Distance Education. *Research on Education and Psychology, 7*(Special Issue 2), 384-412. https://doi.org/10.54535/rep.1357889

Lazarinis, F., Panagiotakopoulos, T., Armakolas, S., Vonitsanos, G., Iatrellis, O. and Kameas, A. (2025), A Blended Learning Course to Support Innovative Online Teaching in Higher Education. *Eur J Educ, 60*: e12820. https://doi.org/10.1111/ejed.12820

Leary, H., Dopp, C., Turley, C., Cheney, M., Simmons, Z., Graham, C. R., & Hatch, R. (2020). Professional development for online teaching: A literature review. *Online Learning, 24(*4). https://doi.org/10.24059/olj.v24i4.2198

Martin, F., Wu, T., Wan, L., & Xie, K. (2022). Meta-analysis of the Community of Inquiry presences. *Online Learning, 26*(1). https://doi.org/10.24059/olj.v26i1.2604

Mesuwini, J., & Mokoena, S. (2024). Exploring online teaching and learning challenges for the technical and vocational education and training lecturer. *Journal of Education and e-Learning Research, 11*(1), 193–202. https://doi.org/10.20448/jeelr.v11i1.5423

Mezirow, J. (1991). Transformative dimensions of adult learning. Jossey-Bass.

Miah, M., Singh, J., & Rahman, M. (2023). Factors influencing technology adoption in online learning among private university students in Bangladesh post-COVID-19 pandemic. *Sustainability, 15*(4), 3543. https://doi.org/10.3390/su15043543

Mujallid, A. (2021). Instructors' readiness for online teaching in higher education. International Journal of Learning, *Teaching and Educational Research, 20*(7). https://doi.org/10.26803/ijlter.20.7.8

Muñoz González, L., & Quiroz, G. (2019). Instructional design in online education: A systemic approach. *European Journal of Education, 2(3*), 64–73. https://doi.org/10.26417/ejed.v2i3.p64-73

Nair, B. K. R., Bleasel, J., Mwangi, F., & Malau-Aduli, B. S. (2025). Reimagining faculty development: A paradigm shift from content to transformative learning processes. *Medical teacher, 47*(6), 976–984. https://doi.org/10.1080/0142159X.2024.2390035

Özkan, A., Çevik, İ., Saylan, E., & Çakıroğlu, Ü. (2025). Trends in instructional design for online learning. *International Review of Research in Open and Distributed Learning, 26*(3), 126–148. https://doi.org/10.19173/irrodl.v26i3.8507

Prestridge, S., & Tondeur, J. (2015). Exploring elements that support teachers' engagement in online professional development. *Education Sciences, 5(*3), 199–219. https://doi.org/10.3390/educsci5030199

Pozo-Sánchez, S., Segura-Robles, A., Moreno-Guerrero, A. J., & López-Belmonte, J. (2022). Benefits of LMS-based flipped learning. *Revista Electrónica de Investigación Educativa, 24*. https://doi.org/10.24320/REDIE.2022.24.E24.4094

Shea, P., Richardson, J., & Swan, K. (2022). Building bridges to advance the Community of Inquiry framework for online learning. *Educational Psychologist, 57*, 148 - 161. https://doi.org/10.1080/00461520.2022.2089989

Shinsky, J. (2011). Enhancing Online Instruction in Higher Education: Professional Development Strategies That Work. In T. Bastiaens & M. Ebner (Eds.), Proceedings of ED-MEDIA 2011--World Conference on Educational Multimedia,

Hypermedia & Telecommunications (pp. 3217-3221). Lisbon, Portugal: Association for the Advancement of Computing in Education (AACE). Retrieved April 20, 2026 from https://www.learntechlib.org/p/38315

Spatioti, A. G., Kazanidis, I., & Pange, J. (2022). A Comparative Study of the ADDIE Instructional Design Model in Distance Education. *Information, 13*(9), 402. https://doi.org/10.3390/info13090402

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478. https://doi.org/10.2307/30036540

Waheed, I., & Seddon, A. (2019). Utilisation and Challenges of the Learning Management System in the Higher Education Institutions in Maldivian. *International Journal of Information Technology Management and Information Systems, 10(*1), 1–10. https://doi.org/10.34218/ijitmis.10.1.2019.001

Wang, S. (2024). Exploring sustainable learning intentions of employees using online learning modules of office apps based on user experience factors: Using the adapted UTAUT model. *Applied Sciences, 14(*11), 4746. https://doi.org/10.3390/app14114746

Wynants, S., & Dennis, J. (2018). Professional development in an online context: Opportunities and challenges from the voices of college faculty. *Journal of Educators Online, 15*(1). https://doi.org/10.9743/JEO2018.15.1.2

Zhang, J., Huang, Y., Wu, F., Kan, W., & Zhu, X. (2025). Scaling up online professional development through institution-initiated blended learning programs in higher education. *The Internet and Higher Education, 65*, 100988. https://doi.org/10.1016/j.iheduc.2024.100988

Appendix 1

Validated instrument for survey questionnaire.

E-Module: Instructor Professional Development for Online Teaching in Higher Education

You are invited to take part voluntarily in research, E-module for Instructor Professional Development for Online Teaching at University. This research is about online professional development for online teaching and will examine the effectiveness of online professional development via an E-module using the Unified Theory of Technology Acceptance and Use of Technology, UTAUT Framework (Venkatesh, Morris, Davis, & Davis, 2003).

The objectives of this study is to determine the user's intention of using similar online professional development modules or E-modules for professional development of university instructors based on how users perceive effectiveness in relation to their work, the ease of use, and additional contextual and related factors such as the support of superiors, colleagues as well as other facilitating factors.

It is important that you read and understand this research information before agreeing to participate in this study. You will receive a copy of this form to keep your records if you agree to participate.

The E-module is designed as self-paced module where the participant will determine how long to complete the module. However, for the purposes of this research, your participation in this study is expected to be no more than 10 weeks and will include your enrollment and completion of the E-module, participating in the survey upon completion. You may also have the opportunity to take part in a focus group interview.

Your taking part in this study is entirely voluntary. You may refuse to take part in the study, or you may stop your participation in the study at any time, without any penalty or loss of benefits to which you are otherwise entitled. Your participation also may be stopped by the research team without your consent if in any form you have violated the study eligibility criteria. The research team member will be discussed with you if the matter arises.

Participants are expected to be involved for a duration of no more than 12- weeks; 10-12 weeks to complete the E-module and a duration of 2 weeks to complete the survey and participate in the focus-group interview.

Your participation period for this study will not exceed 10 weeks. Your participation in this study is required in the following ways:

Completing the E-module (set for a duration of 8 weeks maximum), you may complete the E-module any time within this duration.

Complete the survey questionnaire at the end of 8 weeks (will take between 20 to 30 minutes to complete)

Participate in a focus-group interview after the survey (will take between 20 to 40 minutes to complete).

You will not receive any compensation, financial or otherwise, from this study.

QUESTIONS

If you have any questions about this study or your rights, please contact;
[Name and Contact of Researcher]
If you have any questions regarding Ethical Approval or any issue / problem related to this study, please contact;
[Name and Contact]
OR
[Name and Contact]

CONFIDENTIALITY

Your information will be kept confidential by the researchers and will not be made publicly available unless disclosure is required by law.
Data obtained from this study that does not identify you individually will be published for knowledge purposes.
Your original records may be reviewed by the researcher, the Ethical Review Board for this study, and regulatory authorities for the purpose of verifying the study procedures and/or data. Your information may be held and processed on a computer. Only research team members are authorized to access your information.

SECTION 1- Consent

Question: Do you give consent to participate in the survey?
Yes
No

SECTION 2 – Demographics

Age

Under 30 years old
30 – 45 years old
46 – 60 years old
Over 60 years old

Gender

Male
Female

Experience

Less than 3 years
3 – 6 years
7 to 10 years
More than 10 years

SECTION 3 – Participant Experience of the E-Module

Rate your level of agreement for the following statements based on your experience of the E-Module:

Statement	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)
1. I would find online professional development (E-module) useful in my online teaching practice.					

2. The E-module enables me to master the instructional skills needed for online teaching more quickly					
3. Using online professional development (E-module) enables me to accomplish tasks more quickly.					
4. Using the online professional development (E-module) increases my confidence in online teaching.					
5. My interaction with online professional development (E-module) would be clear and understandable.					
6. It would be easy for me to become skilful at using online professional development (E-module.					
7. I would find online professional development (E-module) easy to use.					
8. Learning to operate online professional development (E-module) is easy for me.					
9. My Supervisor/H.O/D believe I should complete the E-module for online teaching.					
10. My colleagues believe I should complete the E-module for online teaching.					

11. The senior management of this institute has been helpful in the use of online professional development (E-Module).					
12. In general, I have been supported in completing the E-module					
13. I had the necessary resources to complete the E-module					
14. I found the time to complete this E-module.					
15.I received technical and other support to compete with the E-module.					
16. I intend to use similar E-modules for further professional development in online teaching					
17. I predict I would use similar E-modules in the near future					
18. I plan to use similar E-modules in the near future.					
19. I feel comfortable in using the E-module in the future					
20. I consider myself a regular user of online professional development programs					
21. I prefer to enroll in online professional development programs when available					
22. I complete most of my professional					

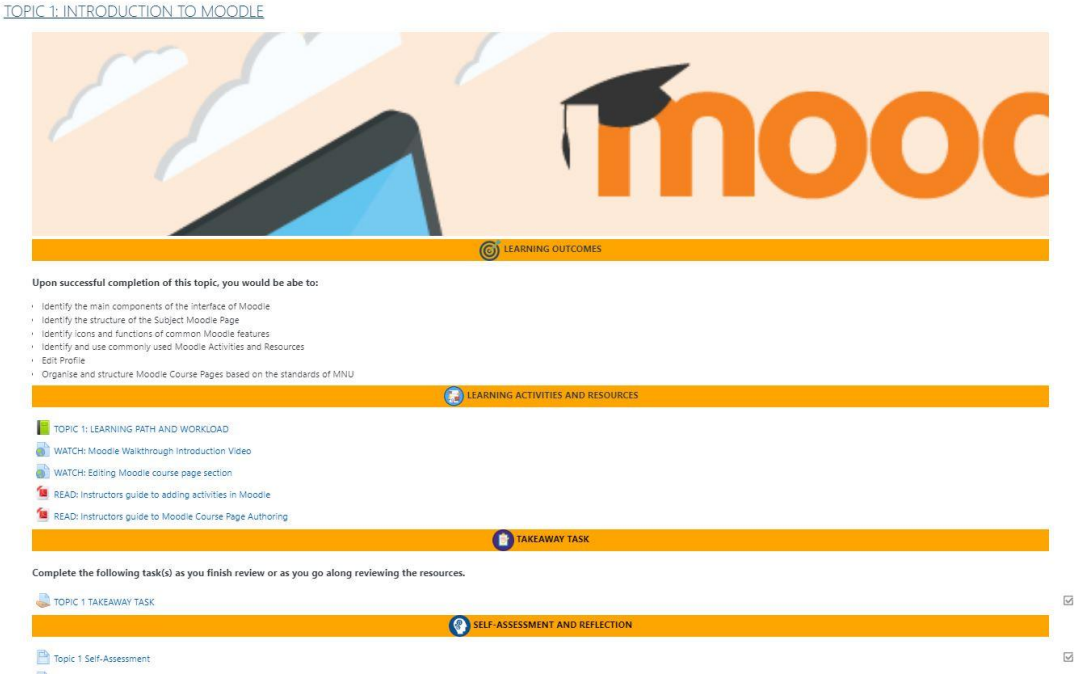
development via online programs					
23. My tendency is towards using online professional development programs whenever possible					

Appendix 2

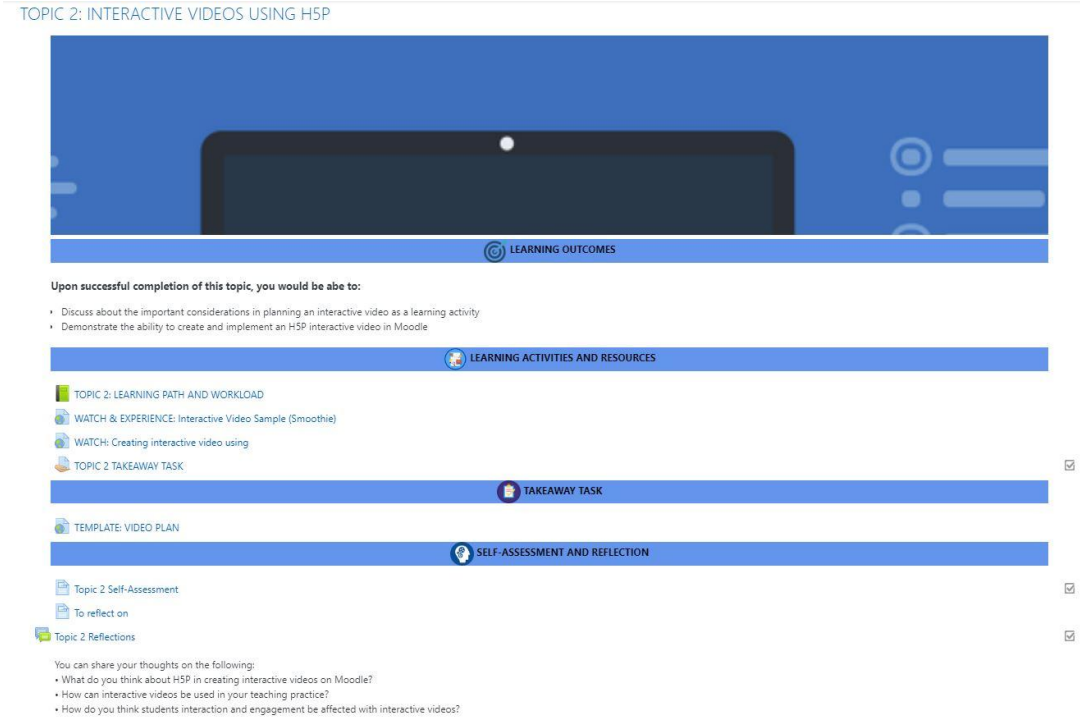
E-Module components snapshot

E-module Welcome & Orientation section

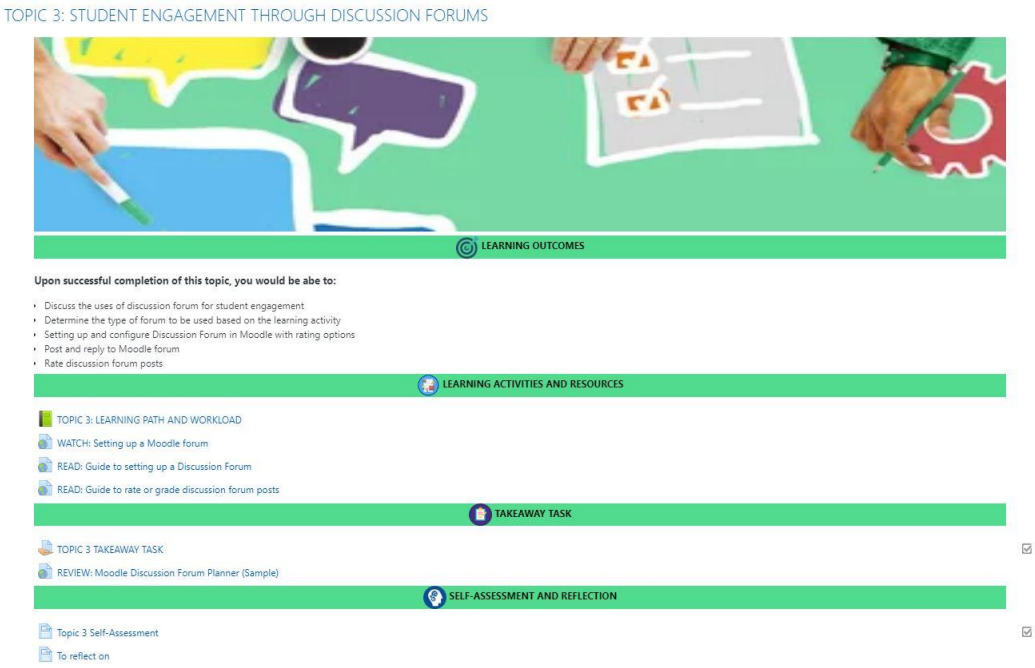
E-module Topic 1



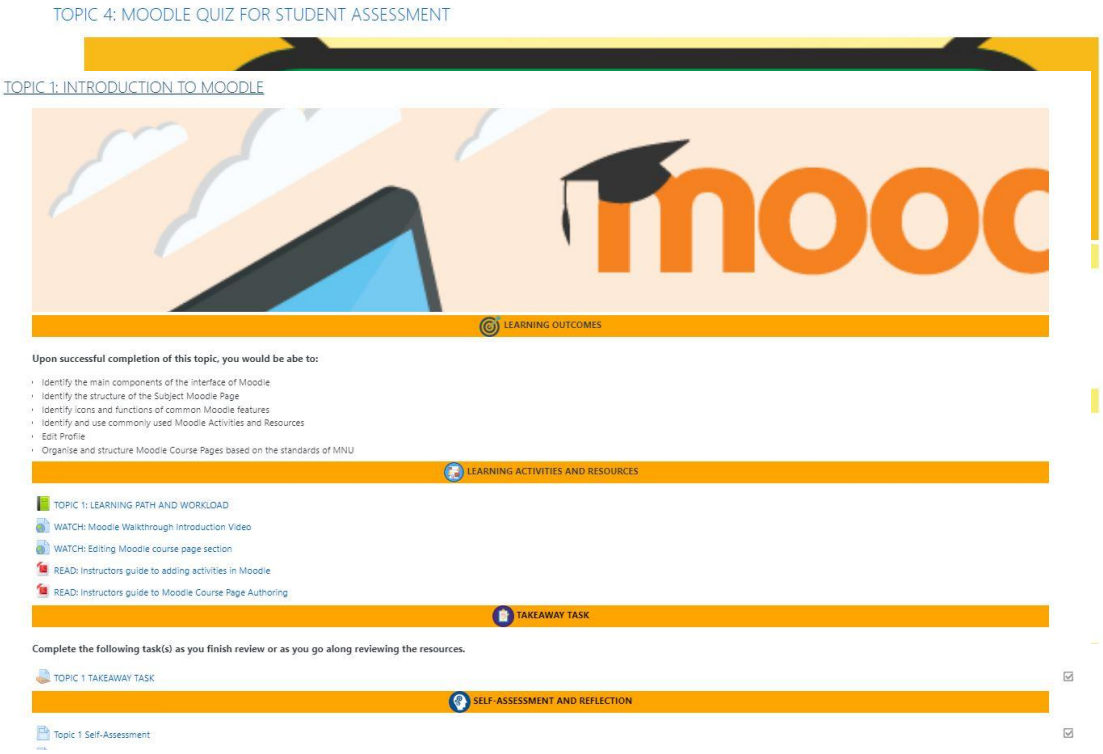
E- Module Topic 2



E-module Topic 3

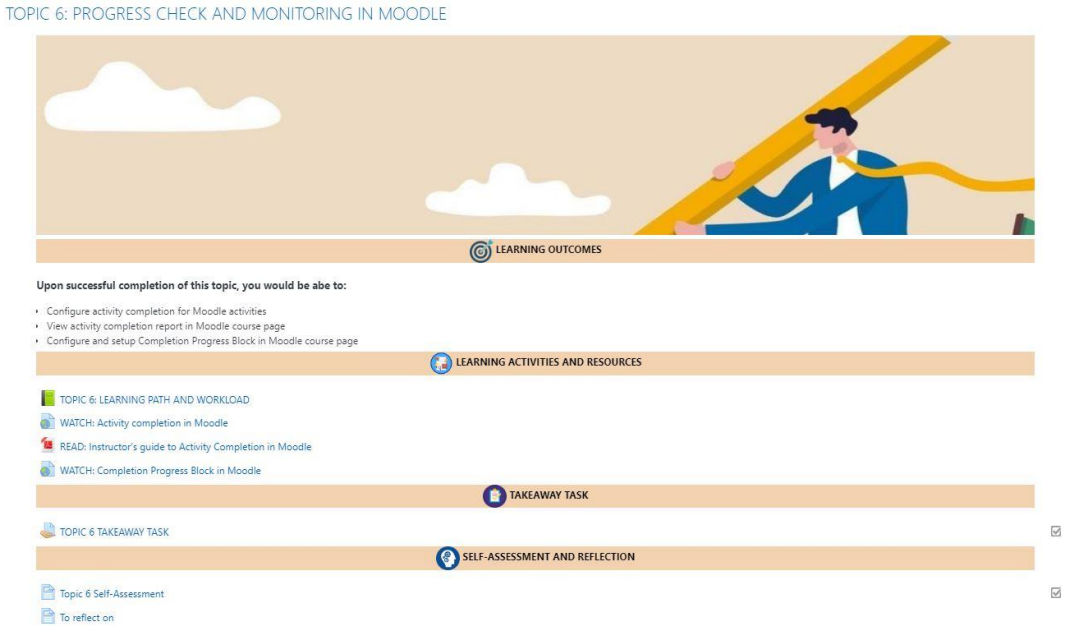


E- Module Topic 4

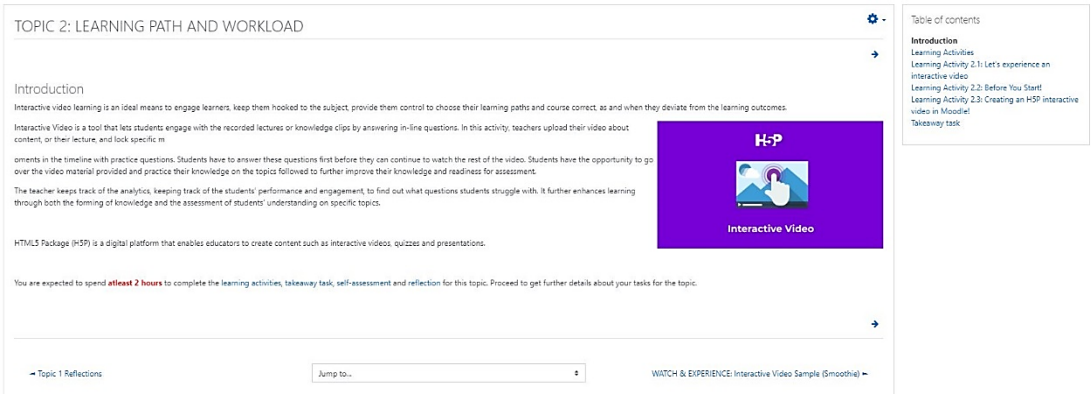


E-module Topic 5

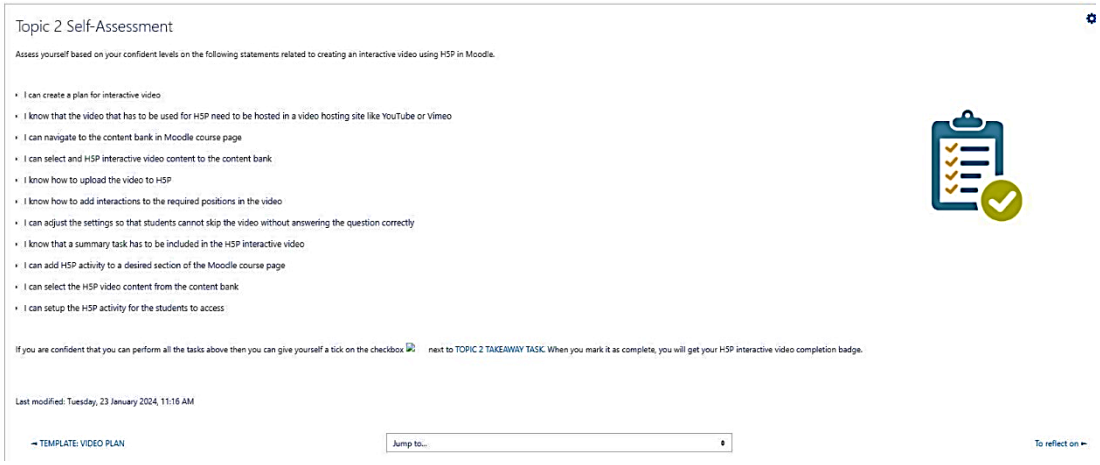
E- Module Topic 6



E- Module Topic Learning Path and Workload



E- Module Topic Self-assessment



E- Module Topic Reflection