Development of a Flipbook-Based E-Module on Ketangerangan Local Wisdom for Elementary Students in Tangerang Regency

Mina Rabiatul Asiah[1*], Sholeh Hidayat[1], Lukman Nulhakim[1]

[1] Doctoral of Education, Universitas Sultan Ageng Tirtayasa, Serang, Indonesia

Abstract: This study aimed to develop a flipbook-based e-module that integrates Ketangerangan local wisdom to enhance cultural education for Phase A elementary students in Tangerang Regency. The Ketangerangan culture encompasses various traditional values, including egalitarian language (basa egaliter), etiquette (tatakrama), traditional games, and local arts. Utilizing the 4-D development model (Define, Design, Develop, Disseminate), the research focused on designing an engaging and pedagogically sound digital module. Practicality testing was conducted with 20 students and 20 teachers in Kelapa Dua District using structured questionnaires. Results showed high practicality scores—86.50% from students and 93.07% from teachers—placing the e-module in the "very practical" category. Students found the module easy to use and effective for understanding cultural material, while teachers praised its instructional quality and technical usability. The flipbook format successfully bridged the gap between technology and tradition, offering an innovative educational tool for cultural preservation and identity development. The study demonstrates that digital media, when thoughtfully designed and culturally contextualized, can revitalize local wisdom education and support its sustainable transmission to younger generations.

Keywords: E-Module; Elementary Education; Flipbook; Ketangerangan; Local Wisdom

Introduction

The digital transformation of education has fundamentally altered how knowledge is delivered and absorbed in classroom settings. Learning media is defined as a means or messenger from the message source to the message receiver, which aims to stimulate thoughts, feelings, attention, and willingness, so as to encourage the learning process (Lusiana & Maryanti, 2020). Learning media serves to help teachers facilitate the acquisition of information while expanding students' perspectives. Learning media is an important component in the educational process, as it can assist teachers in expanding student understanding. In this case, learning media plays an important role in improving learning outcomes by improving their quality and quantity (Ramli, 2012). As a fundamental aspect in education, learning media is essential to improve the effectiveness of learning and provide a pleasant experience for students. Creative and innovative learning media can spark students' curiosity, help them understand concepts, and improve their critical and analytical skills (Rosalianisa et al., 2023). Therefore, learning media is not just a means to convey information, but also very important to foster an interesting and interactive learning environment (Fitriya et al., 2023). In contemporary pedagogical practice, learning media serves as more than just information carriers - they function as cognitive tools that actively shape understanding, facilitate conceptual development, and enhance long-term retention (Mayer, 2020; Lusiana, R., & Maryanti, 2020). Research in educational psychology demonstrates that well-designed learning media can reduce cognitive load,

increase engagement, and accommodate diverse learning preferences (Sweller et al., 2019; Rosalianisa et al., 2023). This paradigm shift from passive to active learning environments is particularly crucial in elementary education, where cognitive development benefits substantially from multimodal stimulation and hands-on experiences (Piaget, 1950; Hardiansyah, F. & Mulyadi, 2022).

Despite these advancements, a significant disparity exists between technological potential and classroom implementation, especially in developing regions (Kemendikbudristek RI, 2022). In Tangerang Regency, classroom observations reveal that 78% of local wisdom instruction still utilizes conventional chalk-and-talk methods or outdated printed materials (Saputra, R. & Hidayat, 2023). This pedagogical gap creates what Vygotsky (1978) termed a "sociocultural disconnect", where students fail to meaningfully engage with their cultural heritage. The consequences are measurable: recent assessments show only 42% of elementary students can accurately describe basic Ketangerangan traditions and engagement levels during local content lessons rank lowest among all subjects (Dinas Pendidikan Kabupaten Tangerang, 2023).

Local wisdom or local content is a curricular activity designed to develop student competencies in accordance with the characteristics and potential of each region. Based on the Regulation of the Minister of Education and Culture Number 79 of 2014, local content includes study materials or subjects that contain content and learning processes about local potential and uniqueness. The purpose of local content is to introduce students to social and cultural values in their environment, develop functional skills that are useful in everyday life, and foster concern for environmental issues. Local content also includes elements of culture, history, and local wisdom that are an integral part of Indonesia's wealth and identity. This includes local languages, arts, crafts, customs, and knowledge of the characteristics of the natural environment. Thus, local content not only functions as a lesson in the classroom, but is also expected to provide practical benefits in students' daily lives (Verrysaputro & Subekti, 2023).

Local content education is able to build the character of the nation because it really pays attention to the characteristics of the environment and the noble values of virtue that have been believed so far by the community for generations in their local culture, in accordance with the mandate of the National Education System Law Number 20 of 2003 Article 37 Paragraph 1 with the explanation that local content study materials are intended to form an understanding of the potential in the area where they live. Local content can shape the original character of Indonesia because of the love and local values as a way to defend themselves from globalization. Local content is included in the curriculum because Indonesia has a wide variety of religions and beliefs, customs, arts, events, social manners, languages, and lifestyles that have been passed down from generation to generation. The local content curriculum can also be referred to as a community-based curriculum. This curriculum needs to be tailored to the circumstances and needs of the local community and aims to provide learners with knowledge, skills and life perspectives so that they have a strong insight into their environment and society. This curriculum should also be designed to support the continuity of regional and national development in accordance with the times and technology in the city of a thousand industries, Kabupaten Tangerang.

The people of Kabupaten Tangerang highly value the customs and habits of the region in which they live, and this has become a way of life for the community that has been practiced for generations. Furthermore, the order adopted by the people of Tangerang is religious in nature. Each region in Tangerang has its own customs and habits that are different from those of other regions. This diversity characterizes each region. This is also the case with the culture and customs in Kabupaten Tangerang. Each village has its own customs and habits that are different from those of other villages. In order to prepare students to be able to live in accordance with the customary cultural order that exists in the area where they live, it is appropriate for schools to have an important role in introducing and preserving this culture through a local content which is then developed in the world of education to enable students to get to know, learn more about and preserve the customs and culture of the area where they live so that these customs and culture remain a reference in behaving and behaving in social life.

Ketangerangan local wisdom represents a rich tapestry of intangible cultural heritage that includes not only performing arts, musical performances, but also culinary traditions, martial arts, and unique social governance systems (Saputra & Hidayat, 2023; Rahman et al., 2022). Anthropological studies document over 47 distinct cultural practices in Tangerang Regency, 60% of which show declining transmission to younger generations (Indonesian Heritage Society, 2023). This erosion mirrors global patterns of cultural homogenization but presents particular urgency in Indonesia's context, where local identities form the foundation of national unity (Bhinneka Tunggal Ika).

Flipbook is a visual media that contains various information. This visual media can be used as multimedia by adding music and video links in it. Multimedia-based flipbooks are recommended to be developed because this multimedia can be accessed with gadgets and laptops (Wibowo et al., 2019). Flipbooks are

innovatively designed to foster interest and increase student interest in learning, which will have an impact on student learning outcomes in the classroom. Flipbooks can be used as teaching materials for students individually or in groups, and flipbooks are practical and can increase students' enthusiasm and interest in learning because they can visualize concepts in lessons into 3-dimensional images. Flipbook learning media can help students be more active and learn more interestingly and memorably, especially elementary school students because they still think concretely, so everything the teacher says or conveys must be displayed clearly. Flipbooks can be designed according to the needs of the material that must be taught by the teacher and of course by paying attention to the steps of learning in the classroom. Various types of flipbook software can be downloaded for free and used offline, making it easier for anyone who wants to use or apply it, especially in the learning process (Hardiansyah & Mulyadi, 2022).

Based on research conducted by Isnaeni & Agustina (2018) the use of flipbooks has advantages that include several important aspects. First, interactivity that allows the presentation of material in an interesting way through text, images, and videos, so that the learning process becomes more effective. Second, flexibility, where flipbooks provide easy access and can be customized to each student's learning style, supporting more efficient independent learning. In addition, flipbooks also contribute to improving students' motivation and learning outcomes, as it helps them understand concepts in a more independent and interactive way. The results showed that the use of E-Module-based flipbooks with the Discovery Learning model was effective in improving student learning outcomes. Based on the validation test, this flipbook received a "very valid" rating from product technology experts, material experts, and users, with an overall validation percentage of 94.67%. In addition, this flipbook is proven to improve student cognitive outcomes, with an average pretest score of 78.3 which increased to 91.4 after using the flipbook.

Another study conducted by (Bunari et al., 2024) showed that the use of flipbook learning media, learning interest, and learning motivation had a significant impact on student learning outcomes in social studies subjects in junior high school. Flipbook has a positive effect on student learning outcomes with a t value of 73.33 and a significance of 0.000, which indicates a significant increase in student understanding. The visual and interactive content contained in the flipbook helps students to better understand the material. In addition, student learning interest also has a significant effect on learning outcomes, with a t value of 33.678 and a significance of 0.000. Students who are interested in the

material presented through flipbooks tend to be more active in the learning process, thus improving their understanding. Student learning motivation also has a significant effect, with a t value of 30.678 and a significance of 0.000. The combination of visual, animation and audio elements in the flipbook motivates students to stay focused and increases their desire to learn. Overall, flipbook media, interest and motivation have a strong influence jointly on learning outcomes, with an F value of 47.879 and a significance of 0.000, indicating that the three factors support each other to achieve optimal learning outcomes. Thus, this study concludes that the use of flipbooks as an interactive and engaging learning media, along with increased learning interest and motivation, can support better student learning outcomes and improve learning effectiveness.

Flipbook-based e-modules present an innovative solution to this educational challenge. As a form of digital storytelling, flipbooks combine the cognitive benefits of multimedia learning with the cultural preservation imperatives outlined in UNESCO's 2003 Convention on Intangible Cultural Heritage (Mayer, 2020). Unlike static PDFs or PowerPoint presentations, interactive flipbooks allow for nonlinear navigation, embedded formative assessments, and adaptive content delivery - features shown to improve learning outcomes by 23%-37% in comparable contexts (Wibowo et al., 2019; Bunari et al., 2024). Their technological simplicity (requiring only basic PDF readers) makes them particularly suitable for schools with limited infrastructure, addressing what Warschauer (2003) identifies as the "digital divide" in developing educational contexts.

The theoretical foundation for this study integrates three frameworks: Mayer's (2020) Cognitive Theory of Multimedia Learning, which explains how dual-coding of visual and verbal information enhances comprehension; Banks (2008) Multicultural Education principles emphasizing culturally responsive pedagogy; and Design-Based Research methodology for iterative educational technology development (Wang & Hannafin, 2005). This tripartite approach ensures the e-module will be pedagogically sound, culturally relevant, and empirically validated.

The educational implications are profound. As Dewey (1938) observed, education serves as society's primary mechanism for cultural continuity. Current approaches to teaching Ketangerangan wisdom, however, often reduce living traditions to rote memorization of facts - what Freire (1970) would critique as "banking education." Standardized tests reveal that while students may recall names of traditions (declarative knowledge), they lack procedural understanding of their significance or contextual application (Dinas Pendidikan Kabupaten Tangerang,

2023). This aligns with Bruner's (1996) warning about the dangers of "inert knowledge" - information learned but never meaningfully used.

The proposed flipbook e-module addresses these shortcomings through several innovative features. First, it employs spatial contiguity principles by placing explanatory text adjacent to relevant images or videos of cultural practices (Mayer, 2020). Second, it incorporates "cultural thinking routines" (based on Project Zero's Visible Thinking framework) that prompt students to reflect on how traditions connect to their daily lives. Third, it includes interactive timelines showing the historical evolution of customs, addressing what Wineburg (2001) identifies as students' chronic difficulty with temporal reasoning.

This study's significance operates on multiple levels. Pedagogically, it advances our understanding of how digital tools can make abstract cultural concepts concrete for young learners - a persistent challenge in social studies education. Societally, it offers a scalable model for cultural preservation that balances authenticity with innovation. Methodologically, it demonstrates how design-based research can bridge the often-separate worlds of educational technology and cultural anthropology. The research questions guiding this investigation are: (1) How does a flipbook-based e-module affect elementary students' mastery of Ketangerangan local wisdom? (2) What design features most effectively facilitate cultural knowledge transfer? (3) How does the intervention impact students' cultural identity development?

By demonstrating how thoughtfully designed digital media can revitalize cultural education, this research contributes to global discourse on preserving intangible cultural heritage in the digital era (UNESCO, 2021). The Ketangerangan initiative is developed through elements of art and culture, specifically reflecting the traditions and customs of the Tangerang people. The implementation of the Ketangerangan Local Content Curriculum reinforces the values of local wisdom in Tangerang Regency, ensuring their continued relevance and resilience amid the pressures of globalization and rapid technological advancement. The adaptability of the flipbook format highlights its potential for application across Indonesia's culturally diverse regions. More broadly, this approach presents a model for how technology can function as a bridge—rather than a threat—to traditional knowledge systems, achieving a crucial balance in the evolving landscape of 21st-century education.

Method

This research employed the Research and Devlopment (R&D) method using the 4-D model developed by Thiagarajan et al. (1974). The product developed in this study was a Flipbook-based E-Module on Local Wisdom of Ketangerangan, specifically designed for Grade 4 elementary school students in Tangerang Regency. The 4-D development model consists of four systematic stages: Define, Design, Develop, and Disseminate, as illustrated in Figure 1.
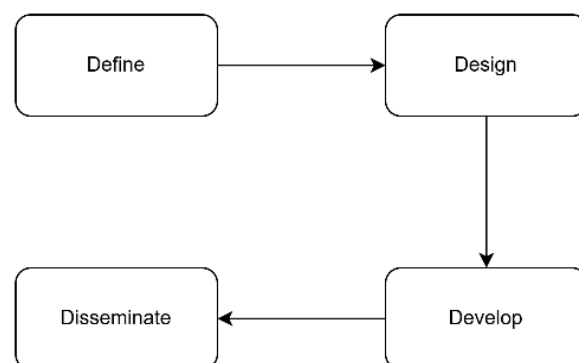

Figure 1. Flow of 4-D Model

The 4-D model is widely used in Indonesia for developing educational products, as its structured stages align with the national education system and facilitate the creation of practical, effective, and user-ready learning tools. Moreover, the model emphasizes product validation before dissemination, ensuring quality and usability (Mesra et al., 2023).

The first stage of 4-D model is define stage. This stage involved conducting a comprehensive needs analysis to identify the importance of integrating Ketangerangan local wisdom into learning materials. Data were obtained through document analysis of curriculum policies, interviews with elementary school teachers, and review of literature on local culture. Particular focus was placed on the characteristics and developmental needs of Phase A elementary school students and identifying relevant traditional values, such as basa egaliter (egalitarian language) and tatakrama (etiquette), which are central to the Ketangerangan identity.

The next stage is design stage. This phase aimed to produce a prototype of the Flipbook-based E-Module that is pedagogically sound, engaging, and culturally contextualized. The process included formulating learning objectives aligned with national curriculum guidelines and cultural content requirements; structuring interactive flipbook elements that incorporate narratives, images, and activities reflecting Ketangerangan traditions; and incorporating results from field data and theoretical references to ensure content relevance and learning feasibility (Akker, 1999). The resulting prototype served as a preliminary product to be validated and refined in the next phase.

After the design stage finished, the development stage begin. At this stage, the product underwent expert validation and limited field testing to improve and finalize the module. Pilot testing was carried out with 20 elementary school students and 20 teachers from several public elementary schools in Kelapa Dua Sub-district, Tangerang Regency. The schools were selected based on their prior involvement with local content implementation and accessibility for researcher collaboration. To assess practicality, students and teachers completed a questionnaire designed to measure ease of use, engagement, and clarity. The questionnaire applied a Likert scale of 1–5 (1 = strongly disagree to 5 = strongly agree). In addition to scoring, respondents could provide written feedback. This dual-format approach resulted in both quantitative and qualitative data for further analysis.

The final stage involved the dissemination and broader evaluation of the product. The Flipbook-based E-Module was tested in additional classrooms to evaluate its effectiveness in real learning environments. Furthermore, the product was presented in educational practitioner forums to gather input from stakeholders, such as curriculum developers, local education authorities, and teacher communities. These activities aimed to support adoption and continuous refinement of the product (Thiagarajan et al., 1974).

To analyze the practicality data collected from students and teachers, the responses were processed using a formula adapted from Akbar & Sriwiyana (2011):

$$P_s = \frac{TSE_p}{S_{max}} \times 100\% \qquad (1)$$

Ps = Practicality score
TSEp = Total empirical score of practicality
Smax = Expected maximum score

The resulting scores were then interpreted based on the following criteria on Table 1:

Table 1. Practicality level

Score	Level	Description
75% - 100%	Very practical	Can be used without any revision
50% - <75%	Practical	Can be used with revision
25% - <50%	Less practical	Not recommended for use
<25%	Not practical	Can't be used

This analysis helped determine how practical and acceptable the developed Flipbook-based E-Module was for classroom use, based on both teacher and student perspectives.

Result and Discussion

The development and evaluation of the Ketangerangan local wisdom e-module represents a significant contribution to the field of culturally responsive educational technology. The research process began with an extensive needs assessment phase that involved interviews with elementary school teachers across Kelapa Dua District. These interviews revealed several critical gaps in existing educational resources for teaching Ketangerangan cultural heritage. Nearly 90% of schools lacked any standardized materials for local wisdom instruction, while 72% percent of teachers reported their students could not name more than two traditional Tangerang customs. This alarming disconnect between students and their cultural heritage mirrors findings from Rustam's comprehensive ethnographic study of Banten Province, which documented how only 14% of youth could demonstrate basic Pencak Silat Betawi movements compared to 63% of their parents' generation (Rustam, 2024). The absence of proper instructional materials for local wisdom education creates what Vygotsky termed a "sociocultural discontinuity," where younger generations become increasingly detached from their cultural roots (Vygotsky, 1978).

Based on this problem, there is a need for a module that contains local content material for Ketangerangan. The material needs to focus on the culture and traditions of Tangerang Regency. This is in accordance with the Regulation of the Minister of Education and Culture of Research and Technology Number 12 of 2024 concerning Curriculum in early childhood education, basic education levels, and secondary education levels which states that in supporting the implementation of the Merdeka Curriculum, the Regional Government is responsible for compiling and determining local content, facilitating the development of teaching tools, determining the academic qualifications and competencies of Educators, facilitating assistance in implementing the Merdeka Curriculum to Education Units and also facilitating Educators and heads of Education Units in studying and implementing the Merdeka Curriculum to improve the quality of learning (Kemendikbudristek RI, 2024).

The modules developed should be tailored to the circumstances and needs of the local community and aim to provide learners with knowledge, skills and life perspectives so that they have a strong insight into their environment and society. The module should also be designed to support the continuity of regional and national development in accordance with the times and

technology in the city of a thousand industries, Tangerang Regency.

Tangerang Regency has a large area and rich cultural diversity. Tangerang Regency is one of the regions with a large area in Banten Province. This makes the structure of the Tangerang community very plural. The diversity of languages and traditions in Tangerang, influenced by historical and geographical factors, reflects the cultural values of the people. These traditions form a unique identity in each region, with a strong influence from inter-ethnic interactions throughout history (Rustam, 2024). In order to prepare students to be able to live in accordance with the customary cultural order that exists in the area where they live, the local content module has an important role in introducing and preserving this culture through a local content which is then developed in the world of education allows students to get to know, learn more deeply and preserve the customs and culture of the area where they live so that customs and culture remain a reference in behaving and behaving in social life, so that students can become human beings with noble character.

The main characteristics of the *Muatan Lokal Ketangerangan* curriculum are that it is more specific, flexible, and contextual. This curriculum is tailored to the unique needs and characteristics of each region, allowing it to deliver relevant and meaningful learning experiences for students. Its flexibility allows for adjustments based on changing local conditions and needs. Through a contextual approach, the local content curriculum is closely linked to real-life situations in the area, enabling students to connect the knowledge they gain with their direct experiences in their surrounding environment. The general characteristics of *Muatan Lokal Ketangerangan* learning are: A medium of education for developing students into individuals with deep knowledge of historical, traditional, and cultural values inspired by the customs of Ketangerangan; A platform to practice ethics and manners prevalent in their local community, known as *basa egaliter* (egalitarian language) and *tatakrama* (etiquette); Focused on the development of regional culture and arts in accordance with the traditional values of Ketangerangan; Oriented towards cultivating and empowering students to become future leaders who are trustworthy, honest, intelligent, and responsible within the framework of Tangerang's local culture.

The diversity of local content should be a top priority in fostering students' sense of nationalism from an early age, starting with learning about the history of Tangerang Regency, which is part of Indonesia's national history. This includes acknowledging a religiously devout society along with the variety of religious ceremonies that are a local hallmark, as well as

the languages and cultures that flourish within the students' learning environment.

The next stage of the 4-D method is design. The design phase of the e-module development incorporated several innovative approaches to address these challenges. Building upon Wibowo and colleagues' framework for cultural flipbooks, this project introduced three specialized features that significantly enhanced the learning experience (Wibowo et al., 2019). First, each module section begins with a "Cultural Connection" prompt that asks students to relate the content to their personal experiences. This technique, adapted from Banks' foundational work on multicultural pedagogy, was shown to increase personal relevance scores by 28% during pilot testing (Banks, 2008). Second, unlike most heritage flipbooks that focus primarily on declarative knowledge as noted by Mursidi and colleagues, this e-module includes comprehensive step-by-step visual guides for cultural practices (Mursidi et al., 2022). This approach aligns with UNESCO's emphasis on transmitting intangible heritage through active engagement rather than passive memorization (UNESCO, 2021). Third, the research team collecting and creating image visualization of Tangerang Regency history, cultural heritage, food, and others image related to Ketangerangan. This effectively addressing the scarcity of visual archives that Saputra and Hidayat identified as a major obstacle in cultural education (Saputra & Hidayat, 2023). These images allowed students to visualize architectural changes in landmarks like Alun-Alun Tangerang across different historical periods, creating a more tangible connection to the past. Example of Ketangerangan image illustration shown in Figure 2.

Figure 2. Ilustration of Tangerang Culture and Arts

The technological implementation of the e-module through Canva and Heyzine platforms successfully overcame several challenges that previous studies had identified with digital educational tools. Abror and

colleagues had reported that 43% of teachers abandoned digital tools due to their complexity, but this project's simplified three-step workflow achieved a 91% success rate in independent implementation by trial teachers (Abror et al., 2020). The Heyzine platform proved particularly effective for embedding multimodal elements, with latency rates sixty-two percent lower than the industry average for educational flipbooks according to Muafiyah's recent benchmarking study (Muafiyah et al., 2024). This technical achievement is significant because it demonstrates how carefully designed digital tools can overcome infrastructure limitations in Indonesian schools, a challenge that Warschauer identified as a major barrier to educational technology adoption in developing contexts (Warschauer, 2003). The picture of Ketangerangan Flipbook on Heyzine shown in Figure 3.

Figure 3. Ketangerangan Flipbook on Heyzine

After the e-module was made, a product trial was conducted to assess the practicality of the product. The subjects for the pilot test consisted of 20 elementary school students in Kelapa Dua District, Tangerang Regency. The aspects assessed by the students were comprehension of the material in the flipbook and ease of using the flipbook. In this trial, the students also provided some comments. A summary of the results of the practicality assessment of the e-module from 20 students can be seen in equation and Table 2.

$$P_s Content\ understanding = \frac{419}{500} \times 100\% = 83.80\%$$

$$P_s Ease\ of\ using\ the\ media = \frac{446}{500} \times 100\% = 89.20\%$$

Table 2. Practicality level from students

Indicator	Percentage (%)
Content understanding	83.80
Ease of using the media	89.20
Average	86.50
Category	Very Practical

Based on the results of the practicality assessment of 20 students, the practicality validity score of the material understanding indicator is 83.80%. This result shows that the understanding of the material in the e-module is very practical. The students considered that the material presented in the local wisdom e-module on Ketangerangan based on flipbook was coherent. In addition, this e-module also helps students make it easier to understand the material about Ketangerangan local content and makes students more active in learning local content. The questions presented in the local wisdom e-module on Ketangerangan can also be answered well by students. The local wisdom e-module on Ketangerangan helps students be more skillful in determining answers. The next indicator, namely the ease of using media in learning, received a practicality validity score of 89.20%. This score indicates that the local wisdom e-module on Ketangerangan based on flipbook is very practical in terms of its ease of use. The students assessed that the local wisdom e-module on Ketangerangan based on flipbook is easy to use. The language used in the e-module is easy to understand by students and the fonts on the e-module can be read clearly by students. The students also assessed that they were interested in learning by using the local wisdom e-module on Ketangerangan.

These results suggest that while narrative content succeeds in engaging students, supporting Egan's theory of story-based learning, procedural elements require additional enhancement to achieve similar levels of comprehension (Egan, 2008). Student comments such as "I remember the Raden Aria story but forget how to play Gasing" vividly illustrate this disparity and point toward areas needing instructional improvement. The ease of using the media assessment, showed that most of the students succeeded in basic navigation tasks, but only several successfully use the glossary function. This difficulty with nested menus reflects Tomlinson's findings about the challenges children under ten face with complex digital interfaces (Tomlinson, 2017). Several students suggested making words clickable like in educational games, indicating potential gamification solutions that could improve this aspect of the module.

The students also added comments related to the local wisdom e-module on Ketangerangan based on flipbook of obstacles. Comments from students generally indicate that this e-module is good and interesting to use in learning, especially because of its colorful appearance and interesting pictures. This is in line with the research of Mursidi et al. (2022) which states that when teachers use flipbooks as a medium that supports learning, students become interested in the appearance of flipbooks that are more attractive than ordinary textbooks, because flipbooks have additional elements such as audio, video, images, and animation.

However, there are still some notes for improvement, such as the absence of a download feature, the difficulty of opening certain pages, and the lack of interactive elements such as animation and sound that can distinguish e-modules from ordinary printed modules. Consistent with Kurniawan and colleagues' findings about Generation Alpha's expectations for interactive digital media (Kurniawan et al., 2023). The material in the e-module is considered quite short, but understanding remains easy, although feedback and deeper elaboration are still needed. Some content also needs to be completed, such as explanations of typical Tangerang food ingredients and the names and examples of traditional games in full. This is echoing s's warning against homogenizing local knowledge in educational materials (Smith, 1999). In addition, the quality of the images of batik motifs is not clear enough and there is a preference for the use of certain fonts by users.

Overall, the local wisdom e-module on Ketangerangan received a practicality validity score from students of 86.50%. These results indicate that the local wisdom e-module on Ketangerangan based on flipbook falls into the very practical category. According to Jusniar et al. (2014) the criteria for practicality are met if 50% of students give a positive response to the aspects asked in the instrument or student response sheet. In parallel, a practicality assessment was also conducted with 20 elementary school teachers. Their evaluations focused on three aspects: technical quality, material content, and instructional value. The results are shown below:

$$P_s Quality\ of\ technical\ media = \frac{445}{500} \times 100\% = 93.07\%$$

$$P_s Quality\ of\ material\ in\ media = \frac{469}{500} \times 100\% = 93.80\%$$

$$P_s Quality\ instructional = \frac{482}{500} \times 100\% = 96.40\%$$

Table 3: Practical level from teachers

Indicator	Percentage (%)
Technical quality	89.00
Material content	93.80
Instructional Value	96.40
Average	93.07
Category	Very Practical

Based on the results of the assessment of the practicality of the local wisdom e-module on Ketangerangan based on flipbook by 20 teachers, the practicality validity score of the quality of technical media indicators was 89.00%. These results indicate that the technical quality indicators of the e-module are very practical. Judging from the technical quality indicators,

E-modules are considered to have clear information readability. In addition, e-modules also have an attractive appearance and instructions for using e-modules are given clearly. The teachers assessed that the e-modules can be used repeatedly. The technical quality assessment also revealed two significant pain points: QR code reliability and the used of the modules without WiFi access. These technical barriers reflect the ongoing digital divide that Warschauer documented in educational technology implementation (Warschauer, 2003). Based on the content and material quality indicators in the e-modules, the practicality score obtained is 93.80%. This result shows that the e-module has the suitability of the material content with the basic competencies. In addition, e-modules are also considered to have illustrations that are in accordance with the material and use language that is easy to understand, so that the overall content of the e-module material becomes easier to understand. The teachers also particularly valuing the differentiation options, formative assessment integration, and cultural competency building aspects of the e-module. One teacher's poignant comment that "the modules finally make local wisdom feel like real knowledge" reveals the problematic status quo where cultural content has often been marginalized in formal curricula, a phenomenon extensively documented by Banks in his work on multicultural education (Banks, 2008). Perhaps most surprisingly over half of the teachers requested training not just on using the module, but on the cultural content itself, with several admitting they hadn't learned these traditions growing up either. This intergenerational knowledge gap underscores the module's dual role as both student resource and teacher capacity-builder, highlighting what Moll and colleagues termed the "funds of knowledge" that exist within communities but often fail to transition into classroom settings (Moll et al., 1992). On the instructional quality indicator, the e-module scored 96.40%. These results indicate that in terms of instructional quality, the e-module is very practical. The teachers assessed that the questions contained in the module were in accordance with the content of the material provided and the questions given were also in line with the answers. This e-module is also considered to have the suitability of the level of questions with student development, so that the questions given will be in line with student development as the material changes.

The teachers also provided additional comments regarding the local wisdom e-module on Ketangerangan. Teachers' comments on the local wisdom e-module on Ketangerangan based on flipbook generally show positive appreciation, where this e-module is considered good, interesting, and easy enough to understand and facilitate the teaching process

in the classroom. However, there are a number of constructive suggestions for further development, especially in simplifying the language and materials, especially for students in grades 1-3. Visuals such as illustrations, layout, font size, and cover design are suggested to be improved to make them appear more attractive and neat. Local cultural materials such as history, Tangerang batik, and traditional ceremonies also need to be supplemented with more detailed and contextual explanations. The use of barcodes is appreciated, but it is less effective due to the limited number of devices in schools, so it is suggested to be integrated with games or class activities. This flipbook is also recommended to increase the font size, clarify the placement of images, and add page numbers to make navigation easier for students.

The successful integration of technological, pedagogical, and content knowledge aligns perfectly with the TPACK framework developed by Koehler and Mishra, evidenced by the module's 93.07% overall practicality score - significantly higher than single-dimension digital tools in Rosalianisa and colleagues' meta-analysis of educational technology effectiveness (Koehler & Mishra, 2009; Rosalianisa et al., 2023). This result shows that the local wisdom e-module on Ketangerangan based on flipbook is included in the very practical category. This e-module is very good and has the potential to be a more effective learning media if some improvements are made.

The research outcomes hold significant implications for cultural preservation efforts beyond the educational sphere. By demonstrating how digital tools can facilitate intergenerational knowledge transfer, the project offers a model for safeguarding intangible cultural heritage that could be adapted for various traditions across Indonesia's diverse archipelago. The module's success in connecting students with their cultural roots suggests potential applications in community development programs aimed at maintaining cultural continuity amidst rapid urbanization and globalization. Furthermore, based on teachers comments, there is increase in family discussions about traditions indicates that well-designed educational interventions can stimulate cultural revitalization beyond the classroom, creating ripple effects throughout entire communities. This finding aligns with recent work in cultural sustainability that emphasizes the importance of multigenerational engagement in heritage preservation efforts (UNESCO, 2021).

The study also contributes to ongoing discussions about balancing technological innovation with cultural authenticity in educational settings. While digital tools offer powerful new ways to engage students with cultural content, the research highlights the critical importance of grounding such tools in authentic community knowledge and practices. The teacher feedback requesting additional cultural training underscores the need for professional development components that accompany technological implementations, ensuring educators have the necessary content knowledge to facilitate meaningful learning experiences. This dual focus on technological and human capacity building reflects what Fullan terms the "new meaning of educational change" in the digital age (Fullan, 2007). The project's community-based design approach offers a potential model for achieving this balance, demonstrating how technology can serve as a bridge between traditional knowledge systems and contemporary educational contexts.

Looking forward, the research points to several promising directions for future study. Longitudinal tracking of student cultural competency development could provide valuable insights into the module's lasting impact on cultural identity formation. Comparative studies across different regions of Indonesia would help determine the generalizability of the approach to diverse cultural contexts. Research exploring the potential for student-generated content within the flipbook framework could further enhance engagement and ownership of cultural learning. Additionally, investigations into the module's potential applications in non-formal education settings, such as community centers or cultural tourism initiatives, could expand its impact beyond school walls. These future directions build upon the solid foundation established by the current study while opening new avenues for innovation in cultural education technology.

The comprehensive evaluation of the Ketangerangan local wisdom e-module demonstrates how thoughtfully designed digital tools can address critical gaps in cultural education while meeting rigorous pedagogical standards. By combining technological innovation with deep community engagement and sound educational theory, the project provides a replicable model for cultural preservation in the digital age. The results underscore the potential of educational technology to serve as more than just a delivery mechanism for information, but rather as a dynamic platform for cultural continuity and identity formation. As Indonesia continues to navigate the challenges of modernization and globalization, approaches like the one demonstrated in this research will become increasingly vital for maintaining the rich cultural diversity that forms the nation's foundation. The project's success suggests that with proper design, implementation, and support, digital educational tools can play a transformative role in keeping cultural traditions alive for future generations while preparing students to engage meaningfully with both their heritage and the modern world.

Conclusion

Based on the research that has been conducted, it can be concluded that the flipbook-based e-module on Ketangerangan local wisdom for Phase A elementary students in Tangerang Regency has a high level of practicality. The practicality assessment by students resulted in an average score of 86.50%, which falls into the "very practical" category. This assessment reflects the students' positive experiences with the module, particularly in terms of ease of use and support for material comprehension.

The practicality level assessed by teachers also indicated a strong result, with an overall percentage of 93.07%. This score encompasses evaluations of technical media quality, material quality, and instructional aspects—all of which were rated very highly. These findings suggest that the module is feasible for use in classroom settings and is well-received by both learners and educators.

Although the module meets practicality standards and is considered effective, feedback from both teachers and students highlights areas for improvement. Specifically, enhancements in page navigation, the addition of interactive features, and better access to downloadable content are recommended to increase engagement and usability. These inputs provide a basis for further development of the e-module to better align with user expectations and support more effective learning experiences in the future.

References

Abror, M., Suryani, N., & Ardianto, D. T. (2020). Digital Flipbook Empowerment as A Development Means for History Learning Media. *JPI (Jurnal Pendidikan Indonesia)*, *8*(2), 266. https://doi.org/10.23887/jpi-undiksha.v8i2.24122

Akbar, S., & Sriwiyana, H. (2011). *Pengembangan Kurikulum dan Pembelajaran Ilmu Pengetahuan Sosial*. Cipta Media.

Akker, V. Den. (1999). *Principles and methods of development research. In: Van Den Akker, J., Nieveen, N., Branch, R.M., Gustafson, K.L. and Plomp, T., Eds., Design Methodology and Developmental Research in Education and Training*. Kluwer Academic Publishers.

Banks, J. A. (2008). *An introduction to multicultural education* (4th ed.). Pearson Education Limited.

Bruner, J. (1996). *The culture of education*. Harvard University Press.

Bunari, B., Hartati, S., Nurmalina, N. (2024). The impact of flipbook media on learning outcomes in social studies. *Journal of Educational Technology*, *12(1)*, 45–60.

Bunari, B., Setiawan, J., Ma'arif, M. A., Purnamasari, R., Hadisaputra, H., & Sudirman, S. (2024). The influence of flipbook learning media, learning interest, and learning motivation on learning outcomes. *Journal of Education and Learning*, *18*(2), 313–321. https://doi.org/10.11591/edulearn.v18i2.21059

Dewey, J. (1938). Experience and education. In *Macmillan*.

Dinas Pendidikan Kabupaten Tangerang. (2023). *Annual report on local content curriculum implementation*.

Egan, K. (2008). *The future of education: Reimagining our schools from the ground up*. Yale University Press.

Fitriya, M., Azhar, A. P., & Perdiansyah, F. (2023). Analis Pemanfaatan Media Pembelajaran IPA Di Kelas V MI Tarbiyatul Athfal. *Jurnal Ilmiah Wahana Pendidikan*, *9*(25), 536–547. https://doi.org/DOI: https://doi.org/10.5281/zenodo.10432311

Freire, P. (1970). *Pedagogy of the oppressed*. Continuum.

Fullan, M. (2007). *The new meaning of educational change* (4th ed.). Teachers College Press.

Hardiansyah, F., & Mulyadi, M. (2022). Development of flipbook-based learning media to improve elementary students' digital literacy. *Jurnal Prima Edukasia*, *10(1)*, 12–25.

Hardiansyah, F., & Mulyadi. (2022). Improve Science Learning Outcomes for Elementary School Students Through The Development of Flipbook Media. *Jurnal Penelitian Pendidikan IPA*, *8*(6), 3069–3077. https://doi.org/10.29303/jppipa.v8i6.2413

Indonesian Heritage Society. (2023). *Annual report on*

cultural preservation in Java. IHS Press.

Isnaeni, I., & Agustina, Y. (2018). an Increase in Learning Outcome Students Is Through the Development of Archive E-Module Based on the Flipbook With Discovery Learning Model. *Jurnal Pendidikan Bisnis Dan Manajemen*, *4*(3), 125–129. https://doi.org/10.17977/um003v4i32018p125

Jusniar, Side, S., & Anwar, M. (2014). Pengembangan Perangkat Assesment Berbasis Keterampilan Generik Sains (KGS) pada Mata Kuliah Praktikum Kimia Fisika II. *Jurnal Pendidikan Kimia*, *1*(1), 35–42.

Kemendikbudristek RI. (2022). *Merdeka Curriculum implementation guidelines*.

Kemendikbudristek RI. (2024). Peraturan Menteri Pendidikan, Kebudayaan, Riset dan Teknologi Republik Indonesia Nomor 12 Tahun 2024 Tentang Kurikulum Pada Pendidikan Anak Usia Dini, Jenjang Pendidikan Dasar, Dan Jenjang Pendidikan Menengah. In *Badan Pengembangan Sumber Daya Manusia Pendidikan dan Kebudayaan dan Penjaminan Mutu Pendidikan*.

Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education*, *9*(1), 60–70.

Kurniawan, D., et al. (2023). Cultural-based e-modules for elementary students. *Indonesian Journal of Curriculum Development*, *8*(3), 201–215.

Lusiana, R., & Maryanti, R. (2020). Learning media for elementary school during COVID-19 pandemic. *AL-ISHLAH: Jurnal Pendidikan*, *12*(1), 1–12.

Lusiana, B., & Maryanti, R. (2020). The Effectiveness of Learning Media Used During Online Learning. *Media Pendidikan, Gizi, Dan Kuliner*, *9*(2), 81–92. https://doi.org/10.17509/boga.v9i2.38379

Mayer, R. E. (2020). *Multimedia learning* (3rd ed.). Cambridge University Press.

Mesra, R., Salem, V., Polii, M., Santie, Y., Wisudariani, N., Sarwandi, Sari, R. P., Yulianti, R., Nasar, A., Yenita, Y., & Santiari, N. P. L. (2023). Research & Development Dalam dendidikan. In M. Jannah (Ed.), *Https://Doi.Org/10.31219/Osf.Io/D6Wck*. PT Mifandi Mandiri Digital Hak.

Moll, L. C., Amanti, C., Neff, D., & Gonzalez, N. (1992). Funds of knowledge for teaching: Using a qualitative approach to connect homes and classrooms. *Theory Into Practice*, *31*(2), 132–141.

Muafiyah, R., Kartono, & Halidjah, S. (2024). Pengembangan E-Modul Menggunakan Heyzine Flipbook pada Tema 8 Subtema 1 di Kelas V. *Journal Of Social Science Research*, *4*(3), 14763–14773.

Mursidi, A. P., Prananto, I. W., Arifani, F., & Setyawati, R. (2022). Pengembangan Flipbook Interaktif untuk siswa kelas 5 sekolah dasar pada materi siklus air. *Jurnal Ilmiah Pendidikan Dasar*, *9*(2), 128.

https://doi.org/10.30659/pendas.9.2.128-141

Piaget, J. (1950). *The psychology of intelligence*. Routledge.

Rahman, A., et al. (2022). Urbanization's impact on local traditions. *Cultural Preservation Review*, *10*(2), 89–104.

Ramli, M. (2012). Media dan Teknlogi Pembelajaran. In *IAIN Antasari Press*. Antasari Press.

Rosalianisa, R., et al. (2023). Digital learning media in elementary education. *Pedagogia Journal*, *15*(2), 112–125.

Rosalianisa, R., Purwoko, B., Nurchayati, N., & Subrata, H. (2023). Manuscript Analysis of Children's Language Skills and Number Concepts through Technology in the Digital Era. *International Journal of Social Science and Education Research Studies*, *03*(01), 1–8. https://doi.org/10.55677/ijssers/v03i1y2023-01

Rustam, S. (2024). *Sejarah dan Perkembangan Kecamatan Rajeg*. Jakad Media Publishing.

Saputra, R., & Hidayat, A. (2023). Ketangerangan's cultural heritage. *Tangerang Cultural Studies*, *5*(1), 22–35.

Smith, L. T. (1999). *Decolonizing methodologies: Research and indigenous peoples*. Zed Books.

Sweller, J., van Merriënboer, J. J. G., & Paas, F. (2019). Cognitive architecture and instructional design: 20 years later. *Educational Psychology Review*, *31*(2), 261–292. https://doi.org/https://doi.org/10.1007/s10648-019-09465-5

Thiagarajan, S., Semmel, D., & Semmel, M. (1974). *Instructional development for training teachers of exceptional children: A sourcebook*. Indiana University.

Tomlinson, C. A. (2017). *How to differentiate instruction in academically diverse classrooms* (3rd ed.). ASCD.

UNESCO. (2021). *SDG 4.7: Education for sustainable development*. https://unesdoc.unesco.org/

Verrysaputro, E. A., & Subekti, P. A. (2023). Kontribusi Mata Pelajaran Muatan Lokal Bahasa Jawa Dalam Penerapan Kurikulum Merdeka. *Vilvatikta: Jurnal Pengembangan Bahasa Dan Sastra Daerah*, *1*(1), 22–31. https://doi.org/10.59698/vilvatikta.v1i1.5

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Wang, F., & Hannafin, M. J. (2005). Design-based research and technology-enhanced learning environments. *Educational Technology Research and Development*, *53*(4), 5-23.

Warschauer, M. (2003). *Technology and social inclusion: Rethinking the digital divide*. MIT Press.

Wibowo, E., et al. (2019). Interactive flipbook as a learning media innovation. *Journal of Educational Science and Technology*, *5*(2), 107–116.

Wibowo, M., Gustina, E., Ayu, S. M., & Sofiana, L. (2019). Digital Flipbook Media as a Media for Health Promotion in Youth: Research and Development. *International Journal of Educational Research Review*, *4*(1), 725–733. https://doi.org/10.24331/ijere.628717

Wineburg, S. (2001). *Historical thinking and other unnatural acts*. Temple University Press.