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Development of Interactive E-Module Based on Heyzine Flipbook to Enhance Student Creativity in Basic Culinary Subjects

Ermy Rizky Barokah¹⁾, Elida Elida²⁾✉, Kasmita Kasmita³⁾, Elfi Tasrif⁴⁾

¹⁾ Postgraduate Program Of The Faculty Of Engineering, Universitas Negeri Padang, Padang, Indonesia

E-mail: ermyrb@gmail.com

✉²⁾ Department of Family Welfare Sciences, Universitas Negeri Padang, Padang, Indonesia

E-mail: 11111961@fpp.unp.ac.id

³⁾ Department of Tourism, Universitas Negeri Padang, Padang, Indonesia

E-mail: kasmita70@fpp.unp.ac.id

⁴⁾ Department of Electronics Engineering, Universitas Negeri Padang, Padang, Indonesia

E-mail: elfitasrif@ft.unp.ac.id

✉ Correspondence Author

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Abstract

This study addresses the low level of creativity among students in designing menus in the *Culinary Basics* subject at SMK Negeri 3 Kota Solok. Observations revealed that students' menu designs were monotonous, lacked innovation, and did not meet the Criteria for Achievement of Learning Objectives, due to limited teaching materials, conventional methods, and the absence of interactive media. The research aimed to develop an interactive e-module based on Heyzine Flipbook to improve students' creativity in menu design. This Research and Development (R&D) study adopted the 4D development model (Define, Design, Develop, Disseminate) with Grade 10 Culinary Skills students as subjects. Product validity was assessed by material and media experts, practicality by teachers and students via questionnaires, and effectiveness by evaluating students' creative products on novelty, problem-solving, and elaboration. Results showed the e-module to be valid (material expert score 0.92, media expert score 0.888), highly practical (teacher score 0.97, student score 0.89), and effective. The experimental class achieved a creativity score of 94.44 (highly effective) compared to the control class's 63.80 (less effective). These findings confirm the e-module's suitability as an engaging, effective learning medium supporting the implementation of the independent curriculum in vocational education.

INTRODUCTION

Culinary education, particularly in vocational high schools, plays a vital role in equipping students with practical skills, creativity, and innovation to meet industry demands (Auliya et al., 2024; Herlinawati & Octavia, 2025). In the *Culinary Basics* subject, creativity is essential in designing menus that are not only functional but also appealing in terms of taste, presentation, and

innovation. According to recent educational research, creativity in vocational learning fosters problem-solving skills, adaptability, and competitive advantage in the culinary field (Nurhayati et al., 2025; Yanti et al., 2025). However, teaching creativity requires not only skilled instructors but also learning media that stimulate students' imagination and encourage exploration.

The development of digital learning media has emerged as a transformative approach to address limitations in conventional teaching. Studies have shown that e-modules, when designed interactively, can significantly improve student engagement and learning outcomes (Doyan et al., 2024; Wardah & Andriani, 2025). Platforms such as Heyzine Flipbook allow for the integration of multimedia elements text, images, animations, and interactive links that enhance the presentation of instructional content. These technological advancements have been successfully applied in various subjects, including science and vocational training, yet their application in culinary education remains limited (Ishak et al., 2025; Riwayani et al., 2024).

Observations in SMK Negeri 3 Kota Solok revealed that students' menu designs tend to be monotonous, lack innovation, and often fail to meet the *Criteria for Achievement of Learning Objectives* (KKTP). Contributing factors include limited availability of updated teaching materials, the use of teacher-centered instructional methods, and the absence of media that actively engages students in creative learning tasks. Although some studies have explored the integration of digital learning media in vocational education, most focus on technical skills acquisition rather than fostering creativity in culinary menu design (Tullah et al., 2025; Wulandari & Nurharini, 2023).

This research addresses this gap by focusing on the development of an interactive e-module specifically tailored for the *Culinary Basics* subject, targeting the enhancement of creativity in menu design. Unlike prior works that emphasize static digital resources, this study integrates multimedia-rich, interactive components through the Heyzine Flipbook platform. Such a design is intended not only to deliver content effectively but also to provide problem-solving scenarios, creative challenges, and visual inspirations to encourage originality among students (Asiah et al., 2025; Hastuti et al., 2024).

The novelty of this research lies in its combined approach: employing the 4D development model to ensure systematic design and validation, utilizing Heyzine Flipbook for interactive delivery, and embedding creativity-oriented learning tasks aligned with the *Merdeka Curriculum*. By merging technological innovation with pedagogical strategies, the study seeks to bridge the gap between theoretical learning and real-world culinary creativity. This approach has the potential to be replicated in other vocational subjects that require high levels of innovation and problem-solving.

Therefore, the primary aim of this study is to develop and evaluate an interactive e-module based on Heyzine Flipbook that meets the criteria of validity, practicality, and effectiveness in improving students' creativity in menu design. Through expert validation, teacher and student practicality testing, and experimental evaluation, this research contributes both to the theoretical discourse on digital learning media and to the practical advancement of culinary education in vocational schools (Agustin et al., 2025).

METHODS

This study employed a Research and Development (R&D) approach using the 4D model, which consists of four stages: Define, Design, Develop, and Disseminate. The Define stage involved identifying the problem through classroom observations and needs analysis, which

revealed low levels of student creativity in menu design due to limited learning resources and conventional teaching methods. The Design stage focused on creating the structure, content, and interactive features of the e-module, integrating text, images, and multimedia elements in the Heyzine Flipbook platform to enhance engagement and creativity. The Develop stage included expert validation by material and media specialists to ensure content accuracy, relevance, and usability, followed by revisions based on feedback. Finally, the Disseminate stage involved implementing the validated e-module in classroom settings for practical testing.

The research subjects were Grade X students of the Culinary Arts Program at SMK Negeri 3 Kota Solok. Data were collected through expert validation sheets, practicality questionnaires for teachers and students, and creativity assessment rubrics. Product validity was measured using validation scores from material and media experts. Practicality was evaluated based on teacher and student responses regarding ease of use, relevance, and engagement. Effectiveness was determined by comparing the creativity scores of students in the experimental class, who used the e-module, with those in the control class, who received conventional instruction. Creativity was assessed across three indicators: novelty, problem-solving ability, and elaboration in menu design tasks.

RESULT AND DISCUSSION

The development and implementation of the interactive e-module based on Heyzine Flipbook were assessed in terms of validity, practicality, and effectiveness. The following subsections present the findings in detail.

Table 1. Validation Results of the Heyzine Flipbook-Based E-Module

Validator Type	Validation Score	Category
Material Expert	0.92	Valid
Media Expert	0.888	Valid

The validation process involved two types of experts: material and media. The material expert focused on the accuracy, completeness, and relevance of the culinary content, while the media expert assessed the design, interactivity, and technical features of the Heyzine Flipbook format. The material expert provided a score of 0.92, while the media expert provided a score of 0.888. Both scores fall under the "valid" category, indicating that the developed e-module met academic and media quality standards before implementation.

Table 2. Practicality Test Results of the Heyzine Flipbook-Based E-Module

Respondent Type	Practicality Score	Category
Teacher	0.97	Very Practical
Students	0.89	Very Practical

The practicality assessment was conducted through questionnaires distributed to both the subject teacher and participating students. Teachers gave a score of 0.97, suggesting that the e-module is easy to integrate into the learning process, with user-friendly navigation and adaptable learning features. Students rated it 0.89, indicating that they found the e-module highly engaging, interactive, and easy to understand. Both results are in the "very practical" category, showing that the e-module is well-suited for classroom use.

Table 3. Effectiveness Test Results Based on Student Creativity Scores

Class Type	Average Creativity Score	Effectiveness Category
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Experimental	94.44	Very Effective
Control	63.80	Less Effective

The effectiveness test compared the creativity scores of students between the experimental class (using the developed e-module) and the control class (using conventional learning methods). The experimental class achieved an average score of 94.44, categorized as "very effective", indicating a significant improvement in creativity, particularly in novelty, problem-solving, and elaboration. Meanwhile, the control class only reached 63.80, which falls into the "less effective" category. This confirms that the Heyzine Flipbook-based e-module substantially enhances students' creative skills in menu design.

Discussion

The results of this study demonstrate that the interactive e-module based on Heyzine Flipbook meets the validity standards required for effective learning materials in vocational education. The material expert's score of 0.92 and the media expert's score of 0.888 indicate that both the content and the technological design align with pedagogical principles and curriculum requirements for the subject *Basic Culinary*. These findings are consistent with previous research indicating that learning resources with high content accuracy and an engaging format can enhance student engagement and comprehension in practical-based subjects (Jannah, 2023; Rida et al., 2025).

From the practicality perspective, the high scores given by both teachers (0.97) and students (0.89) suggest that the e-module is user-friendly and adaptable to classroom conditions. Teachers reported that the module's structure and interface facilitated lesson delivery, reduced preparation time, and supported differentiated learning approaches. Students, on the other hand, appreciated the interactive features, visual presentation, and ease of navigation offered by the Heyzine Flipbook format. These findings reinforce the idea that practicality in digital learning tools not only improves teacher efficiency but also enhances student motivation and participation (Kharomah et al., 2024; Muhaimin et al., 2024).

The effectiveness results provide strong evidence of the e-module's capacity to improve students' creativity in menu design. The experimental class achieved a creativity score of 94.44, classified as "very effective," while the control class, using conventional learning methods, achieved only 63.80, falling under the "less effective" category. This significant gap can be attributed to the e-module's emphasis on stimulating creative thinking through multimedia elements, problem-based learning scenarios, and real-world culinary design tasks. Such an approach aligns with constructivist learning theories that emphasize active engagement and authentic task completion (Yuni et al., 2025).

Moreover, the improvement in creativity observed in the experimental class covers essential dimensions such as novelty, problem-solving, and elaboration. The interactive format allowed students to explore diverse menu concepts, experiment with presentation styles, and refine their designs through iterative feedback. This process mirrors the professional culinary environment, where creativity and innovation are critical skills. These findings align with prior studies that suggest digital modules with interactive capabilities can bridge the gap between theoretical knowledge and practical application in vocational education (Irma et al., 2024).

Overall, the integration of the Heyzine Flipbook-based e-module into the *Basic Culinary* subject supports the goals of the *Merdeka Curriculum*, which emphasizes independent and creative learning. By addressing limitations in traditional teaching methods and providing a dynamic,

accessible, and engaging learning resource, the developed e-module proves to be a valuable instructional innovation. These results not only validate the module's design but also highlight its potential to be adapted for other vocational subjects requiring creativity and practical skill development (Fadila et al., 2025).

CONCLUSIONS

The development of an interactive e-module based on Heyzine Flipbook for the *Culinary Basics* subject at SMK Negeri 3 Kota Solok has proven to be valid, practical, and effective in enhancing students' creativity in menu design. Expert validation results confirmed that the e-module meets high standards of content accuracy and media quality, while practicality tests from teachers and students indicated that it is user-friendly, engaging, and easily integrated into classroom learning. The experimental implementation demonstrated a significant improvement in students' creativity particularly in novelty, problem-solving, and elaboration compared to conventional teaching methods. These findings indicate that the developed e-module successfully addresses the lack of innovative and interactive learning resources, aligns with the objectives of the *Merdeka Curriculum*, and offers a valuable pedagogical tool that can be adapted for other vocational education contexts requiring creativity and innovation.

CONFLICTS OF INTEREST STATEMENT

Regarding this study, the author declares that there is no conflict of interest.

AUTHOR CONTRIBUTIONS

Study concept and design: Ermy Rizky Barokah. Acquisition of data: Elida Elida. Analysis and interpretation of data: Kasmita Kasmita. Drafting the manuscript: Ermy Rizky Barokah. Critical revision of the manuscript for important intellectual content: Elfi Tasrif. Statistical analysis: Ermy Rizky Barokah.

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