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Feasibility Test of The Design and Content of The *Hibiscus sabdariffa* L.–Based Rosella Dessert Delight E-Flipbook at Yani Catering and Wedding Decoration

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ABSTRACT

This research and development (R&D) project aims to test and analyze the design feasibility and content suitability of the Rosella Dessert Delight E-Flipbook through expert validators. Conducted at Yani Catering and Wedding Decoration from February to April 2025, this study employs a 3D model development approach (define, design, develop) with six main stages: preliminary survey, design using Canva, product design, validation, refinement, and result description. Research subjects included one media expert, two material experts, one chef, and 25 E-flipbook users. Data collection utilized validity testing analyzed using quantitative descriptive methods. The validity test for media and content produced an Aiken's V score of 0.617 (high category). Expert validation results showed media expert scored 90% (very high), subject matter expert 1 scored 72.5% (high), and subject matter expert 2 scored 82.5% (very high), with an overall average of 81.67% (very high). The ease-of-use and usefulness validation by 25 users achieved an Aiken's V score of 0.648 (high category) with an average percentage of 84.80% (very high). Reliability testing yielded Cronbach's Alpha values of 0.730 for expert validators and 0.790 for ease-of-use/usefulness (reliable category). Consequently, the Rosella Dessert Delight E-Flipbook is declared highly feasible and reliable for use as a digital operational guide in the food service industry, providing accessible, interactive, and paperless standard operating procedures that minimize operational errors and enhance workflow efficiency.

INTRODUCTION

Technological developments encourage food service companies to utilize digital media in conveying information about the products produced. Based on research, the digitization of documents and work instructions can increase the effectiveness of information delivery to support the standardization of work processes and facilitate access to information, so that it is considered much more efficient than conventional paper-based documentation (Leder et al., 2023). Therefore, the presentation of information digitally combined with interactive visuals is a crucial aspect because it allows information to be conveyed clearly, easily understood, easily accessible, and flexible to be applied in an industrial environment (Mutiara et al., 2022).

For the catering and wedding industry, the presentation of systematic and attractive information is very important to support product standardization, promotion strategies, and the dissemination of new menu innovations, both to consumers and internal workers. One of the interactive digital media that is developing and relevant to this need is *E-Flipbook*. This

media is an interactive electronic book that can contain text, images, audio, video, and digital links so that the presentation of operational materials becomes more systematic, attractive, and easily accessible through various multiplatform digital devices (Ngizzah et al., 2023).

One of the innovative dessert products based on local food developed in this industrial ecosystem is *Rosella Dessert Delight*. Dessert menu (*Dessert*) in the form of this pudding uses rosella flower petals (*Hibiscus sabdariffa L.*) as the main raw material to create dishes that have aesthetic and functional value. As a dessert, the quality of the pudding is largely determined by the precision of the cooking technique in processing the components of milk, sugar, and thickening agents (Kenneth et al., 2025). The chewy, semi-transparent physical characteristics of the pudding provide flexibility in the application of natural dyes made from Rosella extract. The innovation is manifested in the form of a 3–5-layer tiered pudding with pink to dark red color gradations to increase the aesthetic value of the presentation (*Food Presentation*) Wedding catering dishes (Karismawati et al., 2015).

In the production process, the combination of flavor and extraction of Rosella is integrated in the initial phase of gelatinization with the use of 10–15 grams of local type of gelatinous. The formulation is proven to produce pudding with balanced acid-sweet sensory characteristics, where the stability of the product and the freshness of the resulting flavor are considered ideal for the characteristics of the tropical climate with high humidity in Indonesia (Dewi & Mualimin, 2025). The anthocyanins contained in rosemary flowers are natural pigments that are sensitive to temperature. Increased temperature and duration can accelerate the dehydration of anticyanins, causing a decrease in the intensity of red and antioxidants. Temperature control and heating time during the processing factor are important factors to maintain the stability of natural color and product quality (Maghfira & Darmawati, 2021; Wu et al., 2018). Furthermore, the use of Rosella petals acts as a completely natural dye that is able to color the dough evenly without fading, while providing aroma *Floral* subtle resembles tea *Hibiscus* (Nuraeni, 2023).

Although the study of digital standardized recipes continues to develop, the current culinary literature is still generally limited to static text or Point of Sales (POS) systems for inventory management only. Previous studies by Eversberg and Lambrecht (2023) and Letmathe and Rößler (2022) have examined digital work instructions in manufacturing settings, but these studies focused on industrial production rather than culinary applications. Similarly, research by Mutiara et al. (2022) explored flipbook-based teaching materials in culinary arts education, yet did not address commercial food service operations. Research that specifically tests the feasibility of multiplatform interactive digital media (e-flipbooks) as an instrument for visual operational instructions (*digital work instructions*) and product aesthetic arrangement (*food styling*) in the mass-scale commercial food service industry is still very rare. This theoretical gap has an impact on the emergence of practical obstacles in the field, especially in the operation of the kitchen line of Yani Catering and Wedding Decoration Company. Until now, the documentation of the formulation of Rosella's dessert innovation menu at the company still relies on oral instructions and conventional paper notes. This conventional method triggers a high vulnerability to misinterpretation by production staff when handling large buffet volumes. In fact, the modern wedding catering industry is required to meet consumer expectations for the visual aesthetic quality of dishes consistently.

Unlike previous studies that focused on POS systems for inventory management or static text-based recipes, this research develops a visual-based digital SOP that addresses both production accuracy and aesthetic standardization. The distinctiveness of this research lies in the combination of food chemistry precision (Rosella anthocyanin stability during gelatinization) with commercial aesthetic standardization through interactive digital media, specifically designed for wedding catering buffet operations. To bridge this gap, this study aims to develop an operational digital work instruction instrument in the form of an E-Flipbook for the Rosella Dessert Delight commercial menu. Specifically, the research is directed to test and analyze the feasibility level of visual design (digital ergonomics and readability) through the validation of media experts, as well as the feasibility of operational substance based on the assessment of material experts, culinary practitioners, and users. In addition, this study aims to analyze the level of practicality, time efficiency, instructional understanding, and usability of this digital media from the perspective of chefs and direct production staff in the catering industry.

This research is expected to provide theoretical benefits in the form of scientific contributions to the realm of kitchen operational management regarding the transformation of recipe documentation towards visual-based digital standardization. Practically, for Yani Catering and Wedding Decoration Company, this media provides *an interactive digital Standard Operating Procedure* (SOP) that is able to reduce the number of product visual failures, accelerate the process of adapting new staff, and minimize manual errors due to work miscommunication. The overall output of this research can be a pilot model for food service business actors in packaging local food-based product innovations in a modern and efficient manner.

METHOD

This research was a development research (*Research and Development*) which is focused on testing the feasibility of media products (*formative evaluation*), without conducting food laboratory experiments or mass implementation. Using a development approach adapting a 3D (Define, Design, Develop) model that is modified to a limited extent *Develop* (Development and Feasibility Test) because this study only tests the feasibility (Yuniarti N, Pramudyarini A.R, 2023). The research was carried out for three months (February-April 2025) in two locations, namely the University (expert design and validation stage) and the Jakarta and Bogor branch of Yani Catering and Wedding Decoration (the stage of needs analysis and practicality testing by users).

The research subjects used expert validators and user validation consisted of one lecturer who was a material expert and one lecturer who was a media expert from the University as a theoretical validator, as well as one *chef staff* and 25 E-flipbook users. *The E-Flipbook* media developed contains the content of the visual guide *of the Rosella Dessert Delight* menu, which is a local gelatinous-based pudding (10–15 grams) with Rosella extract (*Hibiscus sabdariffa L.*). The content focuses on visual standardization of work instructions, *3 –5 layers of color gradation multi-layered* food styling techniques, and functional *garnish* application layouts for *catering buffets.*

Feasibility data was collected using a Likert scale questionnaire to measure the feasibility aspects of media design (layout, readability, digital aesthetics) as well as the

feasibility of the substance of the material (clarity of work steps, visual accuracy of guides, and practicality of instructions). All data from the two locations were then tabulated and analyzed using a percentage quantitative descriptive technique to determine the feasibility of this digital E-flipbook as an operational problem solver in the catering industry. The research instrument was adopted from a journal entitled: Validation Sheet: Instruments Used to Assess Products Developed in Development Research in the Education Field (Saputri Delma, Melissa, Hidayati Nurkhairo, 2023).

RESULTS AND DISCUSSION

This research and development resulted in a digital operational guidance product in the form of *E-Flipbook* for an innovative dessert menu named *Rosella Dessert Delight*. Main characteristics of *E-Flipbook* It is a digital book format (short for *Electronic Book*) which is environmentally friendly because it does not use paper (*Paperless*), and designed in such a way that it can be easily accessed by users anytime and anywhere through web-based pages *flipHTML5*. Utilization **E-Flipbook** As a digital media, it has been proven to be able to increase the flexibility of access to operational information and reduce ambiguity in the implementation of work instructions. This interactive format allows for the presentation of **Standard Operating Procedures (SOP)** become more attractive, easily accessible through various mobile devices (*Mobile Devices*), and easier for users to understand. Digitization of work instructions also supports a more effective learning process through visual and interactive presentation of information so that it can improve the accuracy of task execution and reduce operational errors compared to the use of conventional printed documents (Eversberg & Lambrecht, 2023; Letmathe & Rößler, 2022).

Rosella plant (*Hibiscus sabdariffa* L.) is a herbaceous-shaped annualized plant from the family ***Malvaceae*** which can grow to a height of about 0.5–3 m. The most widely used part of the plant is the flower petals (*Calyx*) which is dark red, fleshy, and has a sour taste due to the content of organic acids such as citric acid, malic acid, and ascorbic acid. The red color on the petals of rosella comes from the anthocyanin pigment which is dominated by ***Delphinidin-3-SquirrelSquirt*** and ***Cyanidin-3-sambubioside***, so it is widely used as a natural dye in food products. In addition, rosella petals contain vitamin C, phenolic compounds, flavonoids, and minerals that contribute to high antioxidant activity. The content of these bioactive compounds makes rosella potentially a functional food ingredient that has antioxidant, anti-inflammatory, antihypertensive, and antimicrobial activity (Shastri et al., 2021; Tomi Bastian R, Daskar A, 2025).

Pudding is a finishing food product (*Dessert*) semi-solid form obtained through the process of gel formation (*Gelation*) with the help of gelling agents, such as agar, carrageenan, gelatin, pectin, or other hydrocolloids. The main characteristics of pudding include a soft, elastic texture, being able to maintain shape after the cooling process, and having good water binding ability. The formation of gel structures in pudding is influenced by the type and concentration of hydrocolloids, ingredient composition, pH, as well as heating and cooling processes during processing. Therefore, the selection of gelling ingredients is an important factor in determining the texture quality, stability, and consumer acceptance of pudding products (Gao et al., 2024; Koko et al., 2023; Wadhani, L. P. P., Ratnaningsih, N., & Lastariwati, B. (2021). Nutritional Content, 2021)

As public interest in functional foods increases, the use of natural ingredients as a source of bioactive compounds continues to grow. One of the ingredients that has high potential is rosella petals (*Hibiscus sabdariffa* L.) which is rich in anthocyanins, flavonoids, phenolic compounds, and vitamin C. These compounds are known to have high antioxidant activity and have the potential to provide anti-inflammatory, antimicrobial, and antihypertensive effects. In addition to increasing the functional value of the product, the anthocyanins in rosella also produce a natural red color so that they can be used as an alternative to synthetic dyes (Lai et al., 2024). Several previous studies have shown that rosella has been widely applied to various food products, such as functional drinks, herbal teas, syrups, and fruit-based products, with results showing increased antioxidant activity, phenolic compound content, and consumer acceptance of the color and taste of the product (Dani et al., 2024). However, the use of rosella in gel-based semi-solid food products, such as pudding, is still relatively limited, so its development still has great opportunities.

Based on the results of the study, the use of rosella in pudding products is a form of functional food innovation that has the potential to produce products with good sensory characteristics while having added value from the health aspect. The gel structure of the pudding is able to homogeneously disperse rosella extract, maintain the natural color of anthocyanins, and produce a texture that consumers prefer. Therefore, the development of rosella pudding is expected to be an alternative to healthy food products based on natural ingredients that have higher functional value and economic value (Gao et al., 2024). Rosella pudding innovation is a form of functional food diversification by utilizing flower petals *Hibiscus sabdariffa* L. as a source of natural dyes and bioactive compounds. Rosella is known to contain vitamin C, minerals, fiber, as well as phenolic compounds and anthocyanins that have the potential to increase the nutritional value and antioxidant activity of food products (Salami, 2021). In particular, research **Gustiarani and Triastuti** shows that the use of rosella powder is 20% in *Bavarian pudding* produce the best formulation based on the characteristics of color, taste, and vitamin C content (Triastuti2, 2021).

1. Expert Validity Test

Expert validation is carried out to ensure that the content of the material prepared is in accordance with scientific standards, relevant to the learning objectives, and has a high level of accuracy so that it can support the learning process effectively. Based on the calculation of validity using the Aiken V technique scale, with the following criteria

Table 1. Aiken V Value and Categories

Aiken V Value	Categories
0.8 – 1	Very High
0.6 – 0.79	Height
0.40 – 0.59	Medium
0.20 – 0.39	Low
0.00 – 0.19	Very Low

Source: Adapted from Aiken (1985) and Retnawati (2016)

The following are the results of the validity test calculation using Aiken V

Table 2. Media and Material Validity Test Results

Item	Members			S1	S2	S3	Total S	V	Remarks
	Media	Material 1	Material 2						
Items 1-8	36	29	33	28	21	25	74	0.617	Height

Source: Authors' analysis of expert validation data, 2025

Based on the results of the media and material validity test, a total assessment score (Total S) of 74 with an Aiken's V value of 0.617 was obtained. The value is in the high category, thus indicating that the media and materials developed have a good level of validity based on the assessment of experts. In detail, the assessment was carried out by three validators, namely one media expert and two material experts. Media experts gave a score of 36, while material experts 1 and material experts 2 gave scores of 29 and 33, respectively. Furthermore, the results of the assessment were converted into Aiken's V value by obtaining a value of 0.617, which indicates that each assessment item has met the criteria of good validity. Thus, the media and materials developed are suitable for use as learning or counseling media, although improvements in accordance with the suggestions from the validators can still be made to improve product quality.

Table 3. Results of Validity Test Ease and Benefits

Validator		S		Total S	V	Remarks
P1	24	S1	17			
P2	27	S2	20			
P3	35	S3	28			
P4	32	S4	25			
P5	31	S5	24			
P6	34	S6	27			
P7	35	S7	28			
P8	30	S8	23			
P9	33	S9	26			
P10	29	S10	22			
P11	34	S11	27			
P12	32	S12	25	567	0.648	Height
P13	31	S13	24			
P14	30	S14	23			
P15	24	S15	17			
P16	26	S16	19			
P17	28	S17	21			
P18	31	S18	24			
P19	32	S19	25			
P20	29	S20	22			
P21	27	S21	20			
P22	23	S22	16			
P23	30	S23	23			
P24	24	S24	17			

P25	31	S25	24

Source: Authors' analysis of user validation data, 2025

Based on the results of the validity test of the convenience and benefit aspects, a total score (Total S) of 567 was obtained with an Aiken's V value of 0.648. The value is in the high category, which indicates that the instrument in terms of convenience and benefits has a good level of validity based on the assessment of validators. In this study, the validity of the content was carried out by involving 25 validators who provided an assessment of 7 items of instrument statements. The results of the assessment were then converted using the Aiken's V index and produced a value of 0.648. This value indicates that the items in terms of convenience and benefits have met the criteria of good validity, so that the instrument is considered suitable to be used to measure the ease of use and benefits of the media. However, input and suggestions from validators can still be used as evaluation material for improving the instrument so that the quality is more optimal.

Table 4. Validation Results of Media Experts and Subject Matter Experts

Validator	Percentage (%)	Categories
Media Member	90	Very High
Subject Matter 1	72.5	Height
Subject Matter 2	82.5	Very High
Average	81.666	Very High

Source: Authors' analysis of expert validation data, 2025

Based on the results of validation by media experts and material experts, it was obtained that media experts gave a score of 90% with a very high category, which shows that the developed media has fulfilled the aspects of appearance, design, and function very well. Meanwhile, subject matter expert 1 gave a score of 72.5% in the high category, which shows that the content of the material is in accordance with the learning objectives although there are still some suggestions for improvement. Furthermore, subject matter expert 2 gave a score of 82.5% in the very high category, which indicates that the material presented has been assessed very well in terms of accuracy, completeness, and suitability of content.

Overall, an average percentage of 81.666% was obtained with a very high category. These results show that the media and the materials developed have an excellent level of feasibility based on the assessment of experts. Thus, the media is suitable for use as a learning or counseling medium, while still considering suggestions and input from validators as an effort to improve the product.

Table 5. Results of Validation of Convenience and Benefits

Validator	Percentage (%)	Categories
1	68.571	Height
2	77.143	Height
3	100	Very High
4	91.429	Very High
5	88.571	Very High
6	97.143	Very High
7	100	Very High

8	85.714	Very High
9	94.286	Very High
10	82.857	Very High
11	97.143	Very High
12	91.429	Very High
13	88.571	Very High
14	85.714	Very High
15	68.571	Height
16	74.286	Height
17	80	Very High
18	88.571	Very High
19	91.429	Very High
20	82.857	Very High
21	77.143	Height
22	65.714	Height
23	85.714	Very High
24	68.571	Height
25	88.571	Very High
Average	84.800	Very High

Source: Authors' analysis of user validation data, 2025

Based on the results of the validation of the aspects of convenience and benefits, it was obtained that validator 1 gave a value of 68.57% with a high category, which shows that the media/product developed has a level of ease of use and good benefits for users. Validator 2 gave a score of 77.14% with a high category, while validator 3 obtained a score of 100% with a very high category, which indicates that the media is considered very easy to use and provides optimal benefits. Validator 4 gave a score of 91.43% with a very high category, showing that the aspects of convenience and benefits in the media have been fulfilled very well.

Furthermore, validators 5 to 14 gave ratings with a percentage range between 85.71% to 97.14% with a very high category, which shows that most validators rated the media as having a good level of ease of use, easy to understand, and provide benefits in accordance with development objectives. Meanwhile, validator 15 obtained a score of 68.57%, validator 16 of 74.29%, and validator 21 of 77.14% which was in the high category. These results show that the media has met the aspects of convenience and benefits, although there are still some inputs that can be used as material for improvement.

Validator 17 obtained a score of 80.00% with a very high category, validators 18 to validator 20 obtained a score between 82.86% to 91.43% with a very high category. Validator 22 gave a score of 65.71% with a high category, validator 23 of 85.71% with a very high category, validator 24 of 68.57% with a high category, and validator 25 of 88.57% with a very high category. Overall, the results of the assessment showed that the majority of validators responded positively to the convenience and benefits aspects of the developed media.

Based on the results of the recapitulation of all validators, an average percentage score of 84.80% was obtained with a very high category. These results show that the developed media/product has an excellent level of ease of use and benefits based on the assessment of the validators. Thus, the media is considered very suitable for use, because it meets the criteria of ease of use, easy to understand, and able to provide benefits for users. However, some input from validators can still be considered to make improvements so that the quality of the media is more optimal.

2. Reliability Test

The reliability test is useful to determine whether the research instrument used, in this case the questionnaire can be used more than once or at least by the same respondent. Reliability calculation is the calculation of the consistency of questionnaire data using the *Alpha Cronbach* formula. The use of this formula is adjusted to the scoring technique carried out on each item in the instrument. The item-total correlation value in an indicator to be declared reliable is at least 0.70. The following are the results of the reliability test of each variable

Table 6. Reliability Test Results

Instruments	Cronbach Alpha	Verdict
Media Member and Material Expert	0.730	Reliable
Facilities and Benefits	0.790	Reliable

Source: Authors' analysis of reliability test data using SPSS, 2025

Based on the results of the reliability test, the validation instrument of media experts and material experts obtained a Cronbach's Alpha value of 0.730. These values indicate that the instrument has a good level of internal consistency and is included in the reliable category, so it can produce consistent data when used to assess the quality of media and materials.

Meanwhile, the ease and benefit instrument obtained a Cronbach's Alpha value of 0.790, which is also above the minimum acceptable limit of reliability (≥0.70). These results show that the instrument has a good level of internal consistency and can be categorized as reliable.

Overall, the two instruments used in the study met the reliability criteria. This shows that the validation instruments of media experts and material experts as well as the ease and benefit assessment instruments have a good level of consistency, so they are suitable for use as a data collection tool in research and are able to produce reliable measurements.

CONCLUSION

The validation results by media experts and subject matter experts showed an average percentage of 81.67% (very high category) with an Aiken's V index value of 0.617. The assessment by 25 users/practitioners on the aspects of ease of use and benefits obtained an average percentage of 84.80% (very high category) with an Aiken's V index of 0.648. In addition, the consistency level of the measurement instrument is categorized as reliable with Cronbach's Alpha values of 0.730 (expert validator) and 0.790 (user). The integration of this E-Flipbook has proven to be effective in providing ease of access, clarity of *visual food styling* guidelines, minimizing the risk of operational errors, and providing environmentally friendly (*paperless*) digital SOPs for Yani Catering and Wedding Decoration Companies. Although

the use of Canva and FlipHTML5 in the development of E-Flipbook has met the basic standards of the feasibility test, the platform still has technical limitations in facilitating complex interactivity. In order to optimize media functionality and user engagement in a state-of-the-art manner, further research is recommended to switch to more dynamic *e-learning* platforms such as *Articulate Storyline 360, Heyzine, or* React/Flutter-based. The transformation of media towards a more interactive platform is expected to increase the precision and effectiveness of the implementation of Standard Operating Procedures (SOPs) in the field. This research and development succeeded in compiling and producing a digital operational guide media in the form of *FlipHTML5-based Rosella Dessert Delight* E-Flipbook which is designed to standardize dessert menus in the food service industry. Based on the results of feasibility tests, this product is scientifically proven to meet very high feasibility and reliability criteria. The results section describes experiments that were completed before the paper was written. Therefore, the simple past tense is the natural choice when describing the results obtained.

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