

# Testing the Readability of the Digital Practice Module "Local Patisseries Innovation" for the Final Assignment of the Culinary Arts Study Program

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**Abstract.** The Industrial Revolution 4.0 demands continuous innovation. Mondelez's "State of Snacking" survey found patisserie products are the favorite products of most Indonesian people. The reliance on imported ingredients is concerning for the Indonesian economy, leading to a growing trend toward using local ingredients. However, there is still minimal awareness and literacy regarding local patisserie innovations. There is no digital practice module for Local Patisseries Innovation to support the Culinary Arts Study Program Final Assignment, so students do not have a reference as a source of guidance for product innovation procedures that are relevant to the current culinary industry. This research developed a digital module for local patisserie innovation and aimed to assess its readability. This research approach is quantitative descriptive with the ADDIE development model. Digital modules were developed using the Canva application and equipped with barcodes that can increase accessibility. The readability test was carried out using a Likert scale at level 4. The readability test of the digital module was carried out on students of the D3 Culinary Arts Study Program at the Jakarta Creative Media State Polytechnic. The average result was 3.46 with readability criteria.

**Keyword:** Digital Module, Readability Test, Patisserie Innovation, Local Materials

## 1 Introduction

The quality of students' final assignments in the Culinary Arts Study Program depends heavily on the guidelines they follow. The theme of patisserie innovation is a theme that is always present in every generation. However, there is no reference to the theme of local culinary innovation that is synchronized with SN-Dikti in the study program. There is no synchronization between lecturers and SN-Dikti regarding learning the Pastry Bakery (Patiseri) course, and there are still few lecturers with a food production background in the ratio of 1: 5 [1]. This has an impact on the less than optimal results obtained from the Final Project of culinary arts students. The ratio of lecturers with food production backgrounds which is still minimal means that the products produced are less able to compete with graduates from other campuses. Breakthroughs that can be taken by utilizing technology are one form of technology-based learning media is digital modules. Digital modules can be considered as a product that students can use anytime and anywhere. Digital modules are prepared using technology in preparing teaching materials. Digital modules or known as e-modules are conventional modules equipped with information technology to facilitate the affordability and attractiveness of the module. Applications vary from involving barcodes for ease of reach, to integrating various technologies into modules. This application is proven to increase learning outcomes by up to 92.94% [2]. Digital modules

are considered very practical because apart from being easy to access, digital modules are very easy to integrate with online learning systems [3]. Digital modules are in great demand as a learning alternative for all levels of society. Digital modules are an attractive alternative teaching material, because they can contain audio and video adapted to the learning material as well as materials and images [4]. The readability test is a test of the effectiveness of a learning media. Segmentation and level of absorption of teaching material from a learning media are obtained through readability test treatment. A learning media is said to be effective for the teaching and learning process if the readability test results reach a minimum of 75% [5]. In the readability test, the appropriate segmentation for a learning media can be determined. In previous research, it was found that the Digital Flipbook-based E-Module for high school students was found to have high suitability for class X students. The validity of this digital module reached 82% and only 39% of responses were negative. [6]. Therefore, testing the readability of digital modules is considered very important.

The potential for local food ingredients in Indonesia is very large. So far, the interest of Culinary Arts students at the Creative Media State Polytechnic is also very high, this can be balanced by its implementation in the final assignment. Therefore, researchers are interested in raising this theme with the title "Test Of The Readability Of The Digital Module Of Local Patisery Innovation As A Supplement To The Ideas For The Final Project Of The Culinary Arts Product". The hope is that this research can become an embryo for the active role of Culinary Arts students in developing international products made from local food.

## **2 Method**

This research approach is quantitative descriptive with the ADDIE development model. The ADDIE stages are: a) analysis; b) designing; c) development; d) implementation and e) evaluation. [7].

### **2.1 Sample and Survey**

The product developed in this research is a digital module for local patisserie innovation for students who will prepare their final assignments in the D3 culinary arts study program. This research was conducted at the Creative Media State Polytechnic and the subjects of this research were culinary arts study program students. There were 45 students, with 15 representatives from each class.

### **2.2 Tools, materials and Data Analysis**

The tools used in this research were a laptop, the Canva application. Laptops are used as tools for designing content and digital asset modules. Canva was used to layout the modules being developed. Canva is preferred for digital book or module design because it offers convenience and features that support a fast, intuitive and flexible design process, especially for users who may not have a graphic design background. Advantages include Easy to Use Interface, Various Template Choices, Collaboration Features, Access to Stock Photos, Illustrations, and Fonts, File Export Flexibility, Cost Effective. Google form is used to carry out a questionnaire to test the readability level of the module. Google Forms is a practical and economical choice for surveys or questionnaires because of its flexibility, ease of use, and basic analysis features that are sufficient for many research or data collection needs. Readability tests will be carried out in

terms of appearance, material, language, functionality. The combination of Canva and Google Forms creates modules that are not only visually appealing, but also interactive and easy to evaluate. This allows module creators to design effective content and ensure that learning needs are properly met. The development model chosen and most appropriate to problem preferences is the ADDIE model which is carried out in stages: a) analysis; b) designing; c) development; d) implementation and e) evaluation. This research used research instruments in the form of validation sheets for practitioners in the field of patisserie, pastry bakery competency assessors and coordinators of the D3 Culinary Arts study program, validation guidelines, validator and student readability test response questionnaires. Data collected through predetermined research instruments will be analyzed and shared quantitatively to ensure the validity and readability test of the modules developed. Analysis of the level of validity of the Local Patiseri Innovation digital module using criteria for the validity of teaching materials can be seen in the following table:

**Table 1.** Module Readability Validation Criteria [8]

<b>Validation Category</b>	<b>Average Score</b>	<b>Explanation</b>	<b>Action</b>
Very Valid / Very Eligible	$3,26 < x \leq 4,00$	Very suitable for use without revision	No need for revision
Fairly Valid / Decent	$2,51 < x \leq 3,26$	Suitable for use with partial revisions	Partial revision
Invalid / Ineligible	$1,76 < x \leq 2,51$	Not suitable for use, needs revision	Partial revision and review
Invalid / Ineligible	$1,00 < x \leq 1,76$	Very inappropriate, needs total revision	Total revision

### 3 Result

Based on data analysis obtained from a quantitative approach with the ADDIE development model, it is described as follows:.

#### 3.1 Analysis

Teaching materials developed based on the CPL and CPMK Culinary Arts Study Program of the Creative Media State Polytechnic. The material that will be taught based on CPL and CPMK is as follows: Innovation, starting from the understanding, characteristics, goals and benefits of innovation. This material is important to discuss because the topic of research is an opening topic in the development of critical and creative thinking, because innovation is not just about new ideas but overcoming out-of-the-box challenges. Patiseri, starting with the definition of the types of cookies, pie, choux paste and cake. This material is important to discuss because it provides a foundation of knowledge and practical skills in the field of pastiseries. Local food ingredients from definition, to classification and examples. Studying local food ingredients from their definition to their classification provides broad insight into how to make maximum use of Indonesia's natural and cultural riches, support food security, utilize local potential, and preserve local culture and wisdom. Innovation engineering procedures from determining the main objective, commodity utilization, substitution, new product, enrichment, reference recipe from formulation testing, stability testing, standardization testing, and final product. With this material, students can understand the important steps needed to produce high quality products that meet market needs and have high competitiveness. In the last chapter, the downstreaming

of competitions, research and community service is discussed. Each chapter ends with a worksheet.

### 3.2 Designing

This stage was carried out using the FGD (Focus Group Discussion) method with the study program coordinator and several culinary arts students. The FGD was carried out offline involving 8 students from samples in semesters 2, 4 and 6. From this is that results will be obtained describing the content that will be developed. Followed by a discussion of the FGD results with research members. Get an overview of the chapters and sub-chapters that will be written. The following is a digital module design framework table:

**Table 2.** Design Framework for Local Patisseries Innovation Digital Modules

No.	Division of Chapters	Description
1.	Opening	The opening section includes: front cover, foreword, table of contents
2.	Contents	The content section includes: core material related to innovation, patisseries, local food ingredients, innovation technical procedures, and downstreaming
3.	Closing	The closing section includes: bibliography

Feedback from the FGD results resulted in a decision to create an attractive design, with a variety of colors, concise but content content because basically this module is a supplement to complete the Final Assignment guidelines set by the campus. The reason for structuring the chapters is in such a way that it facilitates students' thinking framework. Then designed a readability test questionnaire instrument that was used using a Likert scale. The questionnaire instrument was created according to the needs of the readability test covering several aspects, namely appearance aspects, material aspects, language aspects and functional aspects.

### 3.3 Development

Pada tahap pengembangan meliputi beberapa bagian yang dilakukan diantaranya:

#### 3.3.1 Product Development

The manuscript is prepared according to the target readership. In preparing this manuscript, the limitations used were the limitations of D3 Culinary Arts students. The hope is that in this way a manuscript will be obtained that has good quality content. The contents of the digital module manuscript include the opening, contents and closing.



Fig. 1. Cover e-Module with additional barcode, Foreword and Table of Contents



Fig. 2. CHAPTERS 1-5 (Innovation, Patisseries, Local Food Ingredients, Innovation Technique Procedures, Processing)



**Fig. 3.** Closing, Bibliography

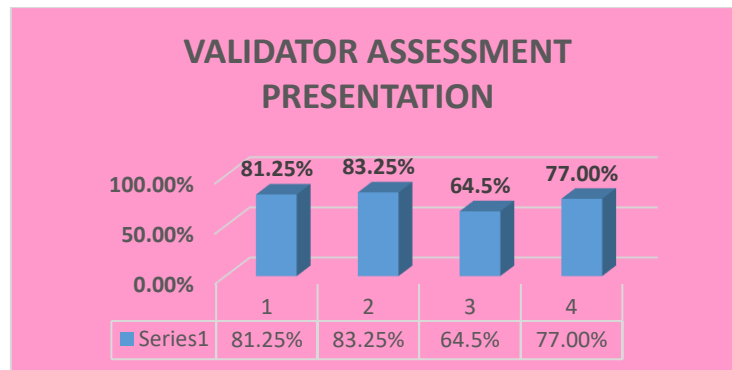
### 3.3.2 Module Readability Validation

Validation is carried out to assess digital modules in terms of appearance, material content, language and functionality used. There are 3 selected validators who are competent in this field. Based on the three validation tests, the average results obtained can be seen in following table:

**Table 3.** Recapitulation of Validation Results

No	Aspect	Average	Percentage Score	Validation Category
1.	Appearance	3,25	81,25%	Fairly Valid/Decent
2.	Material Content	3,33	83,25%	Very Valid / Very Eligible
3.	Language	2,58	64,5%	Fairly Valid/Decent
4.	Functionality	3,08	77,00%	Fairly Valid/Decent
Overall Average		3,06	76,50%	Fairly Valid/Decent

The table shows that the local patisseries innovation digital module that has been created produces an average of 3,06 or 76.50%, meaning that it is quite valid/worthy in terms of appearance, material, language and functionality. The following display in graphical form can be seen in the following image:



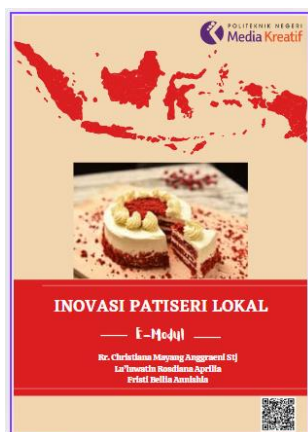
**Fig. 4.** Graph of Validation Recapitulation Results

There are several aspects that need to be improved before entering the readability test stage for student respondents, including the following:

**Table 4.** Aspects that need to be improved based on validation results

No.	Suggestions / Enter Improvements	Improvement Suggestions
1.	Appearance	- The appearance of the cover is enhanced to make it more attractive, provide pictures of the patisserie products in sketch form
2.	Language	- There are multiple interpretation sentences related to "Stability Test", use another sentence as a sub-chapter - Using the generally foreign term patisserie, provide vocabulary about patisserie
3.	Functionality	- Using a flipbook requires smooth internet access

Based on these improvements, the following results were obtained:



Before Revision



After Revision

**Fig.5.** Comparison of differences in front cover appearance before and after revision

Feedback from validators is related to the appearance of the cover, which illustrates various patisserie products rather than just one type, which was originally only red velvet as a symbol. The change was to use images of cakes such as strawberry shortcake, red velvet cake and roll cake with the position of the cake design being round. it's on the edge and the slice shape is in the middle.



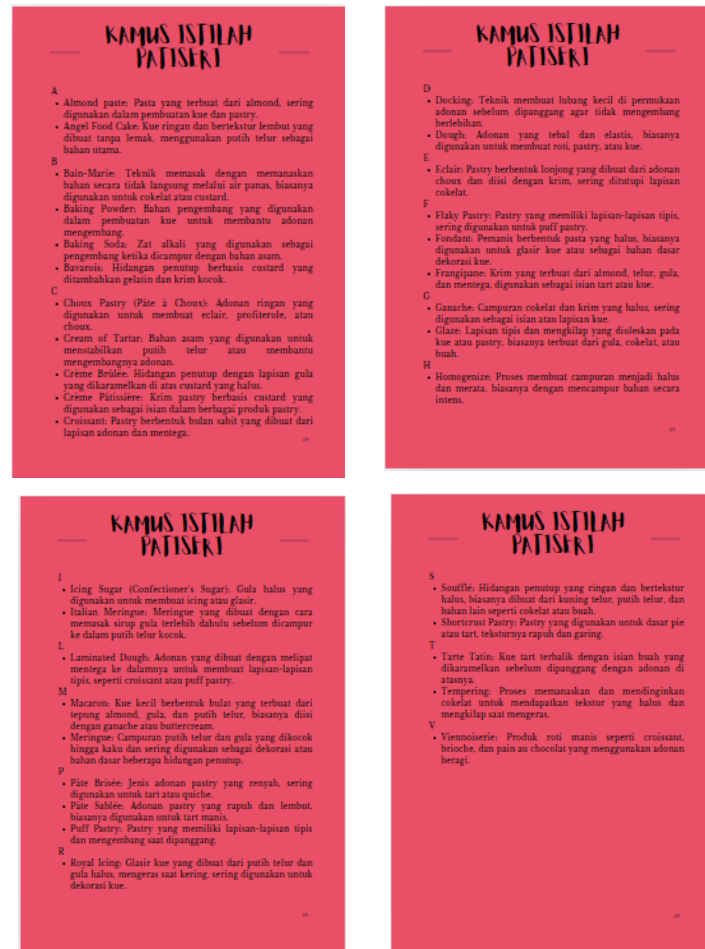
a. Before Revision

b. After Revision

**Fig. 6.** Comparison of Content Differences in Multiinterpretation Sentences between Stability Test and Sensory Test

Validators suggest changes to terms if the original terms are deemed confusing or do not reflect comprehensive testing coverage. In this case, the stability test referred to is organoleptic stability, in the form of aspects of taste, color, aroma, texture and appearance. With the sensory test, you will get the stability of the product being created.





**Fig. 7.** Addition of the Patisserie Terms Dictionary to improve understanding of terms in the digital module

The validator's suggestion of adding a bibliography and patisserie-specific vocabulary is very important in the module because it provides references and clarity for the reader. The following are the reasons why these elements are recommended by validators, including bibliography as a strong reference base, patisserie vocabulary to avoid ambiguity, providing clarity in technical terms and ease of learning for beginners.

Meanwhile, for the functional aspect in the form of signals, please use a stable internet network.

### 3.4 Implementation

Implementation is an activity or action taken to carry out a plan that has been made in detail, with the aim of achieving the target that has been set, namely carrying out a readability test for the target readers, namely culinary arts students. [9]. The process of testing the readability of the local patisserie innovation digital module on 45 respondents with respondents initially being

asked to access and analyze the digital module via the link <https://publuu.com/flip-book/649829/1449040/page/2> or <https://shorturl.at/ZgYUj>. After respondents have finished accessing and analyzing then fill in via Google form with the following link <https://forms.gle/v8EFFoEywBUbwLun7>. Specific aspects tested include appearance including text and writing, table of contents, module presentation, level of attractiveness. The next aspect is material, this aspect consists of conformity with SN-Dikti, motivation to innovate, reviewing the level of understanding, adding insight and supporting skills. The next aspect is language, with details in the form of understanding words/sentences, the absence of multiple interpretation sentences, good and correct use of Indonesian, ease of understanding foreign terms. The last aspect tested was the functional aspect with several questions such as ease of access, both in terms of internet quality, flip books, YouTube links and question links. Student feedback was obtained after the data from Google Form was processed. The impact of the implementation process meant that researchers got direct answers from users regarding the readability results of the local patisserie innovation digital module. Next, at the evaluation stage, improvements to the results can be obtained.

### 3.5 Evaluation

At this evaluation stage, the results of the readability test with 45 respondents were obtained as follows:

**Table 5.** Recapitulation of Readability Test Results for the Local Patiseri Innovation Digital Module

No	Aspect	Average	Percentage Score	Category
1.	Appearance	3,58	89,5%	Very Decent/Readable
2.	Material Content	3,43	85,75%	Very Decent/Readable
3.	Language	3,43	85,75%	Very Decent/Readable
4.	Functionality	3,43	85,75%	Very Decent/Readable
<b>Overall Average</b>		<b>3,46</b>	<b>86,5%</b>	<b>Very Decent/Readable</b>

The following is a summary of the readability test results for the Local Patiseri Innovation Digital Module based on the evaluation of 45 respondents: From the readability test results, the Local Patiseri Innovation Digital Module obtained the following scores:

- Display Aspect: Average score of 3.58 with a percentage of 89.5% - "Very Decent/Readable" category.
- Material Aspect: Average score 3.43 with a percentage of 85.75% - "Very Decent/Readable" category.
- Language Aspect: Average score of 3.43 with a percentage of 85.75% - "Very Decent/Readable" category.
- Functional Aspect: Average score of 3.43 with a percentage of 85.75% - "Very Decent/Readable" category.

Overall, this module achieved a total average of 3.46 or 86.5%, which is included in the "Very Decent/Readable" category.

Analysis of the meaning of the scores and findings shows that the display aspect strongly supports readability, which is important in making it easier for readers to navigate content. The material, language and functional aspects of the module are considered good enough to deliver content effectively and facilitate intuitive user interaction. High scores in all these aspects

indicate that the module has been designed taking into account user needs and is assessed as meeting good quality standards for learning and skills development purposes.

Even though the results were positive, there were several limitations in the evaluation, namely the limited sample size. While 45 respondents is representative, it may not reflect the wider diversity of potential users, especially if the module will be used by audiences with different levels of education or cultural backgrounds. Focusing on readability, readability evaluation only includes assessment aspects related to ease of understanding and visuals. Other aspects such as depth of material, relevance of content to the local patisserie industry, and interactive appeal have not been fully evaluated. Respondent subjectivity, that is, respondents' assessments tend to be subjective and can be influenced by personal preferences or familiarity with visual perception, especially in aspects of appearance and language.

With good readability, this module has the potential to be a useful learning aid, especially if aimed at education and practical skills development. Suggestions for improving readability tests such as increasing sample variations, using more detailed instruments, behavior-based testing.

#### **4 . Discussion**

The quantitative research approach using the ADDIE model produces products in the form of digital modules whose readability is tested as a supplement to the final assignment of students in the culinary arts study program. The aim of this research is to determine the readability level of the local patisserie innovation digital module developed for Polimedia students. The language used in this digital module is Indonesian which is equipped with a dictionary of patisserie terms at the end of the module. Based on the results of the validity test by the validator, it is known that the Local Patiseri Innovation Digital Module has met the validity criteria. However, to achieve feasibility, several revisions were carried out, namely in appearance, language and functional validation, while in the material aspect there is no revision required because it meets the valid criteria. This is in line with [10] with the title: The results show that the module has a good readability level and can be used in the learning process. The Local Patisseries Innovation Digital Module which had been declared valid was then tested on 45 selected culinary arts student respondents and lecturers to determine the level of readability through the data obtained. Based on the research results, it was found that an average of 3.46 or 86.5% of respondents gave it very appropriate/readable, meaning that this digital module is suitable for use as a supplement to the final assignment of culinary arts students at the State Creative Media Polytechnic. This is in line with research by Suarlin et al [11] research regarding the development of interactive digital modules based on self-learning in scientific writing courses which shows feasibility of 90% from the results of expert and user assessments, which is categorized as very feasible. Apart from that, other research which developed interactive digital books for interactive multimedia courses also stated that this module was very suitable for use with a score of 3.64 from a small group beta test. [12]. Other relevant supporting literature is the journal [13] in this journal a result of 4.5 was produced in the very readable/very clear category. The findings of this study suggest that readability aspects can be further optimized to achieve higher scores, especially when compared with interactive digital modules and digital books for academic topics. In this context, a more intensive approach to interactivity and a stronger self-learning design could help this module achieve better scores and a more positive user experience. By considering these findings and comparing them with previous studies, there is great potential to strengthen interactivity, enrich materials, improve visuals, and expand user evaluation. This approach is expected to help local patisserie modules achieve optimal levels of readability and suitability, as well as becoming more relevant and effective for users with various needs.

## 5. Conclusion

Research regarding the readability test of the local patisserie innovation digital module as a supplement to the final assignment of culinary arts students found that this module was considered very feasible and readable by the majority of respondents. Of the 45 selected culinary arts students and lecturers who were respondents, the average readability assessment reached 3.46 or 86.5%, which shows that this module has met quality standards in terms of readability and ease of use. This research strengthens previous findings regarding the effectiveness of digital modules in supporting independent learning and increasing student engagement. This module not only acts as an additional study guide, but also serves as a valid reference source for students' final assignments. The development of digital modules like this is very relevant in supporting technology-based curricula and in accordance with the demands of industry 4.0, providing flexibility and accessibility for students in studying specific topics. Thus, this local patisseries innovation digital module is effective as a learning tool and worthy of being integrated into the program culinary arts education. The implications of developing innovative digital modules for local patisseries are very relevant in supporting vocational students' final assignments, especially in culinary arts study programs. Digital modules not only make it easier for students to access structured and interactive teaching materials but also enable them to develop skills independently. The use of digital modules in vocational education, especially in the field of culinary arts, strengthens the effectiveness of practical skills-based learning. Digital modules can offer simulations, interactive exercises, and video demonstrations of relevant techniques, thereby overcoming the limitations of book-based or theory-only learning. This also supports distance or flexible learning, so students can access the material at any time. Suggestions for further development of integration of direct practical evaluation through the development of digital modules equipped with direct skills evaluation features via videos or photos of the process from students can increase the accuracy of practical skills assessment. Utilizing Augmented Reality (AR) technology, AR can be applied to show patisserie techniques in three dimensions, so that students can see details of more difficult techniques in an interactive environment. Long-term research regarding the effectiveness of digital modules, further research can evaluate learning outcomes longitudinally to determine the long-term impact of using digital modules in improving student skills and competencies. adapting materials based on locality, considering the diversity of local culinary delights, further development could include modules based on local ingredients and techniques, so as to develop culinary innovations that remain rooted in local wisdom. It is hoped that this digital module will be able to become a comprehensive and innovative learning tool, as well as making a significant contribution to the development of vocational education in the culinary field.

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