

Development and Validation of a Local Wisdom-based E-module for Folklore Learning Through Discovery Learning

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Abstract

The integration of local cultural heritage into digital learning environments remains a significant challenge in contemporary language education, particularly in fostering cultural literacy among digitally oriented learners. This study aimed to develop and validate a local wisdom-based flipbook e-module for folklore learning using a Discovery Learning approach. The study employed a research and development design based on the Dick and Carey instructional design model. The developed e-module was evaluated through expert validation involving media, content, and language experts, followed by a limited field trial with 24 tenth-grade students. Data were collected using validation sheets and student response questionnaires and analyzed descriptively using percentage scores, validity testing, and reliability analysis with IBM SPSS Statistics Version 29. The results revealed a high level of theoretical validity, with average scores of 82% for media aspects, 87% for content aspects, and 87% for language aspects, yielding an overall validity score of 85.17%, which indicates a very valid product. Student responses demonstrated high practicality, with positive response rates ranging from 70.8% to 100%, particularly in material comprehension (100%) and clarity of instructions (95.8%). Reliability testing showed good internal consistency (Cronbach's $\alpha = 0.884$). These findings indicate that the integration of Discovery Learning principles, interactive multimedia features, and Banten local wisdom produces a theoretically valid and practically well-received learning resource; because the trial was limited to a small sample within a single provincial context, the results should be interpreted as evidence of feasibility and practicality rather than of instructional effectiveness. The developed e-module nonetheless offers a promising approach to enhancing student engagement, cultural literacy, and appreciation of local heritage within digital learning environments.

Keywords: Digital Learning, Discovery Learning, Flipbook E-module, Folklore Education, Local Wisdom.

Introduction

Literature education plays a critical role in cultivating students' literary competence, critical literacy, and cultural awareness while simultaneously serving as a medium for character formation and the preservation of cultural heritage. Within this context, folktales constitute an important pedagogical resource because they embody local knowledge, moral values, and collective cultural memory that can strengthen students' understanding of their sociocultural identity. Despite this potential, the implementation of folktale instruction in senior high schools remains constrained by conventional pedagogical practices. Learning activities continue to rely heavily on printed textbooks and teacher-centered approaches, which offer limited opportunities for interaction, exploration, and critical engagement with literary texts (1, 2). Consequently, students often perceive literature learning as passive and

disconnected from their everyday experiences. The challenge has become increasingly pronounced in the digital era, where the learning preferences of Generation Z and Generation Alpha are shaped by technology-rich environments. Contemporary learners expect instructional experiences that are interactive, multimodal, and accessible through digital platforms. However, many learning resources for literature have yet to adapt to these expectations, resulting in a mismatch between students' learning characteristics and existing instructional practices. Without meaningful pedagogical innovation, local folktales risk losing their relevance among younger generations and becoming detached from the sociocultural contexts they were originally intended to preserve (3). This situation highlights the urgent need for learning environments that simultaneously promote digital engagement and

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cultural sustainability. One promising response to this challenge is the development of interactive digital teaching materials. Among various forms of digital media, flipbook-based e-modules offer significant pedagogical advantages by integrating text, images, audio, video, and interactive navigation into a single learning platform. Such multimodal features can support multisensory learning, increase learner engagement, and facilitate deeper comprehension of literary content. More importantly, digital teaching materials provide opportunities to transform students from passive recipients of information into active participants in the learning process. Nevertheless, the effectiveness of digital media depends not only on technological sophistication but also on the pedagogical framework that guides its implementation.

In this regard, discovery learning provides a theoretically robust foundation for promoting active knowledge construction. Rooted in constructivist learning theory, discovery learning encourages students to investigate problems, identify patterns, formulate interpretations, and construct understanding through independent inquiry. Within literature education, this approach enables learners to explore narrative structures, interpret cultural meanings, and critically evaluate values embedded in literary texts. Previous studies have demonstrated that discovery learning enhances critical thinking, problem-solving skills, and metacognitive awareness, all of which are essential competencies for meaningful literary analysis (4-6). Therefore, integrating discovery learning into a digital learning environment may increase the educational value of interactive media by ensuring that technological features support higher-order cognitive processes rather than merely providing visual attraction.

Empirical evidence further supports the potential of digital instructional materials in improving learning outcomes. Studies consistently report that e-modules promote learner autonomy and contribute positively to academic achievement compared with conventional teaching materials (7, 8). Specifically, flipbook-based learning resources have been found to enhance visual engagement, reading motivation, and information retention through interactive multimedia presentation (9-11). Concurrently, recent research emphasizes the importance of integrating local wisdom into

language and literature education. Embedding local cultural values within learning materials has been identified as a strategic approach to strengthening cultural identity, character development, and appreciation of regional heritage among younger generations (12, 13). In folklore instruction, local wisdom not only enriches literary understanding but also enhances contextual relevance by connecting learning content with students' sociocultural realities.

Although previous studies have demonstrated the effectiveness of digital learning media, discovery learning, and the integration of local wisdom, these strands of research have largely evolved independently. Existing studies tend to focus either on the technological development of e-modules, the pedagogical benefits of discovery learning, or the cultural significance of local wisdom-based materials. Consequently, limited attention has been given to the comprehensive integration of these three dimensions within a single instructional framework. Moreover, many existing digital learning resources remain oriented toward generic content and insufficiently address learners' cultural and emotional contexts. This gap suggests the need for instructional innovations that combine interactive digital media, inquiry-based learning processes, and culturally relevant literary content.

To address this gap, the present study develops a flipbook-based e-module for folktale instruction grounded in Banten local wisdom and structured according to discovery learning principles. The novelty of this study lies in the systematic integration of digital interactivity, inquiry-oriented pedagogy, and local cultural content within a unified learning resource. Accordingly, this study aims to design, validate, and evaluate the feasibility of the developed e-module for senior high school students. Feasibility is assessed through expert validation and students' responses in a limited field trial, providing empirical evidence regarding the potential of culturally responsive digital learning materials to enhance literature education in contemporary secondary schools. Specifically, this study addresses the following research objectives:

- (a) to describe the development process of the Banten local wisdom-based flipbook e-module using the Dick and Carey instructional design model;

- (b) to examine the theoretical validity of the e-module based on media, content, and language expert assessment;
- (c) to evaluate the practicality of the e-module based on student responses obtained in a limited field trial; and
- (d) to determine the reliability of the instrument used to measure those student responses.

Methodology

This study employed a Research and Development approach using the Dick and Carey instructional design model as the development framework (14). The model was selected because it provides a systematic and iterative process for designing, developing, and evaluating instructional products. The development of the flipbook-based e-module for Banten folktale instruction integrated with discovery learning principles was conducted through ten stages:

- (a) identifying instructional goals,
- (b) conducting instructional analysis,
- (c) analyzing learners and learning contexts,
- (d) formulating performance objectives,
- (e) developing assessment instruments,
- (f) designing instructional strategies,
- (g) developing and selecting instructional materials,
- (h) conducting formative evaluation,
- (i) revising the instructional product, and
- (j) performing summative evaluation. These stages ensured that the developed e-module aligned

with instructional objectives, learner characteristics, and curriculum requirements. Formative evaluation consisted of expert validation and a limited field trial involving students. Expert validation was conducted to assess the e-module's content accuracy, instructional design, language appropriateness, and media quality. The validation panel comprised six experts in total, consisting of two media experts, two content experts, and two language experts, whose institutional affiliations are presented in the following Table. Validators were purposively selected based on their relevant academic qualifications and professional expertise (instructional media design, Indonesian language and literature content, or regional language standardization) and their institutional affiliation with a university education faculty or a provincial language office; each validator holds a graduate-level qualification in a field directly relevant to the aspect evaluated. Subsequently, a limited trial was conducted to gather students' responses on the usability, attractiveness, and practicality of the developed product. Feedback obtained from both experts and students was used to revise and refine the e-module, resulting in a valid and feasible instructional resource for senior high school literature education. Figure 1 presents the instructional design model applied in this study (14).

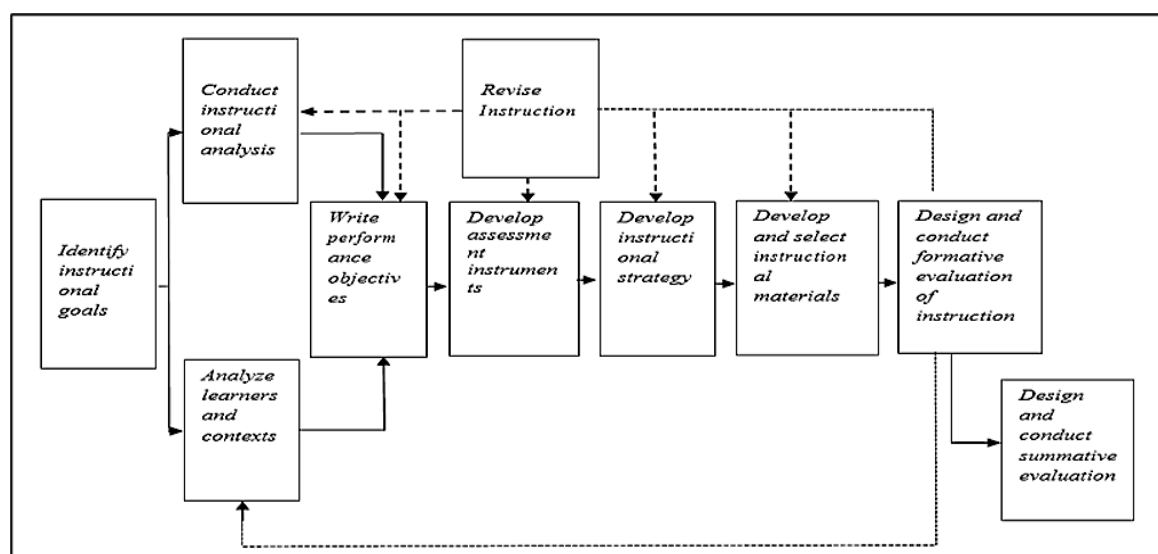


Figure 1: Instructional Design Model Applied in This Study (14)

The study aimed to develop a flipbook-based e-module that incorporates Banten local wisdom to

teach folktale texts in senior high schools, applying discovery learning principles. The primary

objective was to produce an instructional resource that met established standards of validity, practicality, and feasibility, as determined through expert validation and student responses during the limited field-testing stage.

The limited field trial was conducted in selected senior high schools located in Tangerang Regency, Pandeglang Regency, and Lebak Regency, Banten Province. A total of 24 tenth-grade students participated as trial subjects. The trial was designed to evaluate the practicality and preliminary usability of the developed e-module prior to any larger-scale, effectiveness-focused implementation.

Data were collected through interviews, questionnaires, and document analysis. The data sources comprised subject-matter experts, media experts, language experts, Indonesian language teachers, and students participating in the field

trial. Expert validation instruments were used to assess the quality of the e-module's content, media design, and language, whereas student response questionnaires were administered to evaluate the product's usability, attractiveness, and learning support.

The collected data were analyzed using descriptive quantitative techniques. All evaluation instruments employed a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Mean scores obtained from expert validation and student response questionnaires were converted into percentage scores and subsequently categorized according to predetermined feasibility criteria. The resulting scores were used to determine the validity, practicality, and overall feasibility of the developed e-module. The classification criteria applied in the analysis are presented in Tables 1 and 2 (15).

Table 1: Expert Validation Criteria Based on Percentage Scores

Percentage Score (%)	Validity Level	Decision
0.0–20.0	Very Low Validity	Major Revision Required
20.1–40.0	Low Validity	Revision Required
40.1–60.0	Moderate Validity	Revision Required
60.1–80.0	High Validity	Minor Revision Required
80.1–100.0	Very High Validity	No Revision Required

Table 2: Student Response Classification Criteria

Grade	Mean Score Range	Percentage Range (%)	Interpretation
A	4.21–5.00	84–100	Very Positive
B	3.41–4.20	68–83	Positive
C	2.61–3.40	52–67	Moderately Positive
D	1.81–2.60	36–51	Less Positive
E	0.00–1.80	0–35	Very Negative

The criteria presented in Tables 1 and 2 were used to assess the theoretical feasibility and practical acceptability of the developed e-module. Mean scores obtained from expert validation and student response questionnaires were converted into percentage values and subsequently classified according to the predetermined interpretation criteria. The resulting categories provided the basis for evaluating the validity, practicality, and overall feasibility of the flipbook-based folktale e-module integrated with discovery learning principles. Products achieving high or very high feasibility classifications were considered suitable for subsequent large-scale implementation and evaluation.

Results

The local wisdom-based flipbook e-module on Banten folktales underwent formative evaluation using the Dick and Carey instructional design framework. The evaluation examined the module's validity, feasibility, and practicality through expert appraisal and limited-scale implementation with students to obtain empirical evidence of its instructional quality and usability.

E-Module Design Stages Based on the Dick and Carey Model

(a) Identifying Instructional Goals

The design process began with the identification of instructional goals for learning folklore texts at Phase E (Grade X). Drawing on the learning

outcomes specified in the Merdeka Curriculum, the instructional goal was formulated to enable students to comprehend, analyze, produce, and present Banten local folklore texts. In addition, students were expected to identify and reflect on the moral values and local wisdom embedded in the narratives by integrating listening, reading, viewing, writing, and oral presentation skills.

(b) Conducting Instructional Analysis

Following the identification of instructional goals, an instructional analysis was conducted to determine the prerequisite knowledge, skills, and sub-competencies required for students to achieve the intended learning outcomes. Based on this analysis, the e-module was organized into three sequential learning units:

- I. **Learning Unit 1:** Exploring the World of Folklore—students examined the structural components of folklore texts, including orientation, complication, evaluation, resolution, and coda, to develop a comprehensive understanding of narrative organization.
- II. **Learning Unit 2:** Analyzing Intrinsic Elements and Local Wisdom Values—students investigated the intrinsic elements of folklore and identified local wisdom values embedded in the narratives using audiovisual learning materials.
- III. **Learning Unit 3:** Cultural Verification and Reflection—students engaged in critical reflection by reconstructing or adapting the moral and cultural values presented in folklore narratives to contemporary social contexts, thereby strengthening their cultural awareness and interpretative skills.

(c) Analyzing Learners and Contexts

This stage focused on examining the characteristics of the target learners and the contextual factors surrounding the learning environment. The target users were Phase E students aged 15–16 years from senior high schools located in Tangerang, Pandeglang, and Lebak Regencies. The analysis revealed the following findings:

- I. **Learner Characteristics:** students predominantly belong to Generation Z and exhibit strong familiarity with digital technologies. Their learning preferences tend to favor visual and multimedia-based content, while their engagement is often influenced by relatively short attention spans and a preference for

immediate feedback and outcomes. These characteristics highlight the need for interactive and visually engaging instructional materials.

- II. **Contextual Characteristics:** Banten folklore faces challenges related to limited digital documentation and dissemination, resulting in declining exposure among younger generations. Consequently, students are often more familiar with global popular culture than with local cultural narratives. In addition, disparities in digital access between peri-urban and rural areas of Banten Province necessitate the development of learning resources that remain accessible across diverse technological contexts.

(d) Writing Performance Objectives

At this stage, the identified sub-competencies were translated into specific, observable, and measurable performance objectives to guide instructional activities and assessment. The objectives were formulated using action verbs that clearly describe the expected learner performance. Examples of the performance objectives include:

- I. students can independently identify at least three intrinsic elements of a Banten folklore narrative presented through video-based learning materials; and
- II. students can analyze the relevance of the moral values conveyed in Banten folklore to contemporary social issues and contexts.

(e) Developing Assessment Instruments

To evaluate the attainment of the performance objectives, a set of authentic assessment instruments was developed and integrated into the e-module. These instruments were designed to assess students' prior knowledge, learning processes, and learning outcomes. The assessment components included:

- I. **Diagnostic Test (Pretest):** A 20-item multiple-choice test was administered to assess students' prior knowledge and baseline understanding of folklore texts before engaging with the e-module.
- II. **Student Worksheets:** interactive worksheets were designed in accordance with the Discovery Learning framework, incorporating activities such as comparing moral values, analyzing contemporary social issues, and drawing connections between folklore narratives and real-life contexts.

- III. **Formative Test (Posttest):** a post-instruction assessment was administered at the end of the learning process to measure students' achievement of the intended learning outcomes and to evaluate the instructional adequacy of the e-module.

(f) Developing Instructional Strategies

The instructional strategy was developed by integrating the phases of the Discovery Learning model into the e-module's digital storyboard. To enhance learner engagement and promote active knowledge construction, the learning sequence was designed as an interactive multimedia experience. The instructional strategy comprised the following stages:

- I. **Stimulation:** students were introduced to Banten folklore through animated video content designed to activate prior knowledge and stimulate curiosity about the learning topic.
- II. **Problem Statement:** critical guiding questions were presented to encourage students to identify and formulate problems related to the plot, characters, and underlying messages of the folklore narratives.
- III. **Data Collection and Processing:** students explored interactive folklore texts and audio recordings embedded within the e-module to gather, organize, and interpret relevant information.
- IV. **Verification and Generalization:** students participated in collaborative group discussions and completed interactive worksheets to verify their understanding of the folklore narratives. These activities facilitated independent reflection and enabled students to formulate and generalize the moral values embedded within the stories.

(g) Develop and Select Instructional Materials

This stage involved the translation of the initial prototype blueprint into a functional digital learning resource through a systematic production and development process:

- I. **Initial Production in Canva:** the initial prototype was developed using Canva, incorporating a culturally themed visual design, high-readability typography, Banten folklore character illustrations, navigation icons, and systematically organized content. The layout was structured from the cover page to the main menu interface to ensure visual coherence and user-friendly navigation.
- II. **Interactive Transformation Using FlipBuilder (Flip PDF Plus Pro):** the Canva design was converted into an interactive flipbook format with page-turning effects. Multimedia features, including animated YouTube videos, audio storytelling clips, external hyperlinks to Wordwall quizzes, interactive navigation buttons, and a digital table of contents, were integrated to enhance accessibility and user engagement across both online and offline learning environments (16). Figure 2 shows the initial design of the e-module before expert validation, while Figure 3 presents the revised design developed in response to expert feedback. Both figures are authentic screenshots of the e-module produced using the software described above; no image-generation artificial intelligence tool was used to produce these visuals (see the Declaration of Artificial Intelligence Assistance).



Figure 2: E-module Design Before Expert Validation and Revision



Figure 3: Revised E-module Following Expert Validation and Revision

Table 3: Summary of Expert Feedback and Suggested Revisions for the E-Module

Validator (Institution)	Expertise	Evaluated Aspect	Summary of Recommendations
FS (Universitas Negeri Semarang)	Media Expert	Cover Design, Layout, Typography, Multimedia Features, Content Structure	Improve the cover by incorporating Banten cultural symbols and refining the title. Enhance page layout, visual illustrations, text readability, and navigation features. Provide source citations for embedded multimedia, add interactive elements, and strengthen the integration of language skills through a more systematic learning structure.
NY (Universitas Bengkulu)	Media Expert	Visual Readability, Navigation System, Audio Quality	Increase the resolution and readability of concept maps, correct hyperlink navigation errors, and improve audio quality through the use of human voice recordings rather than solely AI-generated narration.
GZ (Universitas Muhammadiyah Tangerang)	Content Expert	Content Coverage, Visual Presentation	Expand the representation of Banten folklore by including stories from additional districts and municipalities. Improve the attractiveness of the cover design, simplify introductory pages, and incorporate more visual illustrations throughout the learning materials.
BS (Universitas Al-Azhar Indonesia)	Content Expert	Learning Design and Discovery Learning Integration	Strengthen the integration among language-skill activities, enhance opportunities for critical thinking, ensure consistent implementation of Discovery Learning syntax, increase collaborative learning activities, and improve visual interactivity and instructional clarity.
NS (Kantor Bahasa Provinsi Banten)	Language Expert	Language Usage and Writing Style	Increase the use of standard Indonesian terminology, revise folklore narratives using a more appropriate written style, and maintain consistency in learner address forms throughout the module.
MT (Universitas Tanjungpura Pontianak)	Language Expert	Paragraph Structure, Sentence Effectiveness, Typography, Linguistic Accuracy	Improve paragraph organization, eliminate redundant expressions, correct typographical and capitalization errors, and revise sentence constructions to enhance clarity, coherence, and linguistic accuracy.

Overall, the experts evaluated the Banten local wisdom-based flipbook e-module as possessing a well-structured instructional design and demon-

strating substantial conceptual innovation. Despite several recommendations for improvement as given in Table 3, all validators concluded that the

product was suitable for use with revisions. The incorporation of expert feedback into the revision process enhanced the pedagogical, technical, and linguistic quality of the e-module, resulting in a valid, interactive, and user-friendly digital learning resource suitable for implementation in authentic classroom settings.

The Banten local wisdom-based flipbook e-module was subjected to expert validation prior to field

implementation. The validation process involved two media experts, two content experts, and two language experts who assessed the product from pedagogical, technical, and linguistic perspectives. The evaluation aimed to ensure the validity, usability, and instructional effectiveness of the e-module. The aggregated validation results are presented in Table 4.

Table 4: Expert Validation Results

	Average Likert Score	Average Percentage
Media Expert		
FS	3.5	70
NY	4.7	94
Average	4.1	82
Content Expert		
GZ	4.1	82
BS	4.6	92
Average	4.4	87
Language Expert		
MT	5.0	100
NS	3.7	73
Average	4.3	87

As shown in Table 4, the media experts evaluated the e-module positively, yielding mean Likert scores of 3.5 and 4.7, equivalent to 70% and 94%, respectively. The overall validation score reached 4.1 (82%), which falls within the “Good” category and corresponds to a “Highly Valid” level of feasibility. These findings indicate that the e-module demonstrated satisfactory quality in terms of visual design, interface layout, navigation features, multimedia integration, and overall usability. Although several recommendations for improvement were provided, particularly regarding visual presentation and interactive features, the product was considered appropriate for educational use following minor revisions.

The results of the content expert validation show mean Likert scores of 4.1 and 4.6, corresponding to feasibility percentages of 82% and 92%, respectively. The combined score of 4.4 (87%) was categorized as “Very Good” and met the criteria for “Highly Valid.” This result suggests that the e-module demonstrates strong content quality in relevance, accuracy, completeness, instructional organization, and alignment with the Discovery Learning approach. The experts acknowledged the adequacy of the learning materials while recommending further enrichment of local folklore

content and stronger integration of collaborative and higher-order thinking activities.

The language validation results presented in Table 4 indicate that the e-module achieved mean Likert scores of 5.0 and 3.7, equivalent to 100% and 73%, respectively. The overall score of 4.3 (87%) was classified as “Very Good” and fulfilled the criteria for “Highly Valid.” These findings demonstrate that the language used in the e-module was generally clear, appropriate, and suitable for the target learners. The validators particularly emphasized the need for improvements in the use of standard Indonesian terminology, consistency of learner address forms, paragraph organization, and typographical accuracy. Nevertheless, the linguistic quality of the e-module was considered sufficiently strong to support effective learning.

Based on the results presented in Table 4, the validation outcomes across the three expert domains demonstrated a high level of feasibility. The media aspect achieved a mean score of 82.0%, while the content and language aspects obtained mean scores of 87.0% and 86.5%, respectively. The overall average theoretical validation score reached 85.17%. According to the established feasibility criteria, this score falls within the 81%–100% range, indicating that the Banten folklore

flipbook e-module is classified as highly feasible and demonstrates a strong level of validity. Therefore, the e-module was deemed suitable for implementation following minor revisions informed by the qualitative feedback from the expert validators.

Limited Trial and Student Response Results

Following the revision process informed by expert feedback, the e-module underwent a limited field trial with 24 senior high school students. This stage

aimed to evaluate students' perceptions of the e-module and its practicality in supporting classroom learning; as a small-sample formative trial, it was not designed to measure learning effectiveness or generalize to other populations. Data were collected using a Google Forms questionnaire employing a five-point Likert scale. The questionnaire assessed students' responses to the e-module regarding usability, content presentation, visual appeal, interactivity, and overall learning experience. The results of the limited trial are presented in Table 5.

Table 5: Student Responses to the Banten Local Wisdom-Based Flipbook E-Module During the Limited Trial

Aspect	Indicator	Strongly Agree [5]	Agree [4]	Positive Response	Interpretation
Design and Visual Quality	Visual appearance is attractive and consistent with the Banten folklore theme	50.0%	41.7%	91.7%	Highly Feasible
Design and Visual Quality	Text display is clear and easy to read	50.0%	33.3%	83.3%	Highly Feasible
Design and Visual Quality	User instructions are clear and easy to follow	62.5%	33.3%	95.8%	Highly Feasible
Design and Visual Quality	The flipbook format is more engaging than printed materials	33.3%	45.8%	79.1%	Feasible
Content Presentation and Language	Folklore materials are easy to understand	41.7%	58.3%	100%	Highly Feasible
Content Presentation and Language	The content is organized systematically and is easy to follow	37.5%	54.2%	91.7%	Highly Feasible
Content Presentation and Language	The language used is simple and comprehensible	50.0%	45.8%	95.8%	Highly Feasible
Multimedia Interactivity and Local Relevance	Visuals, audio, and videos facilitate understanding of the stories	50.0%	45.8%	95.8%	Highly Feasible
Multimedia Interactivity and Local Relevance	The content is relevant to students' experiences and local context	37.5%	50.0%	87.5%	Highly Feasible
Psychological Impact and Learning Motivation	The e-module helps students understand local cultural values	41.7%	50.0%	91.7%	Highly Feasible
Psychological Impact and Learning Motivation	The e-module increases learning self-confidence	33.3%	41.7%	75.0%	Feasible
Psychological Impact and Learning Motivation	Learning activities become more enjoyable	45.8%	25.0%	70.8%	Feasible
Psychological Impact and Learning Motivation	The e-module enhances learning enthusiasm and engagement	45.8%	45.8%	91.6%	Highly Feasible

Note: % = Percentage.

As presented in Table 5, students demonstrated highly positive perceptions of the flipbook-based

e-module. Within the design and visual quality dimension, the indicator for the clarity of usage

instructions achieved the highest positive response rate (95.8%), indicating that students experienced little difficulty navigating and using the learning resource. In the content presentation and language dimension, the indicator assessing the ease of understanding folklore materials received a perfect positive response rate (100%). These findings suggest that integrating Banten local wisdom into an interactive digital flipbook

format effectively supported students' comprehension and facilitated meaningful engagement with the learning content in this trial. Furthermore, the consistently high response rates across most indicators reflect the practicality and usability of the e-module in supporting classroom learning, although confirmation of its pedagogical impact on learning outcomes requires a larger, effectiveness-oriented study.

Table 6: Item-total Statistics of the Student Response Questionnaire (IBM SPSS Statistics Version 29)

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
P1	56.0833	32.080	0.736	0.868
P2	55.9583	35.955	0.243	0.889
P3	56.2083	33.216	0.479	0.880
P4	56.1250	34.288	0.586	0.876
P5	56.0833	33.732	0.574	0.876
P6	56.1250	35.505	0.309	0.886
P7	56.2917	32.998	0.585	0.875
P8	56.2083	35.042	0.338	0.886
P9	56.5000	30.696	0.690	0.869
P10	56.3750	29.288	0.847	0.860
P11	56.4583	32.868	0.467	0.882
P12	56.2917	31.520	0.717	0.868
P13	56.1667	33.101	0.537	0.877
P14	56.1667	32.493	0.690	0.870

Table 6 presents the item-total statistics of the student response questionnaire, and Table 7 summarizes the corresponding validity decisions. Based on the comparison between the calculated correlation coefficient (r calculated) and the critical value (r table = 0.404), 11 out of 14 items were found to be valid, while three items (P2, P6, and P8) did not meet the validity criterion because their correlation coefficients were lower than the

required threshold. Item P10 demonstrated the highest validity coefficient ($r = 0.847$), indicating a strong contribution to the overall construct. Overall, the findings suggest that the majority of questionnaire items accurately measured students' responses to the developed e-module and could therefore be used in subsequent analyses.

Table 7: Validity Test Results of the Student Response Questionnaire (IBM SPSS Statistics Version 29)

Item	r calculated	r table	Interpretation
P1	0.736	0.404	Valid
P2	0.243	0.404	Invalid
P3	0.479	0.404	Valid
P4	0.586	0.404	Valid
P5	0.574	0.404	Valid
P6	0.309	0.404	Invalid
P7	0.585	0.404	Valid
P8	0.338	0.404	Invalid
P9	0.690	0.404	Valid
P10	0.847	0.404	Valid
P11	0.467	0.404	Valid

P12	0.717	0.404	Valid
P13	0.537	0.404	Valid
P14	0.690	0.404	Valid

Based on the validity analysis using the Corrected Item-Total Correlation method with 24 respondents, the critical value of *r* table at the 5% significance level was 0.404. The results indicated that 11 of the 14 questionnaire items achieved correlation coefficients exceeding the critical threshold and were therefore classified as valid. These items included P1, P3, P4, P5, P7, P9, P10,

P11, P12, P13, and P14. In contrast, three items (P2, P6, and P8) yielded correlation coefficients below the required threshold and were therefore categorized as invalid. Overall, the findings demonstrate that the instrument had adequate construct validity, with 11 valid items retained for subsequent data collection and analysis.

Table 8: Reliability Test Decision Criteria Based on Cronbach's Alpha

Cronbach's Alpha (α)	Interpretation
≥ 0.90	Excellent reliability
0.80–0.89	Good reliability
0.70–0.79	Acceptable reliability
0.60–0.69	Marginal reliability
< 0.60	Inadequate reliability

Table 9: Reliability Test Results

Cronbach's Alpha (α)	Number of Items	Interpretation
0.884	14	Good Reliability

Based on the decision criteria presented in Table 8, the instrument demonstrated satisfactory reliability, as the Cronbach's alpha coefficient ($\alpha = 0.884$) exceeded the minimum acceptable threshold of 0.60. Table 9 summarizes the reliability test results.

Instrument reliability was assessed using Cronbach's alpha coefficient in IBM Statistical Package for the Social Sciences (SPSS) Statistics Version 29.

The analysis yielded a Cronbach's alpha value of 0.884 across 14 items, indicating good internal consistency. As the obtained coefficient exceeded the minimum acceptable threshold of 0.60, the instrument was deemed reliable. Therefore, the instrument demonstrated sufficient reliability and was considered suitable for data collection in the present study.

Discussion

The development of the local wisdom-based flipbook e-module for folklore learning using a discovery learning approach was evaluated through theoretical feasibility (expert validation) and practical feasibility (student responses). The findings demonstrated that the e-module achieved high levels of theoretical validity and student-

reported practicality, indicating its suitability as an instructional resource for Indonesian language learning. These results are broadly consistent with prior research on interactive digital learning materials, discussed in detail below, although several findings also point to context-specific constraints that qualify how far the results can be generalized.

Theoretical Validity of the E-module Based on Expert Evaluation

The formative evaluation conducted through expert review yielded an overall average score of 85.17%, indicating that the developed e-module achieved a very high level of validity and was suitable for implementation. The media aspect obtained a validity score of 82.0%, reflecting the effectiveness of the flipbook technology in integrating multimedia elements such as text, audio, video, and animation within a single web-based learning environment. This finding is consistent with previous studies demonstrating that interactive digital learning materials can promote learner autonomy, engagement, and reading comprehension through multimedia-supported instruction (17, 18); however, the media score obtained here (82.0%) is somewhat lower than the validity scores reported in several

comparable flipbook-development studies (9-11), which more commonly report media validity above 85%. One plausible explanation, consistent with the media validators' own feedback in Table 3, is the initial reliance on AI-generated narration for audio content, which one validator (NY) explicitly asked to be replaced with human voice recordings; this suggests that the quality of the audio component, rather than the flipbook format itself, was the main factor holding back the media score, and it is a specific, addressable target for future refinement rather than a general weakness of flipbook-based media.

The content aspect achieved the highest validity score (87.0%), indicating strong alignment between the instructional content and the learning outcomes specified in the Merdeka Curriculum for Grade X (Phase E). Revisions based on expert recommendations, including the incorporation of folklore narratives representing various regions of Banten Province, enriched the cultural breadth and contextual relevance of the learning materials. From a culturally responsive pedagogical perspective, integrating authentic local narratives into language learning enables students to connect academic content with their sociocultural environment, thereby fostering cultural awareness and strengthening local identity, a pattern also reported in studies of local-wisdom-based instructional materials in other regions of Indonesia (12, 13). Such an approach is particularly important in contemporary educational settings, where local cultural values increasingly compete with the influence of global popular culture.

The language aspect also demonstrated high validity (86.5%), highlighting the clarity, appropriateness, and communicative effectiveness of the instructional language used throughout the e-module. Revisions informed by linguistic experts, including the restructuring of introductory sections, elimination of redundant expressions, maintenance of consistent forms of address, and correction of typographical errors, substantially improved the quality of instructional communication. The use of clear, age-appropriate language ensured that students could accurately understand learning objectives, explanations, and task instructions, thereby minimizing ambiguity and supporting effective knowledge acquisition. Collectively, these findings confirm that the

developed e-module meets the theoretical validity requirements across the media, content, and language dimensions, providing a strong foundation for its practical implementation in folklore learning.

Practicality of the Discovery-Learning-Based E-module

The limited field trial involving 24 tenth-grade students revealed a high level of practicality and self-reported satisfaction with the developed e-module. The material comprehension indicator achieved a 100% positive response rate, followed by the clarity of usage instructions (95.8%) and the suitability of the Banten folklore-themed visual design (91.7%). These findings indicate that the e-module was well received by the participating students and successfully facilitated access to learning materials through an engaging and user-friendly digital environment. Furthermore, reliability testing conducted in IBM SPSS Statistics Version 29 yielded a Cronbach's alpha of 0.884, indicating good internal consistency and demonstrating that the response instrument was reliable for measuring students' perceptions of the e-module in this trial.

The comparatively positive responses may be associated with the integration of Discovery Learning principles throughout the learning process. The e-module was systematically structured around the stages of stimulation, problem identification, data collection, verification, and generalization, designed to enable students to construct knowledge actively rather than receive it passively. In this context, multimedia elements such as animations, visual illustrations, and interactive activities functioned as pedagogical tools intended to support inquiry, critical reflection, and independent learning. This interpretation is consistent with previous studies indicating that discovery-based learning is associated with stronger critical thinking, metacognitive awareness, and motivation than traditional teacher-centered approaches (19, 20); however, because the present study did not include a pretest-posttest or comparison-group design, this association with Discovery Learning principles should be read as a plausible explanation supported by the students' self-reported responses rather than as a demonstrated causal effect on learning outcomes.

The two indicators with the comparatively lowest positive response rates, “Learning activities become more enjoyable” (70.8%) and “The e-module increases learning self-confidence” (75.0%), both fall within the psychological impact and learning motivation dimension. This pattern suggests that, while the e-module was consistently well received in terms of usability, content clarity, and cultural relevance, its motivational impact was somewhat more variable across respondents, an aspect that warrants closer attention, for example, through qualitative follow-up, in subsequent studies.

Beyond its instructional value, the trial data suggest a positive relationship between the e-module and students’ self-reported interest in local cultural heritage. Respondents expressed a strong interest in learning folklore through digital media, which is consistent with the broader argument that integrating local wisdom into technology-based learning environments can increase the perceived relevance of cultural content among students who might otherwise view local folklore as less engaging than contemporary media (21-25). Consequently, within the scope of this limited trial, the e-module appears promising not only as a digital learning resource but also as a means of promoting cultural literacy and appreciation for local heritage in an increasingly digitalized educational landscape.

Conclusion

This study developed and validated a local-wisdom-based flipbook e-module for folklore learning, grounded in the principles of Discovery Learning. The findings demonstrated that the e-module achieved a high level of theoretical validity across media (82%), content (87%), and language (87%) dimensions, resulting in an overall validity score of 85.17%. The limited field trial with 24 tenth-grade students further indicated favorable practicality, as reflected by generally positive student responses regarding content comprehension, usability, visual design, and learning engagement, and the response instrument itself demonstrated good internal consistency (Cronbach’s $\alpha = 0.884$).

Within the scope of a formative, small-sample field trial, these results suggest that integrating local wisdom into interactive digital learning materials can produce a resource that is both theoretically

valid and widely received in practice. The incorporation of Discovery Learning stages was designed to encourage active knowledge construction, critical reflection, and student-centered learning, while the flipbook format was intended to enhance accessibility and engagement through multimedia-rich learning experiences. Beyond its instructional design, the developed e-module illustrates one concrete way in which culturally responsive digital pedagogy can be operationalized for Banten folklore; confirming its effectiveness for language learning outcomes and its generalizability beyond this sample and context remains a task for future summative research, as discussed below.

Limitations

Several limitations should be considered when interpreting the findings of this study. First, the limited field trial involved only 24 tenth-grade students from schools in the Tangerang, Pandeglang, and Lebak Regencies of Banten Province. Consistent with the Dick and Carey formative-evaluation framework, a sample of this size is appropriate for an initial practicality and usability assessment within a research-and-development study, but it is not sufficient to establish the e-module’s effectiveness on learning outcomes or to generalize the findings to other student populations, curricula, or regions. Second, the study relied on a one-shot descriptive design using validation sheets and a post-use response questionnaire; it did not include a pretest-posttest, control-group, or longitudinal component, so claims about the e-module’s pedagogical impact on comprehension, critical thinking, or cultural appreciation should be read as associations suggested by self-reported data rather than as demonstrated causal effects. Third, three items from the 14-item student response questionnaire (P2, P6, and P8) did not meet the corrected item-total correlation threshold, suggesting that parts of the instrument may require further refinement before reuse in future studies. Finally, expert validation, although conducted by six qualified validators across media, content, and language domains, remains subject to the individual judgment and institutional perspective of the validators involved, and a larger or more geographically diverse validator panel could further strengthen the theoretical validity evidence.

Future Research

Building on the feasibility evidence established here, future research should pursue a larger-scale, summative field trial with a pretest-posttest or quasi-experimental comparison-group design to test the e-module's effect on folklore comprehension, critical thinking, and cultural literacy outcomes rather than on usability alone. Such a study should recruit a larger and more geographically diverse sample of students across multiple schools and, ideally, multiple regions of Indonesia, to support stronger claims of generalizability. Further work should also revise or replace the three underperforming questionnaire items (P2, P6, and P8) identified in the validity analysis, and could usefully incorporate qualitative methods, such as student interviews or classroom observation, to better understand the sources of variability observed in the motivation-related indicators. Finally, replacing the AI-generated narration flagged by the media validators with human voice recordings, as already recommended in Table 3, offers a concrete next step to improve the media validity of the product before any large-scale trial.

Practical Implications

For classroom practice, the findings suggest that Indonesian language teachers in Banten, and potentially in other regions with comparable local-wisdom content, can adopt flipbook-based e-modules structured around Discovery Learning stages as a feasible supplement to printed folklore materials, provided that audio and multimedia components are produced with attention to authenticity (for example, human narration) rather than relying solely on AI-generated voice output. For curriculum developers and instructional designers, the study illustrates a concrete, replicable workflow that combines the Dick and Carey model with expert validation and a limited student trial and can be applied to develop culturally responsive digital materials for other local folklore traditions across Indonesia. For teacher-education institutions, the validator panel composition in this study (media, content, and language experts drawn from universities and a provincial language office) offers a practical template for organizing multi-domain expert review when developing similar instructional products.

Abbreviations

AI: Artificial Intelligence, BSNP: Badan Standar Nasional Pendidikan, EYD: Ejaan Yang Disempurnakan, IBM: International Business Machines Corporation, LKPD: Lembar Kerja Peserta Didik (Student Worksheets), SPSS: Statistical Package for the Social Sciences.

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Author Contributions

Ilmi Solihat: Conceptualization, Methodology, Software, Validation, Formal Analysis, Investigation, Resources, Data Curation, Writing -Original Draft Preparation, Project Administration, Aceng Hasani: Writing - Review and Editing, Conceptualization, Supervision, Odien Rosidin: Writing - Review and Editing, Formal Analysis, Supervision. All authors have read and agreed to the published version of the manuscript.

Conflict of Interest

Ilmi Solihat declares no conflict of interest. Aceng Hasani declares no conflict of interest. Odien Rosidin declares no conflict of interest.

Data Availability

The datasets and analyzed materials supporting the findings of this study are available from the corresponding author upon reasonable request.

Declaration of Artificial Intelligence (AI) Assistance

The authors declare that the generative artificial intelligence (AI) tool QuillBot was used exclusively for language editing and grammatical

improvement of the manuscript text. No generative AI tool was used to create, generate, or alter Figures 2 and 3; both figures are original screenshots of the e-module produced by the authors using Canva and FlipBuilder (Flip PDF Plus Pro). However, an AI-assisted tool was used to develop the video embedded in the e-module, including its AI-generated narration. This AI-assisted video was used as part of the e-module content and has been disclosed accordingly. The use of AI-assisted tools did not influence the scientific content, study design, data analysis, data interpretation, results, or conclusions of the manuscript. Full responsibility for the content remains with the authors.

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References

1. Agyeman NYB, Aphane VV. Enhancing Critical Thinking Through Interactive Learning Approaches for First-Year University Students. *J Res Initiat.* 2025;9(1):11. <https://digitalcommons.uncfsu.edu/jri/vol9/iss1/1>
2. Tressyalina T, Noveria E, Arief E, Wulandari E, Ramadani NT. Need Analysis of Interactive E-Worksheet as a Source of Digital Learning based on Local Wisdom in Learning Folklore Texts. *AAL-ISHLAH Jurnal Pendidikan.* 2023;15(2):2605-2613. doi:10.35445/alishlah.v15i2.2884
3. Nuraini H, Gailea N, Samanhudi U. Integrating Folklore in Modern Education: A Review of Interactive Materials and SDGs Alignment. *Jurnal Pendidikan Progresif.* 2025;15(4):2421-2442. doi:10.23960/jpp.v15i4.pp2421-2442
4. Wiono WJ, Meriza N. Environmental Issues-based Discovery Learning to Enhance Metacognitive Awareness and Students' Higher-Order Thinking Skills. *Tadris: J Kegur Ilmu Tarb.* 2022;7(1):35-45. doi:10.24042/tadris.v7i1.10464
5. Kovpik S. Development of Students' Critical Thinking Abilities Through Active Literary Analysis Approaches. *Ukr J Educ Stud Inf Technol.* 2023;11(1):26-37. doi:10.32919/uesit.2023.01.03.
6. Aguilar CJM, Pereira VAM, Gómez CDY, *et al.* Literacy Pedagogical Techniques to Improve Cognitive Processes in High School Students. *Universidad, Ciencia y Tecnología.* 2024;28(Special):287-98. doi:10.47460/uct.v28iSpecial.826
7. Delita F, Berutu N, Nofrion. Online Learning: The Effects of Using E-Modules on Self-Efficacy, Motivation and Learning Outcomes. *Turk Online J Distance Educ.* 2022;23(4):93-107. doi:10.17718/tojde.1182760
8. Arisanti R. The Role of Digital Technology in Improving Learning Outcomes: A Literature-Based Analysis. *PPSDP International Journal of Education.* 2025;4(2):574-81. doi:10.59175/pijed.v4i2.541.
9. Pradita LE, Rachmawati U. Development of Flipbook Learning Media for Students' Location in Indonesian Language Learning. *Matapena.* 2023;6(2):524-538. doi:10.36815/matapena.v6i02.2953.
10. Darmawan I, Heriyawati DF, Mustofa M, Romadhon MGE. Flipbook as a Learning Medium: A Study on Indonesian ESP Students. *Voices of English Language Education Society.* 2024;8(1):197-205. doi:10.29408/veles.v8i1.25137.
11. Nurhapsari HA, Handayani S. The Implementation of Digital Flipbook to Enhance Students' Reading Comprehension. *English Research Journal: Journal of Education, Language, Literature, Arts and Culture.* 2025;10(1). doi:10.33061/erj.v10i1.12166.
12. Elmiana DS, Zamzam A, Apgrianto K, Wahab ADA, Riyanto AA. Integrating Local Wisdom of Lombok Community into English Textbook. *ETERNAL (English, Teaching, Learning, and Research Journal).* 2024;10(1):33-45. doi:10.24252/Eternal.V10i1.2024.A3
13. Wahyuddin W, Ramli R, Anshari A. The Role of 'Assitalliang'-Based Learning Materials in Enhancing Cultural Awareness in Indonesian Language Learning at Higher Education Institutions. *J Ecohumanism.* 2025;4(3):431-436. doi:10.62754/joe.v4i3.6790.
14. Dick W, Carey L, Carey JO. *The Systematic Design of Instruction.* 9th ed. Hoboken, NJ: Pearson. 2022. <https://www.pearson.com/en-us/subject-catalog/p/systematic-design-of-instruction-the/P200000000952/9780137510344>
15. Warmbrod JR. Reporting and Interpreting Scores Derived from Likert-Type Scales. *J Agric Educ.* 2014;55(5):30-47. doi:10.5032/jae.2014.05030
16. Daud A, Supriusman, Rozalinda, Harfal Z, Suryani A, Nabilla O, Thahirah Z. The Development of Interactive E-Module Using Flipbookmaker for English Structure Learning at an Indonesian University. *Ta'dib.* 2022;25(2):160-176. doi:10.31958/jt.v25i2.7501
17. Anggraini P, Kusniarti T. The Insertion of Local Wisdom into Instructional Materials of Bahasa Indonesia for 10th Grade Students in Senior High School. *J Educ Pract.* 2015;6(33):89-92. <https://files.eric.ed.gov/fulltext/EJ1083666.pdf>
18. Hidayati D, Slamet J. Interactive Multimedia via LMS on a Reading Comprehension Course: Enhancing Engagement and Learning Outcomes in Islamic Higher Education. *J Stud Engl Lang.* 2025;20(1):95-122. doi:10.64731/jsel.v20i1.277426
19. Sucipta, Ahman E, Budiwati N. The Effect of the Guided Discovery Learning Method on Students' Critical Thinking Skills in Terms of Learning Motivation. *Indones J Econ Educ.* 2025;2(1). doi:10.17509/ijee.v2i1.10744.
20. Rahayuningsih SH, Asrowi, Gunarhadi, Ramli M. Meta-Analysis Effectiveness of Using the Discovery Learning Model on Students' 21st-Century Critical

- Thinking Skills. *J Penelit Pendidik IPA*. 2024;10(10). doi:10.29303/jppipa.v10i10.8961
21. Yansyah J, Santoso BW, Haryadi. Integrating Local Wisdom into Digital Storybooks: An Innovative Literacy Approach to Enhancing Elementary Students' Reading Interest. *J Cakrawala Pendas*. 2026;12(3):728-741. doi:10.31949/jcp.v12i3.18450
 22. Faustine S. Development of Character Education Based on Local Wisdom in East Java, Indonesia. *Indones J Local Wisdom Educ*. 2025;1(1):1-6. doi:10.26740/ijlwe.v1n1.p1-6
 23. Akbar A, Fitriati I, Ahyar, Suhada S, Hakim AR. Development of the BiTales Application to Improve Students' Local Wisdom-Based Digital Literacy. *J Inov Teknol Pembelajaran*. 2025;12(1):32-43. doi:10.17977/um031v12i12025p032
 24. Solong AF, Binendyk S, Maruanaya HJ. Where Culture Meets Technology: Developing a Digital Folklore E-Book for EFL Reading Comprehension. *Sanskara Pendidikan dan Pengajaran*. 2026;4(2):88-99. doi:10.58812/spp.v4i02.804
 25. Utama MMA, Sa'adi, Nursikin M, Khodijah DN, Afifah M. Digitalizing Local Wisdom: Innovation in Islamic Learning for Generation Z in Aceh. *Al-Tarbawi Al-Haditsah: J Pendidik Islam*. 2026;11(1):22-48. doi:10.24235/jf0r9w47

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