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Development and Feasibility of a Heyzine Flipbook–Based Tricaka E-Module for Grade VII Students' Javanese Script Writing Skills

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ABSTRACT

Learning to write Javanese script (hanacaraka) at the junior high school level remains challenging due to low student motivation and limited instructional media that support systematic writing practice. This study aimed to develop and examine the feasibility of a Heyzine Flipbook–based Tricaka e-module designed to support Grade VII students' Javanese script writing skills. The study employed a Research and Development (R&D) approach using the ADDIE model, which consists of analysis, design, development, implementation, and evaluation stages. Data were collected through observations, interviews, and questionnaires, including needs analysis, expert validation instruments, and user response questionnaires. The e-module was validated by a material expert and a media expert and subsequently implemented in a limited trial involving one Javanese language teacher and 32 Grade VII students at SMP Negeri 01 Juwana during the 2024/2025 academic year. Data were analyzed using descriptive statistics in the form of feasibility percentages. The results showed that the e-module achieved a feasibility score of 83.33% from the material expert and 85% from the media expert, both categorized as highly valid. User responses also indicated very high feasibility, with 95% from the teacher and 97.08% from the students. These findings suggest that the Tricaka e-module is feasible for use as a learning medium in Javanese script writing instruction. Further research is recommended to examine its effectiveness in improving students' writing performance through experimental designs with larger and more diverse samples.

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1. INTRODUCTION

Javanese script *(hanacaraka)* constitutes an important cultural and linguistic heritage that continues to be taught as part of local content subjects in Indonesian schools, particularly at the junior

high school level. Within the framework of the Independent Curriculum, learning Javanese script is expected not only to preserve cultural identity but also to develop students' literacy skills, including reading and writing abilities. However, in practice, learning to write Javanese script remains a challenging task for many students due to its complex orthographic system, unfamiliar characters, and specific writing rules that differ significantly from the Latin alphabet (Zein & Kurniati, 2022).

Several studies have reported that students often experience difficulties in memorizing Javanese characters, applying sandhangan (diacritical marks), using pasangan (conjunct forms), and understanding murda characters correctly (Kholiq & Sukoyo, 2023; Semesta, 2024). These difficulties are compounded by limited exposure to Javanese script in daily life, which reduces opportunities for authentic practice and reinforcement. As a result, students tend to perceive Javanese script writing as a difficult and less engaging learning task, leading to low motivation and suboptimal learning outcomes.

One of the key factors contributing to these challenges is the limited use of instructional media that support skill-based learning, particularly writing practice. In many schools, Javanese language instruction still relies heavily on printed textbooks and student worksheets (LKS), which are often text-dominated and provide minimal interactive features (Mulwanti et al., 2022). Such conventional materials may be adequate for delivering theoretical knowledge but are less effective in fostering active engagement and repeated practice, both of which are essential for developing writing skills. Consequently, students may struggle to internalize writing rules and apply them accurately in practice.

The rapid advancement of educational technology offers promising opportunities to address these instructional challenges. Technology integration in education has been widely recognized as a means to enhance student engagement, support diverse learning styles, and facilitate independent learning (Herawati & Muhtadi, 2018; Manzil et al., 2022). In particular, digital learning media allow teachers to present learning content in more dynamic and interactive formats, combining text, visuals, audio, and video elements. Such multimodal representations are considered effective in supporting students' understanding of complex concepts and procedural skills (Lin, 2023).

Among various forms of digital learning media, electronic modules (e-modules) have gained increasing attention in recent years. E-modules are systematically organized digital teaching materials designed to support independent and guided learning through structured content, multimedia integration, and interactive features (Widiana & Rosy, 2021). Previous research has demonstrated that e-modules can improve learning flexibility, enable self-paced learning, and increase students' motivation when compared to conventional printed materials (Afnita et al., 2023; Sa'diyah, 2021). These advantages make e-modules particularly suitable for skill-oriented learning, including writing instruction.

Flipbook-based e-modules represent a specific type of digital module that simulates the experience of reading a physical book while offering enhanced interactivity and visual appeal. Flipbook technology allows users to navigate content intuitively through page-flipping animations, hyperlinks, embedded videos, and interactive quizzes (Ramadhina & Pranata, 2022). Research has shown that flipbook-based learning media can increase students' interest and engagement, especially at the primary and secondary education levels (Rosmiati et al., 2024). Furthermore, flipbooks are relatively easy to access across devices, making them practical for classroom, blended, and independent learning contexts.

Several studies have explored the development of digital learning media for Javanese language instruction. For example, Widiyono and Aryanto (2021) developed a flipbook-based e-module for teaching unggah-ungguh basa Jawa (Javanese language etiquette) and reported positive responses from students. Similarly, Sari et al. (2021) developed an e-module for learning Javanese script at the elementary school level using the iSpring application. While these studies demonstrate the potential of digital media in Javanese language learning, most of them focus on general feasibility or reading-related competencies, with limited emphasis on writing skills at the junior high school level.

In addition, existing digital learning media for Javanese script instruction often rely on relatively static formats, such as PDF documents or presentation slides, which provide limited interactivity and practice opportunities (Aprilia, 2024). Although some studies have introduced interactive or multimedia elements, research that explicitly utilizes the Heyzine Flipbook platform as a basis for developing e-modules in Javanese script writing instruction remains scarce. Heyzine Flipbook offers features such as responsive design, multimedia embedding, and user-friendly navigation, which have the potential to enhance students' learning experiences and support repeated writing practice in a more engaging manner (Manzil et al., 2022).

Given these gaps, there is a need for research that focuses on the development of interactive, technology-based learning media specifically designed to support Javanese script writing skills at the junior high school level. Such media should be aligned with curriculum objectives, responsive to students' learning needs, and validated through systematic evaluation processes. Development research using established instructional design models, such as ADDIE, provides a structured framework to ensure that learning media are pedagogically sound, user-friendly, and relevant to classroom practice (Setiadi & Nurma Yuwita, 2020; Taher & Bentri, 2024).

Therefore, this study aims to develop and examine the feasibility of a Heyzine Flipbook–based Tricaka e-module designed to support Grade VII students' Javanese script writing skills. The feasibility of the developed e-module is evaluated through expert validation involving material and media experts, as well as user responses from teachers and students. By focusing on development and feasibility evaluation, this study seeks to contribute to the growing body of research on technology-enhanced learning media for local language instruction and to provide practical insights for educators seeking innovative approaches to teaching Javanese script writing in junior high schools.

2. METHODS

2.1 Research Design

This study employed a Research and Development (R&D) approach aimed at producing and validating an instructional product in the form of an electronic module. Development research focuses on designing, developing, and evaluating educational products through systematic procedures grounded in instructional design theory (Setiadi & Nurma Yuwita, 2020). To guide the development process, this study adopted the ADDIE instructional design model, which consists of five sequential stages: Analysis, Design, Development, Implementation, and Evaluation (Taher & Bentri, 2024). The ADDIE model was selected due to its structured yet flexible framework, which allows iterative refinement of learning media based on empirical feedback.

2.2 Development Procedure

At the analysis stage, a needs assessment was conducted to identify students' learning difficulties, learning preferences, and existing instructional practices related to Javanese script writing. Curriculum analysis was also carried out to ensure alignment between the developed e-module and the learning objectives stipulated in the Independent Curriculum. Data at this stage were obtained through classroom observations, interviews with Javanese language teachers, and student needs analysis questionnaires.

The design stage involved planning the structure and content of the Tricaka e-module (Trampil Hanacaraka). This stage included determining learning outcomes, organizing instructional materials, designing learning activities, and planning multimedia integration such as images, videos, exercises, and quizzes. A detailed module outline was developed to ensure coherence between content, activities, and assessment components.

During the development stage, the designed e-module was produced using the Canva application and converted into a digital flipbook format using the Heyzine Flipbook platform. At this stage, expert validation was conducted to assess the feasibility of the product. Validation involved two experts: a material expert and a media expert. The material expert evaluated content accuracy, language clarity, and presentation suitability, while the media expert assessed layout design, navigation, consistency, graphics, and usability. The validation results were used as the basis for revising and improving the e-module before implementation.

The implementation stage consisted of a limited-scale trial of the revised e-module to examine its feasibility from the users' perspective. The es-module was distributed to students through an online platform with assistance from the Javanese language teacher. At this stage, data were collected to capture teachers' and students' responses regarding the usability, clarity, attractiveness, and perceived usefulness of the e-module.

Finally, the evaluation stage focused on analyzing validation results and user feedback to identify strengths and areas requiring improvement. Revisions were made based on expert recommendations and user responses to ensure that the final product met feasibility standards as an instructional medium (Damara et al., 2021).

2.3 Research Setting and Participants

This study was conducted at SMP Negeri 01 Juwana, located in Juwana District, Pati Regency, during the 2024/2025 academic year. The population consisted of 320 Grade VII students. A random sampling technique was applied to select 32 students for the limited trial. In addition, one Javanese language teacher participated in providing user responses during the implementation stage.

2.4 Data Collection Techniques and Instruments

Data were collected using a combination of qualitative and quantitative methods. Qualitative data were obtained through interviews, observations, and open-ended feedback from teachers and students. Quantitative data were collected using structured questionnaires, including:

a. a student needs analysis questionnaire,
b. a product validation questionnaire for material and media experts, and
c. teacher and student response questionnaires.

All questionnaires employed a four-point Likert scale ranging from 1 (very poor) to 4 (very good) to measure feasibility and user perceptions.

2.5 Data Analysis

The collected data were analyzed using descriptive statistical techniques. Quantitative data from validation and response questionnaires were calculated to obtain mean scores and converted into percentage values to determine feasibility levels. These percentages were then interpreted according to predefined validity criteria to classify the e-module as very valid, valid, fairly valid, or invalid. Qualitative data from interviews and feedback were analyzed descriptively to support quantitative findings and provide insights for product refinement. This mixed-data approach enabled a comprehensive evaluation of the e-module's feasibility in terms of content quality, media design, and user acceptance.

Table 1. Product Assessment Score Criteria

Value	Criteria
4	Very good
3	Good
2	Less good
1	Very poor

(Sureni et al., 2023)

Assessment results from questionnaires that have been assessed by validators are calculated using the formula

$$NP = \frac{R}{SM} \times 100\%$$

Description
NP = Percentage value
R = Score value obtained
SM = Maximum score value
100% = Fixed number (percentage)

The score resulting from the calculation is the percentage value. Furthermore, it is categorised according to the percentage category of validity according to(Sureni et al., 2023) as follows.

Table 2. Criteria for validity

Score	Criteria for Level of Validity
81.25 < x < 100	Very Valid
62.50 < x < 81.25	Valid
43.75 < x < 62.50	Fairly Valid
25 < x < 43.75	Invalid

3. FINDINGS AND DISCUSSION

The results of the research conducted by researchers produced learning media in the form of Heyzine flipbook-based E-Modules on Javanese script material for Phase D VII class students. Working on this e-module took 3 months with revisions and validators. Researchers compiled e-modules using the Canva application containing Javanese script material and then uploaded to Heyzine Flipbook. The e-module that the researcher made can be accessed through a link which will later be distributed through the seventh-grade WhatsApp group. The e-module can be accessed via laptop / PC and mobile phone, or the device can be connected to the internet. Apart from using the e-module link, it can be accessed with a barcode displayed on the LCD. Learners can directly access the barcode scand in learning.

Figure 1. e-Module Barcode

Learners can now have access to use the electronic module for all their Javanese script needs, thanks to the researcher's development work. The steps of analysis, design, development, implementation, and evaluation.

3.1. Analysis

The development of the Tricaka e-module prototype is described by the ADDIE framework. In the first stage, namely, *analyse.* At the outset of this research, a sequence of tasks was performed, including the observation of the study site. In this case, the activities involved interviewing the school's curriculum and Javanese language subject teachers and distributing questionnaires directly via the Google Forms platform. The analysis results show that in SMP N 01 Juwana, the problem found is that the instructional media used by teachers is too monotonous and students experience boredom in learning, besides that, learning is still dominantly using textbooks. Javanese language learning regarding Javanese script material provided to students to be executed using limited media. This will make it arduous for students to learn activities. In addition, researchers have also carried out theoretical investigations using various references, including related electronic books, primarily in the context of utilizing digital modules as learning tools.

In this step, the researcher analyzes the characteristics of students as the foundation for creating the proper module. The electronic module developed is hoped for to be optimize student learning results by taking their needs into account(Zahro & Aprilia, 2024) .From the data acquired through observations and interviews with seventh-grade students, a number of impprtant information was obtained. It turns out that students are more interested in using learning media, students are also motivated if learning does not only focus on textbooks, student worksheets (LKS), and printed modules. In this regard, they feel helped in understanding the material with an interesting and interactive digital module. The results of the questionnaire distribution can be seen in the following table.

Table 3. Recapitulation of Student Needs Analysis Results

Students are interested in learning Javanese script.	39.3%
Students' difficulty in understanding Javanese script material.	57.1%
Students' difficulties in writing Javanese script	50%
Students do not get enough help when having difficulty learning Javanese script.	35.7%
The use of digital learning media can help students master Javanese script.	50%
Students want Tricaka E-module media in making it easier to understand Javanese script.	64.3%
Students need the Tricaka E-module to clarify the concept of Javanese script writing rules.	67.9%

3.2. Design

Second is the planning stage (Design), which is the stage of designing the Tricaka e-module. The design of this product is based on struggles faced in learning write Javanese script obtained from the results of teacher interviews and distributing student questionnaires. Researchers designed electronic modules starting from determining Learning Outcomes (CP), Learning Objectives (TP) then compiled this e-module design through a terms of reference which included: 1) Cover page, 2) foreword, 3) table of contens, 4) instructions for using the module, 5) material coverage, 6) learning videos, 7) *Gladhen*, 8) quiz, 9) summary, 10) bibliography, and 11) author profile. The researcher continued the design design using the Canva Pro application, with the results of the completion converted in Hezine Flipbooks.

Figure 2. Tricaka e-module cover

The homepage of the developed Tricaka e-module combines 2 types of colours. The brown colour was chosen because it is synonymous with Javanese cultural symbols.(Muhadiyatiningsih & Fathonah, 2020) . The front part has a title, a picture of Javanese attributes, as well as the identity and author. An image of a puppet and Javanese script were chosen as the cover design because it is one of the iconic forms of Javanese culture.(Siswantari, 2021)

Figure 3. Table of contents view

Figure 4. Display of Javanese script material

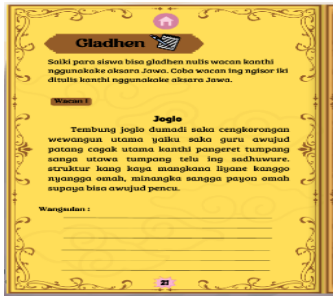

Figure 5. Display of tricaka e-module gladhen

Figure 6. Tricaka e-module quiz display

Users can navigate the e-module by selecting the desired content through the table of contents, where each subchapter is hyperlinked and directs users automatically to the corresponding section. A home navigation button is provided on each page, allowing users to return to the main menu without the need to scroll through pages sequentially. The learning materials presented in the e-module are supported by illustrative images and embedded instructional videos to facilitate students' understanding of Javanese script writing. At the end of the e-module, practice tasks (*gladhen*) and quizzes are provided to reinforce learning and assess students' comprehension of the material. The quizzes consist of 20 multiple-choice questions developed using the Wordwall platform and are designed to measure the achievement of learning objectives related to Javanese script writing skills.

3.3. Development

Before the e-module can be trialled with students, it is first validated by experts. Product validation is conducted to determine the viability of the Trampil Hanacaraka (*tricaka*) e-module to be implemented. The researchers provided a questionnaire using 1-4 rating scale. The validation questionnaire contains statements regarding the Tricaka that has been for expert evaluation. The experts who are validators for this product are material experts, and media experts. Material expert validation aims to rate the properness of the material presented in the E-Module. Media expert validation aims to rate the appropriateness of the media presented in the E-Module.

Table 4. Expert Validation Results

	Validator	**Average percentage score**	**Category**
1	Material Expert	83.33 %	Very Valid (81.25-100)
2	Media Expert	85 %	Very Valid (81.25- 100)
	Average	84.16	Very Valid (81.25 - 100)

3.3.1. Material Expert

Rahma Ari Widihastuti, S.Pd., MA, a lecturer in the Department of Javanese Language and Literature at Semarang State University, conducted the material expert validation test related to the Tricaka e-module. The material expert assessment of the *Tricaka* e-module consists of 24 indicators which are divided into 3 aspects, namely aspects of content feasibility (11 indicators), aspects of language feasibility (6 indicators), and aspects of presentation feasibility (7 indicators). The outcomes of the validation showed that the content feasibility aspect with 5 indicators, scored 3 and 6 indicators scored 4. The language feasibility aspect with 4 indicators, scored 3 and 2 indicators scored 2. The presentation feasibility aspect, with 3 indicators scored 3, and 4 indicators scored 4.

3.3.2. Media Expert

The media validation of the Tricaka (*Trampil Hanacaraka*) e-module was conducted by Dr. Nur Hanifah Insani, M.Pd., a lecturer in the Department of Javanese Language and Literature at Semarang State University. The media evaluation instrument consisted of 20 indicators grouped into five assessment aspects: screen design appearance (5 indicators), user-friendliness (4 indicators), consistency and feasibility (3 indicators), graphic quality (4 indicators), and usefulness (4 indicators). The validation results indicated that, in the screen design aspect, two indicators received a score of 3 and three indicators received a score of 4. For user-friendliness, two indicators were rated 3 and the remaining two indicators were rated 4. All three indicators in the consistency and feasibility aspect received a score of 3. In the graphic quality aspect, three indicators were rated 3 and one indicator was rated 4. Finally, in the usefulness aspect, two indicators received a score of 3 and two indicators received a score of 4.

3.4 Implementation

The fourth stage is a product that has been validated and is feasible to be tested according by experts based on the results of subsequent assessments, can be tested on e-modules for VII grade students of SMP N 01 Juwana. Product trials have the aim of knowing student assessments related to teaching materials developed(Wijayanti & Sulistiyono, 2024) . E-Modules are distributed through a WhatsApp group with the help of Javanese language subject teachers. Assessment of students is limited only to student responses and responses as e-module users. The distribution of student assessment questionnaires was carried out directly through Google Form. The total number of students who became respondents was 32 students. Based on the results of the product trial, a varied score was obtained from the students' responses. From the total score, the average percentage obtained is 97.08% with a very valid interval. Furthermore, based on the results of the teacher's response to the Trampil Hanacaraka (*tricaka*) E-Module developed, a percentage of 95% was obtained with a very valid interval.

Table 5. Results of teacher and student respondents

	Respondents	Average percentage score	Category
1	Teacher	95 %	Very Valid (81.25-100)
2	Students	97.08%	Very Valid (81.25- 100)
	Average	96.04%	Very Valid (81.25 - 100)

3.5 Evaluation

The presentation of research results in the previous four stages is followed by the evaluation stage. The evaluation included material experts, media evaluators, teachers, and students. This process aims to analyse the flexibility of the developed learning media, especially the Heyzine flipbooks-based skilled hancaraka e-module. The emergence of deficiencies found encouraged researchers to revise according to the directions and recommendations of experts immediately. The ultimate goal is to ensur researchers can determine the success of of the extent to which the media developed is in accordance with the learning used.

Discussion

The development of the Tricaka e-module using the ADDIE framework demonstrates that a systematic instructional design process plays a critical role in producing feasible and user-acceptable digital learning media. The analysis stage enabled the identification of key learning problems faced by Grade VII students, particularly low motivation and difficulties in mastering Javanese script writing

rules. This finding supports previous studies indicating that needs analysis is a crucial foundation for designing instructional media that are relevant to learners' cognitive and contextual characteristics (Setiadi & Nurma Yuwita, 2020). By grounding the module design in actual classroom conditions, the Tricaka e-module was able to address specific instructional gaps rather than offering a generic digital solution.

From a design perspective, the use of Canva as a development tool and Heyzine Flipbook as a delivery platform contributed to the visual clarity and navigational flexibility of the e-module. The analytical implication of this finding lies in the role of visual organization and cultural representation in learning media. The incorporation of Javanese cultural elements—such as traditional color schemes and symbolic illustrations—served not merely as aesthetic features but as contextual cues that may support learners' cultural engagement. This aligns with Mariska and Rahmatina (2022), who argue that visually appealing and culturally contextualized digital materials can enhance students' attention and learning readiness. Thus, the design choices in the Tricaka e-module can be interpreted as pedagogically meaningful rather than purely decorative.

The high feasibility scores obtained from expert validation indicate that the e-module met essential standards of content accuracy, media usability, and instructional presentation. The overall validation score of 84.16% places the product in the "highly valid" category, suggesting that the e-module is appropriate for classroom use with minor revisions. However, analytically, expert feedback—particularly regarding aspects of material presentation—signals that feasibility does not equate to perfection. As emphasized by Dewi and Insani (2024), validation results should be interpreted as a basis for refinement rather than as final confirmation of instructional quality. Therefore, the validation outcomes in this study highlight the importance of iterative improvement in development research.

User responses from both teachers and students further strengthen the feasibility findings. The very high response percentages (teacher: 95%; students: 97.08%) suggest strong acceptance and perceived usefulness of the e-module. Analytically, these results reflect users' positive perceptions of usability, clarity, and engagement rather than direct evidence of learning improvement. Similar findings have been reported in previous studies, where high user response scores indicate that digital modules are well-received and practically applicable in learning contexts (Widiana & Rosy, 2021; Fitri et al., 2023). However, it is important to note that positive perceptions do not automatically translate into improved learning outcomes, particularly in skill-based domains such as writing.

The inclusion of interactive elements—such as embedded videos, practice tasks (gladhen), and quizzes—appears to play a central role in shaping users' positive responses. These features support active engagement and provide opportunities for repeated practice and self-assessment, which are essential components of effective writing instruction. This finding is consistent with Sari et al. (2021), who found that interactive e-modules facilitate independent learning and allow students to control their learning pace. Moreover, the availability of quizzes with immediate feedback aligns with the argument that digital modules can enhance formative assessment by enabling learners to identify and correct errors promptly (Agusminarti et al., 2024).

Despite these positive implications, several limitations must be critically acknowledged. First, the small sample size and single-school setting limit the generalizability of the findings. The feasibility results reflect localized conditions and may differ in schools with varying technological infrastructure or student characteristics. Second, this study focused exclusively on feasibility and user responses, without examining the effectiveness of the e-module in improving students' actual writing performance. As noted by Sa'diyah (2021), feasibility studies represent an important preliminary step, but they must be followed by experimental research to establish instructional impact. Additionally, differences in students' digital literacy levels may influence how effectively they engage with e-modules, potentially creating disparities in learning experiences.

From an educational practice perspective, the findings of this study suggest that flipbook-based e-modules can function as complementary learning resources that enrich conventional instruction rather than replace it. The Tricaka e-module demonstrates how technology-based materials can support local

language learning by providing flexible, visually engaging, and culturally relevant resources. This supports the argument by Anggriani et al. (2024) that digital modules can enhance instructional balance when integrated thoughtfully into classroom practice.

Finally, the development process and validation outcomes underscore the importance of adopting systematic design and evaluation models in educational media development. By involving experts and users at multiple stages, developers can ensure that learning media meet pedagogical, technical, and practical standards. As highlighted by Delita et al. (2024), such systematic approaches increase the likelihood that educational products will be both usable and sustainable in real learning environments. Future research should extend this work by examining learning effectiveness, exploring adaptive features for diverse learners, and testing scalability across different educational contexts (Gunawan et al., 2024).

4. CONCLUSION

This research and development study resulted in the successful production of a Heyzine Flipbook–based Tricaka e-module for Grade VII Javanese script learning, developed using the ADDIE model and grounded in students' learning needs and technological considerations. The validation results indicate that the e-module meets feasibility standards as a learning medium, as evidenced by high scores from the material expert (83.33%) and media expert (85%), while student responses reflected very positive perceptions in terms of usability, attractiveness, and instructional support (97.08%). These findings suggest that the Tricaka e-module is appropriate for use as a supplementary learning resource in Javanese script instruction. Nevertheless, this study was limited to a single school and a relatively small sample size, and it focused primarily on feasibility rather than learning effectiveness. Therefore, future research is recommended to involve larger and more diverse samples, examine the effectiveness of the e-module in improving students' writing performance through experimental designs, and further refine interactive features to better accommodate varying learner characteristics and promote deeper student engagement.

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