Development of Digital Comic Learning Media for Soup and Soto Processing Materials for Culinary Vocational Students

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ABSTRACT

The objective of this study is to develop digital comic-based learning media for the subject of Indonesian Soup and Soto Processing for 11th-grade Culinary Vocational High School students and to assess its feasibility. This research employs the Research and Development (R&D) methodology with the 4D model: Define, Design, Develop, and Disseminate, conducted at SMKN 4 Yogyakarta. Data collection methods include observation, interviews, and questionnaires. Data analysis is carried out using descriptive statistics. The developed digital comic media features an A5 size (21cm x 14.8cm) with a total of 29 pages, consisting of 1 cover page, 2 introductory pages, 24 content pages, 1 character page, and 1 conclusion page, covering the topics of soup and soto processing and presentation, including definitions, classification, characteristics, composition, criteria for results, processing techniques, and presentation techniques. The feasibility of the digital comic media was validated by both media and material validators, and the trial results from 11th-grade Culinary students at SMKN 4 Yogyakarta showed that 88% rated it as highly feasible and 12% rated it as feasible.

INTRODUCTION

Education is an essential process for the development and maturation of individuals, as it involves changing attitudes and behaviors to foster growth (Waridah, 2017). Traditionally, education has been conducted through face-to-face interactions, but with advancements in technology, online learning has become increasingly prevalent. This shift necessitates innovative teaching methods to ensure effective delivery of educational content, whether in traditional or online settings (Budiyono, 2020). As educators, leveraging technological advancements to create engaging and effective learning media is crucial.

Learning media encompass various forms, including print, exhibition, audio, visual, multimedia, and networked computers (Yaumi, 2017). Visual media, in particular, offer realistic and comprehensible

depictions of materials, enhancing student understanding. Among these, comics and cartoons are valuable visual aids. Digital comics, aligned with the Industrial Revolution 4.0, provide a modern approach to visual storytelling that is easily accessible and engaging through applications or websites (Darmayanti, 2021). Their engaging format and clear illustrations can significantly enhance student interest and comprehension (Nugraheni et al., 2017).

At SMK N 4 Yogyakarta, a vocational high school specializing in culinary arts, the teaching of Indonesian food processing relies heavily on traditional methods such as lectures and PowerPoint presentations. This approach has resulted in reduced student interest and suboptimal learning outcomes. Specifically, in the subject of Indonesian Soups and Soto processing, a significant portion of students has scored below the minimum passing mark, indicating a need for more effective teaching methods.

To address this issue, it is proposed that digital comic learning media be developed and utilized. Digital comics can transform the delivery of educational content, making it more engaging and accessible for students. By incorporating clear visualizations and concise explanations, digital comics can facilitate a better understanding of complex culinary processes, thereby improving student performance and interest in the subject.

Research has shown that digital comics can significantly enhance learning experiences across various educational settings. For instance, the VARK model, which addresses different learning styles (visual, auditory, read/write, and kinesthetic), demonstrates that digital comics can cater to diverse student needs, making learning more inclusive and effective (Sutin et al., 2022). This model's application to vocational education, particularly in culinary arts, holds promise for improving student engagement and comprehension.

In vocational schools, digital comic learning media have been effectively developed using the ADDIE method, which involves analysis, design, development, implementation, and evaluation. This systematic approach ensures that the content is well-structured and aligned with learning objectives, leading to positive student responses and improved learning outcomes (Firdiana et al., 2021). Furthermore, studies comparing digital comics to other learning media, such as e-books, have found that digital comics are particularly effective in enhancing student engagement and understanding (Trimurtini et al., 2021).

Additional research highlights the broader applicability of digital comics in education. For example, mind mapping-based comics have been used to improve creative thinking and learning outcomes in subjects like mathematics (Andryani & Wibawa, 2021). This suggests that visual storytelling, as employed in digital comics, can stimulate creativity and critical thinking, which are essential skills in vocational education. These findings underscore the potential of digital comics to revolutionize teaching and learning practices in culinary education.

Despite the demonstrated benefits of digital comics in various educational contexts, there is limited research on their application in culinary vocational education, particularly for subjects like Indonesian Soups and Soto processing. While studies have validated the effectiveness of digital comics in improving engagement and comprehension, their use in culinary schools remains underexplored. This gap presents an opportunity to investigate the specific impact of digital comics on culinary students' learning experiences and outcomes.

Moreover, the integration of cultural elements in educational content has shown to enhance learning experiences. However, there is a lack of studies exploring the incorporation of Indonesian culinary culture into digital comics for educational purposes. This gap highlights the need for research that not only evaluates the effectiveness of digital comics but also considers the cultural relevance and context of the learning material.

Lastly, existing studies primarily focus on the development and validation of digital comics for theoretical subjects. There is a need for research that examines the practical application of digital comics in

hands-on subjects like culinary arts, where students must understand both theory and practice. Addressing these gaps can provide valuable insights into the potential of digital comics to enhance vocational education.

The novelty of this study lies in its focus on applying digital comics to culinary vocational education, specifically for Indonesian food processing materials. By integrating cultural elements and addressing both theoretical and practical aspects of the subject, this study aims to fill the existing research gaps and provide a comprehensive solution to improve learning outcomes. The scope of the study includes the development of digital comics, their implementation in the classroom, and the assessment of their impact on student engagement, understanding, and performance in Indonesian Soup and Soto Processing.

PURPOSE OF THE STUDY

The purpose of this study is to develop digital comic-based learning media for the subject of Indonesian Soup and Soto Processing for 11th-grade Culinary Vocational High School students at SMK N 4 Yogyakarta and to evaluate its feasibility. This study aims to enhance student engagement and improve their understanding and performance in the subject by utilizing clear visualizations and concise explanations through easily accessible digital comics.

METHOD

This study employs a Research and Development (R&D) approach, which is a research method used to produce specific products and test their effectiveness (Sugiyono, 2018). The R&D process follows the 4D procedure: Define, Design, Develop, and Disseminate. The research was conducted at SMK N 4 Yogyakarta in June 2023. The research procedure consists of four stages:

1. Define Stage: This stage involves several activities such as classroom observations, interviews, and documentation.
2. Design Stage: This stage involves preparing the initial design by classifying the material, creating the storyline, revising, and developing the media.
3. Develop Stage: This stage includes the development phase consisting of expert validation of the content, expert validation of the media, limited trials, and large-scale trials.
4. Disseminate Stage: This stage involves disseminating the teaching materials to educators and students by uploading the media to a website and creating a QR code.

Participants

The population for this study consists of all 11th-grade students at SMK N 4 Yogyakarta, divided into three classes. From this population, a small-scale trial sample of 10 students was selected using simple random sampling. A large-scale trial (media feasibility test) was conducted with 36 11th-grade students. Additionally, one subject matter expert, one media expert, and one PPMI subject teacher served as validators for the digital comic media on Indonesian soups and soto.

Data Collection and Analysis

Data for the creation of the digital comic on Indonesian soups and soto were obtained from observations, interviews, and the syllabus and lesson plans (RPP) for the subject of soup and soto processing and presentation. The instruments used for data collection in this research include observation sheets, interview guides, and questionnaires (Arikunto, 2013). The media feasibility instruments from media and content experts consist of 40 items, while the student media feasibility instrument consists of 30 items, using a Likert scale of 1-4: 1) Very unfeasible; 2) Unfeasible; 3) Feasible; 4) Very feasible (Sugiyono, 2018). The data analysis technique used in this research is descriptive statistics (Sugiyono, 2018).

FINDINGS

Development Process of the Indonesian Soup and Soto Comic Media

The development of the comic media was carried out in four stages: Define, Design, Develop, and Disseminate.

Define Stage

The Define stage involved classroom observations and interviews. The observations in the 11th-grade Culinary classes 5 and 6 at SMKN 4 Yogyakarta revealed that the teaching methods were still traditional, primarily lectures using PowerPoint presentations, where the teacher provided the material, and students took notes. Eight students expressed boredom during the lessons, indicating that the method did not engage their interest in learning. During practical sessions, students still struggled to understand the procedures for preparing soups and soto, resulting in a lack of comprehension of the material.

Subsequently, interviews were conducted with the PPMI teacher at SMKN 4 Yogyakarta. The interview results showed that teachers found it challenging to make students understand and focus during lessons. The teachers' limited ability to create engaging media meant they primarily used PowerPoint presentations. Students indicated more interest when lessons included attractive visual media.

An analysis of learning components was conducted by collecting the 2013 curriculum syllabus and relevant lesson plans (RPP) for the subject of Indonesian soup and soto presentation. To improve student understanding and maintain focus, an engaging medium like a comic with soup and soto content was deemed necessary.

Design Stage

The Design stage involves the creation of the comic media. The first step is to design the storyline, aligned with KD 3.14 and 4.14, which analyze and prepare Indonesian soups and soto. The content includes definitions, classifications, compositions, processing techniques, presentation techniques, and criteria for Indonesian soups and soto. The second step involves designing the comic characters, Andi and Rina, as illustrated in Figure 1.

Figure 1. Andi and Rina's characters

The next step is to draft the script. The script contains the dialogue for the Indonesian soup and soto comic, adjusted based on the PPMI material for processing and presenting soups and soto, in accordance with the curriculum standards. The script development process includes the initial script, first revision, final script, cover, introduction, content, character profiles, and conclusion.

Develop Stage

The third and final stage is finishing, where final touches are added to the comic, such as shading and various effects. In this stage, the product is created according to the design plans. The comic consists of 29 pages: 1 cover page, 2 introduction pages, 24 comic pages, 1 character profile page, and 1 conclusion page. The comic then undergoes validation by media and content experts. Feedback from these experts is used to improve the comic media. A small-scale trial is conducted with 10 students from the 11th grade at SMK N 4 Yogyakarta, followed by a large-scale trial with 33 students from the 11th-grade Culinary class 5 at SMK N 4 Yogyakarta.

Disseminate Stage

After the trials, with 88% rating the media as highly feasible, the digital comic is made accessible to the public by uploading it to the Universitas Negeri Yogyakarta website and generating a QR code (Figure 2) for the comic on Indonesian soup and soto processing.

Figure 2. QR Code Digital Comic Soup Processing and Indonesian Soto

Media Feasibility Test Results

Content Validator Results

The content validator recommended adding images to the classification table of Indonesian soto as shown in Figure 3 (a). Additionally, they suggested including characteristics and criteria for Indonesian soups and soto to align with the competency indicators. Figure 3 (b) presents the additional material to match the competency indicators.
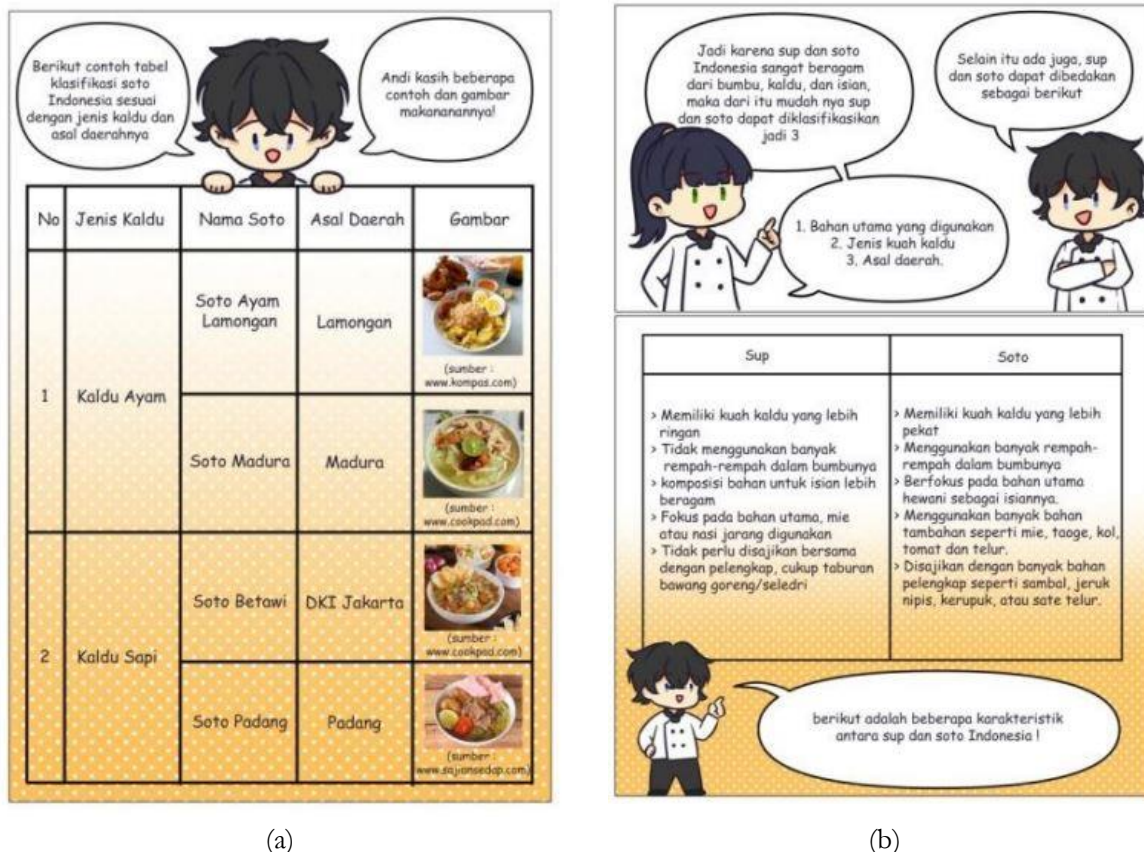

(a)   (b)

Figure 3. Screenshot of Material Includes: (a) Image After Revision of the Soto Classification Table, (b) Additional Material to Adapt Competencies

Media Validator Results

The media validator suggested that the comic story on Indonesian soup and soto include more recipe diversity beyond just chicken soto, adding two more types: Soto Betawi and Soto Ikan Cakalang, as shown in Figure 4. The introduction and conclusion regarding learning objectives were also added.
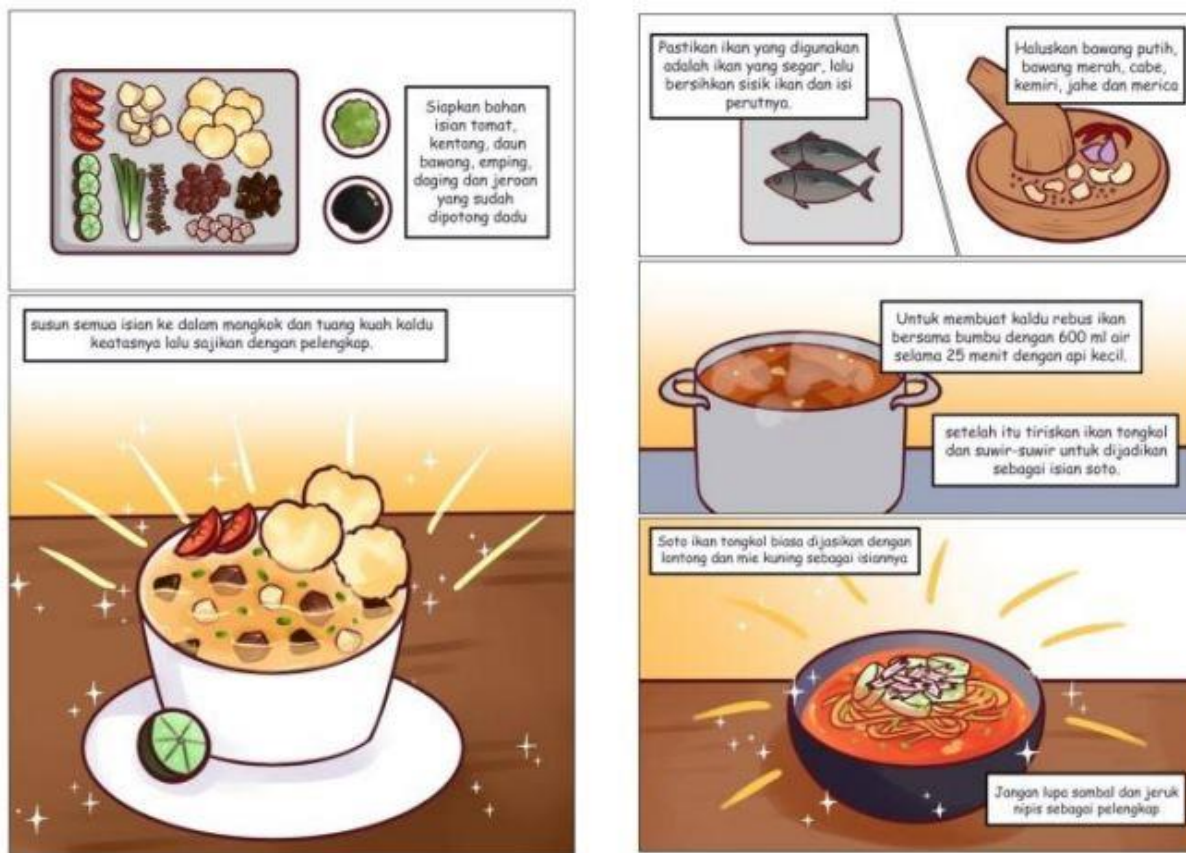

Figure 4. Screenshot of The Content of Soto Betawi Dishes and Soto Ikan Cakalang

Student Feasibility Test Results

Small-Scale Trial

This phase involved testing the media with 10 11th-grade students at SMK N 4 Yogyakarta. Data collection took place on June 12, 2023. Students evaluated the material, media, and comic design, providing feedback through questionnaires. Students were given time to read and understand the comic material on Indonesian soups and soto, followed by a questionnaire with 30 feasibility items in Table 1. There are 8 students rated the media as highly feasible and 2 students rated it as feasible.

Table 1. Descriptive Results of Limited Scale Test Statistics

Interval	Category	Frequency (f)	Percentage (%)
97.5 < X ≤ 120	Highly feasible	8	80%
74 < X ≤ 97.5	Feasible	2	20%
52.5 < X ≤ 75	Unfeasible	0	0%
30 < X ≤ 52.5	Very unfeasible	0	0%
Total		**10**	**100%**

Large-Scale Trial

A large-scale trial was conducted with 36 11th-grade Culinary students at SMK N 4 Yogyakarta on June 13, 2023. Students evaluated the comic media based on the quality of the material, design, and usefulness for learning about Indonesian soups and soto. Feedback was collected through a 30-question questionnaire. Based on Table 2, 32 students rated the media as highly feasible and 4 students rated it as feasible.

Table 2. Descriptive Statistical Results of Large-Scale Trials

Interval	Category	Frequency (f)	Percentage (%)
97.5 < X ≤ 120	Highly feasible	32	88%
74 < X ≤ 97.5	Feasible	4	12%
52.5 < X ≤ 75	Unfeasible	0	0%
30 < X ≤ 52.5	Very unfeasible	0	0%
Total		**36**	**100%**

DISCUSSION

Development Process of the Indonesian Soup and Soto Comic Media

The development of the digital comic learning media for Indonesian Soup and Soto processing began with the define stage, involving curriculum analysis, student characteristics assessment, and material selection. The curriculum implemented at SMK N 4 Yogyakarta is the 2013 curriculum. Analysis of student characteristics, conducted through interviews and observations, revealed that students at SMK N 4 Yogyakarta prefer visually rich materials, which align with Munadi's (2013) assertion that media selection should match student characteristics and needs. The data indicated that students found visual aids more engaging and easier to understand, supporting the choice of digital comics for their attention-grabbing and memory-enhancing qualities (Toh et al., 2017).

Clip Studio Paint (CSP) was selected for creating the comic, due to its user-friendly interface and comprehensive tools, outperforming other software like Photoshop used by Carolin (2019). The comic's format was A5 with Comic Sans MS font in size 11, designed to cover all competency indicators for Indonesian soups and soto processing. The language used was everyday vernacular, ensuring accessibility for students. The final product included 29 pages, covering all necessary content, and was validated by media and content experts, leading to enhancements such as additional material to meet competency indicators, new recipes, and tailored introductory and concluding sections in line with the 2013 curriculum.

Feasibility of the Indonesian Soup and Soto Comic Media in the PPMI Subject

The feasibility of the digital comic media for the Indonesian Soup and Soto Processing material was assessed through validation by media and content experts, both of whom rated it as highly feasible. A small-scale trial with ten students showed that 80% rated it highly feasible, while 20% found it feasible. In a larger trial involving 36 11th-grade culinary students at SMK N 4 Yogyakarta, 88% rated the comic media as highly feasible. These findings align with Carolin's (2019) study on the feasibility of digital comics in other educational settings, which also received high feasibility ratings.

Similarly, research by Andriani (2019) demonstrated that digital comics in mathematics classes significantly improved student understanding. The feasibility of the comic media was evaluated on several aspects, including design, media presentation, and alignment with basic competencies. The design aspect focused on layout, font, illustrations, and language, while alignment with basic competencies ensured the quality and relevance of the material presented.

The development and implementation of digital comic learning media for Indonesian Soup and Soto processing material have significant implications for vocational education. The high feasibility ratings from both media and content experts, as well as positive student feedback, underscore the potential of digital comics to enhance learning engagement and comprehension (Sutin et al., 2022). By catering to diverse learning styles through the VARK model, digital comics offer an inclusive and effective learning medium (Sutin et al., 2022).

While the digital comic media requires some teacher facilitation to explain types of Indonesian soups and soto, the ease of access and readability on smartphones address common issues related to physical books. The limitations of digital comics, such as the reliance on static images, highlight areas for future improvement, such as incorporating interactive elements to further enhance student engagement. Overall, the study contributes to the growing body of evidence supporting the use of digital comics in vocational education, particularly in culinary arts, and offers a practical solution to improve student outcomes in Indonesian Soup and Soto processing.

CONCLUSION

The development of the Indonesian soup and soto comic media followed the 4D model, encompassing the define, design, develop, and disseminate stages. The digital comic, created in A5 page size (21cm x 14.8cm) with Comic Sans MS font size 11, was tailored to align with the learning material and covered all competency indicators for the processing and presentation of Indonesian soups and soto. The feasibility of the digital comic media was rated highly feasible by both content and media experts. The trial conducted with 36 11th-grade Culinary students at SMK N 4 Yogyakarta showed that 88% of the students rated it as highly feasible and 12% rated it as feasible. This indicates that the Indonesian soup and soto digital comic can be effectively used as a learning medium in the PPMI subject for 11th-grade Culinary students. Based on the research findings, it is recommended to enhance the comic media by including more comprehensive content on Indonesian soups and soto and adding a wider variety of recipes. This digital comic can serve as a valuable reference and learning medium for culinary vocational students, college students, and anyone interested in learning about the preparation and presentation of Indonesian soups and soto.

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