

AI-Enhanced Learning Media for Buddhist Meditation Education: A Development Study in Higher Education

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Abstract

The rapid development of artificial intelligence (AI) has created new opportunities for higher education, particularly in the development of multimedia learning resources that can provide more flexible, accessible, and engaging learning experiences. However, the application of AI-generated learning media in Buddhist religious education, particularly Buddhist meditation education, remains relatively underexplored. This study aimed to develop and evaluate an AI-based learning medium for the *Samadhi* course, with particular emphasis on introductory Buddhist meditation material. A research and development approach based on the ADDIE framework was employed, consisting of analysis, design, development, implementation, and evaluation. The development process integrated several AI-supported tools for generating instructional text, visual assets, and presenter-based video content, followed by conventional video editing and integration. Data were collected through observation, interviews, expert evaluation, and student response questionnaires. The developed product was subsequently evaluated through individual, small-group, and field trials. The field implementation involved 12 students and produced an overall score of 89.35%, categorized in the original study as “very good” and “highly feasible.” Individual testing identified weaknesses primarily in language style and audio/music balance, which were subsequently revised. Small-group and field evaluations indicated improved perceptions of comprehensibility, visual quality, audio quality, and instructional usefulness. The findings suggest that AI can function not merely as a content-generation technology but as a component of an instructional design process for developing contextual multimedia learning resources in Buddhist higher education. Nevertheless, the study evaluates primarily perceived feasibility and usability rather than learning gains. Future research should therefore employ larger samples, comparative or quasi-experimental designs, and direct measures of learning outcomes.

Keywords: artificial intelligence; generative AI; learning media; Buddhist education; meditation education; higher education; instructional design

1. Introduction

Artificial intelligence (AI) is increasingly transforming the ways in which educational content is designed, delivered, and accessed. In higher education, AI-supported systems are being explored for content generation, personalization, feedback, assessment, learning analytics, and instructional design. Recent systematic reviews indicate that the application of generative AI in higher education is expanding rapidly, although its

implementation remains uneven across disciplines. Research has concentrated particularly on engineering, health, medicine, and language education, while humanities, social sciences, and other disciplinary contexts remain comparatively less represented. (Crompton & Burke, 2023; Wang et al., 2024).

The educational significance of generative AI extends beyond automated content production. AI tools can support the production of text, images, audio, and video,

thereby enabling educators to construct multimedia learning environments without requiring extensive technical expertise. At the same time, contemporary scholarship emphasizes that the educational value of AI depends substantially on how the technology is embedded within pedagogical design rather than on the technological capability of the tool itself. Recent reviews have identified instructional design, pedagogical scaffolding, verification, and contextualization as important conditions for meaningful educational use of generative AI. (Ouyang & Jiao, 2021; Yusuf et al., 2024).

This issue is particularly relevant to higher education in religious studies. Religious education often involves abstract concepts, experiential practices, ethical reflection, and forms of knowledge that cannot always be adequately communicated through conventional text-based or lecture-based instruction. Buddhist meditation education provides a particularly interesting context because students are expected not only to understand conceptual descriptions of meditation but also to engage with structured explanations and practices. (Crompton & Burke, 2023).

The research report underlying the present article identified limitations in the availability and use of instructional media for the *Samadhi* course. The study reported that conventional PowerPoint-based teaching did not fully address students' learning needs and that there was a need for more contemporary, accessible, and varied instructional media. The initial problem identification also included limitations in students' mastery of

course content, insufficient use of technology in learning, and the absence of AI-based learning media within Buddhist religious courses.

These conditions provided the rationale for developing an AI-supported multimedia learning resource for introductory Buddhist meditation. The resulting product was designed as a video-based learning medium that could be downloaded and accessed through computers, laptops, and smartphones. The development process combined several digital tools: ChatGPT for developing instructional descriptions, Leonardo.AI for generating visual materials, Hedra for producing character-based video, and Vegas Pro for integrating and editing the resulting multimedia components.

The study is also relevant to current discussions concerning responsible AI use in education. UNESCO emphasizes that generative AI should be incorporated through human-centred, pedagogically meaningful, ethical, safe, and equitable approaches rather than being treated simply as an autonomous replacement for educators. Thus, the role of AI in the present study is conceptualized as a developmental and assistive technology within an educator-led instructional design process. (Fu & Weng, 2024; Yusuf et al., 2024).

Despite growing international research on AI in education, empirical work concerning AI-supported instructional media for Buddhist higher education remains limited. A recent systematic review of generative AI applications in higher

education found substantial disciplinary variation and indicated that some fields remain underrepresented in empirical research. This creates an opportunity to examine how AI-supported multimedia development can be applied within a distinctive religious and contemplative learning context. (Yusuf et al., 2024; Baig & Yadegaridehkordi, 2024).

Accordingly, this study addressed three questions:

1. How can an AI-based learning medium for the *Samadhi* course be developed?
2. To what extent is the developed medium considered feasible by experts and students?
3. How do students respond to the developed medium during individual, small-group, and field evaluations?

The contribution of this study lies in documenting an AI-assisted instructional design process for Buddhist meditation education and providing empirical evidence concerning the feasibility and usability of the resulting learning medium.

2. Methods

2.1 Research Design

This study employed a research and development (R&D) approach. The development procedure followed the ADDIE framework, consisting of five stages: Analysis, Design, Development, Implementation, and Evaluation. The report describes ADDIE as a model suitable for developing instructional systems, including learning media and instructional materials.

The choice of ADDIE was consistent with the objective of producing an instructional product through an iterative process involving needs analysis, product design, development, implementation, and evaluation.

2.2 Research Context and Participants

The study was conducted at Sekolah Tinggi Agama Buddha Negeri Raden Wijaya, Wonogiri, Central Java, Indonesia, during 2024. The research focused on the *Samadhi* course, particularly introductory Buddhist meditation material. The research report identifies students as the primary users of the developed learning medium.

The evaluation process involved several stages. Individual testing involved three students, small-group testing involved eight students, and field testing involved 16 students who had not participated in the preceding two stages. In addition, the implementation-stage questionnaire reported responses from 12 students. Because the report uses different participant numbers across stages, the present article retains the numbers reported for each corresponding evaluation stage rather than treating them as one single sample.

2.3 Analysis Stage

The analysis stage began with observation and interviews conducted to identify students' learning needs and problems associated with existing instructional media. The interview was conducted on 8 April 2024 in the Ronggolawe classroom at STAB Negeri Raden Wijaya.

The analysis focused particularly on the use of PowerPoint as the existing instructional medium. The findings indicated a need for more contemporary instructional media and became the basis for developing an AI-supported learning resource.

2.4 Design and Development

The product was designed as a multimedia video-based learning resource. The instructional content was aligned with the course curriculum and developed for students in Buddhist religious education.

Four main digital tools were integrated into the development process:

1. ChatGPT used to generate and organize descriptions of instructional material.
2. Leonardo.AI used to generate visual and character-based assets.
3. Hedra used to transform text and visual character assets into presenter-based video.
4. Vegas Pro used to combine video components, add music/instrumental elements, and render the final product into MP4 format.

The final product could be accessed through computers, laptops, and smartphones.

This workflow illustrates an important distinction between AI-generated content and AI-assisted instructional design. Although several components were generated using AI, the final instructional product remained subject to human selection, editing, organization, and pedagogical adaptation. (Ouyang & Jiao, 2021; Fu & Weng, 2024).

2.5 Data Collection

Data were collected using observation, interviews, expert validation, and student questionnaires. The research instruments included an expert-media validation instrument, an expert-material validation instrument, and a student-response instrument.

The media expert instrument contained 15 items covering media suitability, menu completeness, navigation, typography, images, animation, color, presentation, screen quality, and ease of use. The material expert instrument consisted of 23 items covering presentation, content feasibility, language, usability, and instructional strategy. The student-response instrument contained 18 items covering material, narration, music/sound effects, and visualization.

2.6 Data Analysis

Quantitative data were analyzed descriptively using Likert-scale responses. The report employed a four-point scale for expert evaluation, ranging from 1 (“very poor/strongly disagree”) to 4 (“very good/strongly agree”). The feasibility classification used percentage ranges, with 81–100% categorized as “very good/very feasible.”

Student responses were also examined descriptively to identify strengths and aspects requiring revision. Qualitative observations and comments were used to guide product revisions following each stage of formative evaluation.

Importantly, because the study did not employ a control group or a pretest-posttest

learning-gain design, the term effectiveness in this article is interpreted cautiously as perceived instructional usefulness and feasibility rather than demonstrated causal improvement in learning achievement.

3. Results

3.1 Needs Analysis

The needs analysis revealed a limitation in the instructional media used for the *Samadhi* course. Existing learning activities relied substantially on PowerPoint presentations, while students required learning media that were more contemporary, accessible, and engaging.

The findings provided the rationale for developing a multimedia product using AI-supported technologies. The product was intended to complement rather than replace classroom teaching and could be used both for lecturer-led presentation and independent student learning.

3.2 Development of the AI-Based Learning Medium

The resulting product was a video-based instructional medium for introductory Buddhist meditation.

The development process began with instructional text generated and organized through ChatGPT. Visual components were then developed using Leonardo.AI. Hedra was used to create presenter-based video content from textual and visual inputs. Finally, Vegas Pro was used to combine the separate components, incorporate background music or instrumental elements, and produce the final MP4 learning resource.

This workflow allowed the researcher to combine generative AI with conventional multimedia editing. The final product was therefore not a fully autonomous AI-generated instructional system but a human-directed AI-assisted learning medium.

3.3 Student Response During Initial Implementation

During the larger implementation stage, 12 students completed the questionnaire. The total score was 772 out of a maximum possible score of 864, producing an overall percentage of 89.35%.

According to the classification adopted in the original study, this result falls within the “very good” and “very feasible” category.

Students evaluated five broad dimensions:

- instructional material;
- narration;
- music and sound effects;
- visualization; and
- presentation.

Students generally perceived the material as consistent with the learning objectives and easy to understand. They also responded positively to the language used, narration, visual quality, and overall presentation. (Chan & Hu, 2023).

3.4 Individual Evaluation

The first formative evaluation involved three students. The evaluation identified several areas requiring improvement.

The highest ratings were observed for:

- ease of understanding: 3.8;

- alignment with learning objectives: 3.6;
- appropriateness to student ability: 3.6;
- comprehensibility of language: 3.6; and
- attractiveness of captions/graphics: 3.6.

The lowest scores were observed for language style (2.6) and music/sound-effect volume (2.6). These results led to revisions in these two aspects before the next evaluation stage.

This finding demonstrates the value of iterative evaluation. Although the AI-assisted product was technically functional, user feedback revealed aspects of communication and audio design that could not be adequately determined from the development process alone.

3.5 Small-Group Evaluation

The second formative evaluation involved eight students. Following revision, the ratings improved substantially in the previously problematic areas.

The mean ratings included:

- ease of understanding: 3.6;
- language comprehensibility: 3.8;
- language style: 3.6;
- image sharpness: 3.8;
- image composition: 3.6; and
- attractiveness of captions/graphics: 3.6.

The study concluded that the medium was appropriate for continued testing and that students considered it helpful, understandable, and engaging.

3.6 Field Evaluation

The field evaluation involved 16 students who had not participated in the previous individual or small-group trials. Students accessed the downloaded learning

medium through smartphones and evaluated its suitability for use as a learning resource.

The ratings were generally high. The highest rating was 4.0 for ease of understanding, while several dimensions received 3.8, including alignment with learning objectives, appropriateness to student ability, language, language style, image color, image sharpness, and attractiveness of captions/graphics.

The lowest reported ratings were 3.4 for speech tempo and for the statement concerning music/sound effects not being too loud. Nevertheless, the study concluded that the product was sufficiently feasible for classroom implementation and that no further major revision was required at this stage.

3.7 Overall Evaluation

The overall evaluation indicates a progressive improvement in the product through iterative testing. The most important revisions emerged during the individual trial, particularly concerning language style and audio balance. Subsequent small-group and field evaluations indicated that these areas had improved. (Fu & Weng, 2024).

The final student response score of 89.35% provides evidence of high perceived feasibility and acceptability. However, this result should not be interpreted as evidence that the AI-based medium caused higher learning achievement, because the study did not directly measure learning gains through a controlled or quasi-experimental design.

4. Discussion

4.1 AI as an Instructional Design Resource

The findings indicate that AI can be integrated into the development of multimedia learning resources without eliminating the role of the educator. In this study, AI-supported applications were distributed across different stages of production: textual content generation, visual generation, character creation, and video production. (Ouyang & Jiao, 2021; Crompton & Burke, 2023).

This approach is consistent with recent research suggesting that generative AI in higher education is increasingly being used as a generator, assistant, and reimager of educational content rather than as a complete replacement for instructional processes.

The present study adds a disciplinary dimension to this discussion by demonstrating an application within Buddhist meditation education. Rather than using AI primarily for writing assistance or student assessment, the study employed AI to construct a multimodal instructional artifact.

4.2 Multimedia and Accessibility

One of the principal strengths of the developed product is its accessibility across different devices. The final MP4 format allowed students to access the resource through computers, laptops, and smartphones. This feature supports flexible and self-directed learning.

The student responses also suggest that accessibility was accompanied by perceived clarity. In the field trial, ease of understanding received the maximum mean score of 4.0. The language used in the medium and its alignment with students'

abilities also received relatively high ratings. (Chan & Hu, 2023).

These findings are consistent with broader educational research emphasizing that technology can enhance access and flexibility when it is embedded within appropriate instructional design. However, accessibility should not be equated automatically with learning effectiveness. A medium may be easy to access and attractive while still requiring further evidence concerning conceptual understanding and transfer. (Ouyang & Jiao, 2021; Wang et al., 2024).

4.3 Iterative Evaluation as a Critical Component

An important contribution of the study is the iterative development process. The first student trial revealed weaknesses in language style and audio balance. These weaknesses were subsequently addressed before the small-group and field evaluations.

This finding reinforces the importance of treating AI-generated outputs as materials requiring human review. Generative AI can accelerate content creation, but it does not guarantee that the resulting instructional communication will automatically match learners' expectations. (Fu & Weng, 2024; Yusuf et al., 2024).

The role of human educators therefore remains central. UNESCO's guidance similarly emphasizes a human-centred approach in which AI is subjected to pedagogical, ethical, and contextual validation.

4.4 Implications for Buddhist Higher Education

The study provides an initial example of how emerging technologies can be incorporated into Buddhist higher education without reducing the role of traditional instructional practices.

Meditation education involves both conceptual and experiential dimensions. The developed medium primarily addresses the instructional and explanatory dimension by presenting introductory material in multimedia form. It should therefore be understood as a complement to guided meditation practice and teacher-student interaction rather than as a substitute for them.

This distinction is particularly important because the current product is fundamentally a multimedia learning resource. Its feasibility does not establish that students can acquire the full experiential competencies associated with meditation solely through AI-generated video.

4.5 Ethical and Pedagogical Considerations

The use of generative AI also introduces several issues requiring attention. AI-generated educational content needs verification for factual accuracy, cultural appropriateness, linguistic clarity, and consistency with the underlying religious tradition. (Fu & Weng, 2024; Yusuf et al., 2024).

UNESCO's guidance identifies privacy, equity, ethical validation, and human-centred pedagogical design as important considerations in the educational use of generative AI.

For Buddhist education, additional considerations may include doctrinal accuracy, contextual sensitivity, appropriate representation of Buddhist symbols and practices, and the distinction between educational explanation and authentic contemplative instruction.

The present study did not systematically investigate these ethical dimensions. This limitation should be explicitly acknowledged when interpreting the findings.

4.6 Contribution and Research Gap

The international literature on generative AI in higher education is growing rapidly, but the distribution of research across academic disciplines remains uneven. Recent systematic reviews indicate that humanities, social sciences, and interdisciplinary fields receive less empirical attention than several technology-oriented and professional disciplines. (Yusuf et al., 2024; Baig & Yadegaridehkordi, 2024).

Against this background, the present study contributes a case from Buddhist higher education in Indonesia. Its contribution is primarily developmental and contextual: it demonstrates a practical workflow for integrating AI-supported text, image, character, and video generation into an instructional product for Buddhist meditation education.

The study also highlights a methodological gap. Much of the emerging literature discusses the opportunities and risks of generative AI at a general level, whereas this study documents the concrete stages through which AI-supported tools can

be transformed into a classroom-ready instructional artifact.

5. Limitations

Several limitations should be considered.

First, the study was conducted within a single higher-education institution and focused on a specific Buddhist meditation course. Therefore, the findings should not be generalized automatically to other institutions, disciplines, or student populations.

Second, the evaluation relied primarily on student perceptions of feasibility, usability, and quality. Although the study report uses the term “effectiveness,” the research design did not include a control group, randomized assignment, or pretest-posttest comparison of learning achievement.

Third, the participant numbers were relatively small and differed across evaluation stages.

Fourth, the study evaluated the product primarily as a multimedia learning resource rather than as a complete meditation-training intervention. Consequently, the findings provide evidence of media feasibility rather than evidence concerning long-term development of meditation competencies.

Finally, because generative AI systems change rapidly, the specific tools used in the 2024 development process may differ substantially from currently available versions. Future research should therefore focus more strongly on pedagogical principles and workflows than on

dependence on particular commercial platforms. (Wang et al., 2024; Baig & Yadegaridehkordi, 2024).

6. Conclusion

This study developed an AI-assisted multimedia learning medium for introductory Buddhist meditation within a higher-education *Samadhi* course. Using the ADDIE framework, the development process proceeded through needs analysis, design, development, implementation, and evaluation.

The resulting product integrated AI-supported text generation, visual generation, character-based video production, and conventional video editing. Iterative testing demonstrated that the product improved through successive revisions, particularly in response to student feedback concerning language style and audio balance.

The overall student response reached 89.35%, which according to the classification used in the original study corresponds to the “very good” and “very feasible” category. The findings therefore support the feasibility and perceived usability of AI-assisted multimedia as a supplementary learning resource for Buddhist meditation education.

Nevertheless, the findings should not be interpreted as evidence of causal effects on academic achievement or meditation competency. The principal contribution of the study is its demonstration of an AI-assisted instructional development process and its empirical evidence concerning perceived feasibility.

Future research should investigate whether AI-assisted multimedia learning produces measurable improvements in students' conceptual understanding, learning motivation, retention, and practical meditation competence. Larger samples, multi-institutional studies, longitudinal designs, and quasi-experimental comparisons would strengthen the evidence base for AI-supported Buddhist education.

Practical implication: AI should be positioned as an instructional design resource under educator supervision rather than as a substitute for teachers, human interaction, or experiential meditation practice.

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