The Development of an Android Studio-Based E-Module to Optimize Students' Understanding of Sauce Material in Continental Food Courses

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Article Info

ABSTRACT

This research aims to develop and test the effectiveness of an Android Studio-based e- module to optimize students' understanding of sauce material in the Continental Cuisine course. The e-module integrates systematic learning content with interactive features such as tutorial videos, quizzes, and simulations. The study follows the ADDIE model through analysis, design, development, implementation, and evaluation. The findings indicate that the developed e-module significantly improves students' comprehension of sauce concepts, as evidenced by higher post-test scores compared to pre-test results. Experts' validation and students' responses also confirmed the feasibility and usability of the e-module as a supporting digital learning media..

ABSTRAK

Penelitian ini bertujuan untuk mengembangkan dan menguji efektivitas e-modul berbasis Android Studio dalam mengoptimalkan pemahaman mahasiswa terhadap materi sauce pada mata kuliah Makanan Kontinental. E-modul ini dilengkapi dengan konten pembelajaran sistematis serta fitur interaktif berupa video tutorial, kuis, dan simulasi. Penelitian menggunakan model ADDIE dengan tahapan analisis, desain, pengembangan, implementasi, dan evaluasi. Hasil penelitian menunjukkan bahwa e- modul yang dikembangkan mampu meningkatkan pemahaman mahasiswa, ditunjukkan dengan hasil post-test yang lebih tinggi dibandingkan pre-test. Validasi ahli dan respon mahasiswa juga menyatakan bahwa e-modul ini layak digunakan sebagai media pembelajaran digital inovatif.

INTRODUCTION

The Continental Food course is one of the core courses in the Culinary Studies Program that requires students to master the theory as well as practice of international food processing, including skills in making sauces. In the culinary world, sauce functions not only as a complement to dishes, but also has an important role in improving the taste, texture, aroma, and appearance of food (Sadiman, 2014). Thus, mastery of sauce making techniques is a basic competency that must be possessed by Culinary students in order to develop their creativity and professional skills.

However, learning practices show that students still have difficulty understanding basic concepts, ingredient composition, and variations in the application of sauce. The limited number of interactive learning resources makes conventional learning methods, such as the use of textbooks and hands-on demonstrations, less effective in supporting students' active involvement (Dimyati & Mudjiono, 2009). In addition, the limited opportunity to repeat the material independently outside of lecture hours is one of the main obstacles in the learning process.

The development of information and communication technology has opened up great opportunities in supporting digital-based learning. Android application-based learning media is considered to be able to increase student engagement because it can be accessed anytime and anywhere (Ozdamli, 2012). Previous research has also shown that the use of digital learning media can increase student learning motivation and learning outcomes in various fields (Darmawan, 2013; Purbasari, 2013). However, most of these studies still focus on the field of general education and have not been directed much at the development of culinary learning media, especially *sauce material in the Continental Food course.*

Based on this analysis, this research focuses on the development of an Android Studio-based e- module specifically designed for sauce materials. *This* e-module not only presents theoretical content, but also features interactive features in the form of video tutorials, simulations, quizzes, and a friendly user interface. With the integration of multimedia features, it is hoped that this e- module will be able to improve students' understanding both in cognitive (theory) and psychomotor (practice) aspects.

The novelty of this research lies in the development of an Android Studio-based e-module focused on the culinary field, especially sauce materials, which have not been studied much before. Thus, this research is expected not only to contribute to improving the quality of learning in the Culinary Studies Program, but also to provide a basis for the development of a wider digital technology- based culinary learning media in the future.

METHODS

This research uses the Research and Development (R&D) method with the ADDIE (Analysis, Design, Development, Implementation, Evaluation) model. The analysis stage includes literature study and identification of student needs. The design stage composes a storyboard, content framework, and application interface design. The development stage involves coding e-modules in Android Studio with the integration of video tutorials, quizzes, and simulations. The implementation stage is carried out through a limited trial (beta testing) for students. The evaluation stage includes expert validation and effectiveness measurement through pre-test and post-test. The instruments used were in the form of validation questionnaires, student response questionnaires, and comprehension tests. Data analysis was carried out quantitatively, descriptively, and qualitatively.

RESULTS AND DISCUSSION

The resulting product is in the form of an Android Studio-based e-module application that contains sauce theory materials, practical tutorial videos, interactive quizzes, and self-evaluation features. The limited trial showed an increase in student understanding, as evidenced by a higher post-test score than the pre-test. The validation of media experts gave a score of 80.65% and material experts 85.80%, which indicates a worthy category. Student responses of 93.03% stated that the application is easy to use, interesting, and useful to support learning. These results are consistent with previous research that digital learning media can increase student motivation and learning outcomes. The advantage of this e-module lies in the interactive multimedia integration that allows students to learn independently, flexibly, and iteratively as needed.

Table 1. Student Pre-test and Post-test Results

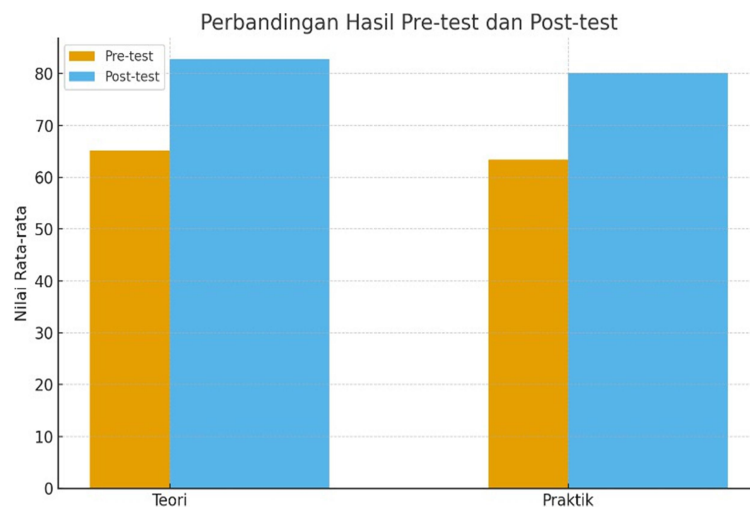| Aspects	Average Pre-test	Post-test average	Increase (%)
Theoretical Understanding	65,20	82,75	17,55
Practical Skills	63,40	80,15	16,75

Figure 1. Comparison of the average results of Pre-test and Post-test students.

Table 2. Expert Validation Results

Validator	Aspects	Score (%)	Category
Media Member	Display, Interactivity, Accessibility	80,65	Proper
Material Expert	Relevance, Accuracy, Systematic	85,80	Highly Worth It

Table 3. Student Response to the E-Module

Aspects	Percentage (%)	Category
Ease of Use	92,5	Excellent
Attractive Display	93,2	Excellent
Material Suitability	94,1	Excellent
Benefits for Learning	92,4	Excellent
Average	93,03	Excellent
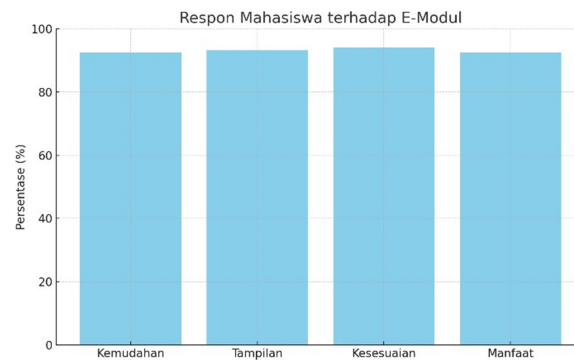
Figure 2. Student response to Android Studio-based e-modules.

E-Module Product Pictures

At this stage, the interface of the Sausku application shows a visual design that is attractive, educational, and easy for students to navigate. The app displays main menus such as: Sauce Materials & Functions, Sauce Making Ingredients, Types of Sauces, Sauce Quality, and Sauce Storage.

a. App Home View: Home presents large icons with clear labels, allowing students to directly select the learning materials they need.
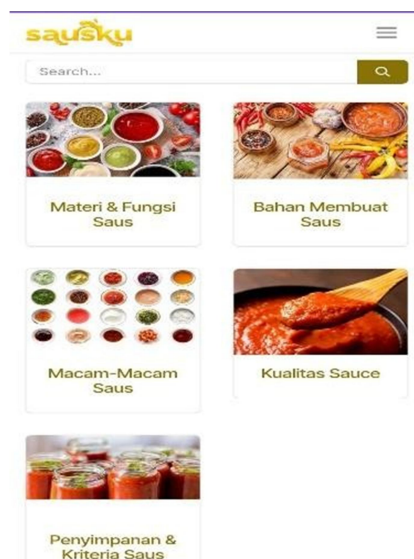
Figure 3. E-Module Main Menu display (screenshot of the Android Studio app).

b. Sauce Making Materials: The application presents liquid ingredients, thickening agents, and flavoring seasonings interactively. The in-depth explanation is complemented by a text and visual display of the original ingredients used in the making of the sauce.

Figure 4. Example of Sauce Material Page in E-Module.

c. The main feature of this application is the embedding of YouTube tutorial videos on making Bechamel Sauce and Velouté Sauce. Students can play directly from the app to see the real process of making sauce.
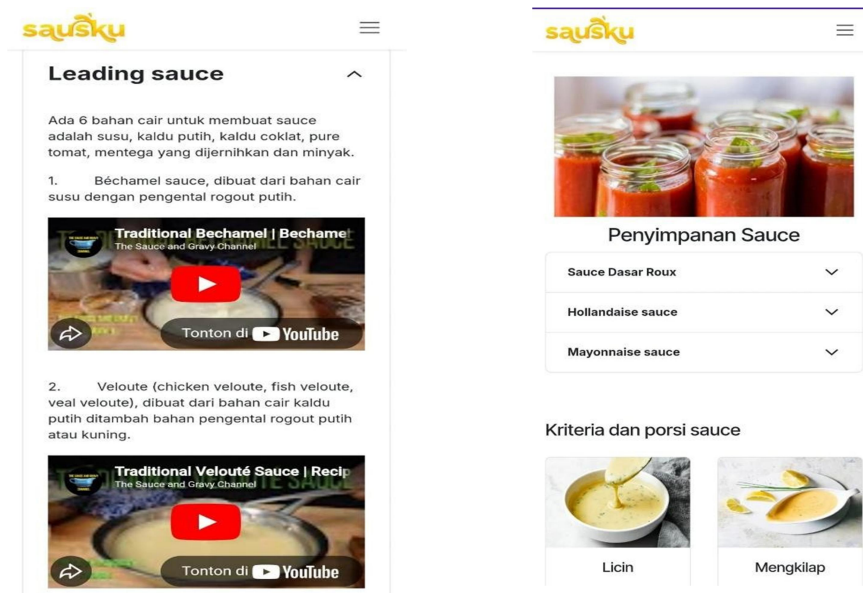
Figure 5. Featured Features in E-Module.

CONCLUSION

The Android Studio-based e-module developed has proven to be effective in increasing students' understanding of sauce material in the Continental Food course. Expert validation and student responses show that this media is very feasible to use as a digital learning innovation. Further research is suggested to expand the material, improve interface design, and conduct large-scale trials so that it can be widely implemented in various other culinary courses.

REFERENCES

Anas, S. (2011). Introduction to Educational Evaluation. Jakarta: PT Rajagrafindo Persada.

Andrianita, S. (2015). Development and Quality Analysis of E-Magazine Funeral Prayer Guide on Android-Based Cellphones. Thesis. FT UNY.

Branch, R. M. (2009). Instructional Design: The ADDIE Approach. Springer.

Darmawan, D. (2013). Learning Technology. Bandung: Remaja Rosdakarya.

Davidson-Shivers, G. V., Rasmussen, K. L., & Lowenthal, P. R. (2006). Web-Based Learning: Design, Implementation, and Evaluation. Pearson.

Dimyati, & Mudjiono. (2009). Learning and Learning. Jakarta: Rineka Cipta.

Moleong, L. J. (2010). Qualitative Research Methodology. Bandung: Remaja Rosda Karya.

Ozdamli, F. (2012). Basic elements and characteristics of mobile learning. Near East University Journal. Purbasari, R. J. (2013). Development of Android E-Magazine as a Mathematics Learning Media in Three-Dimensional Materials. Thesis. FMIPA UNY.

Rachman, H. A. (2014). Development of Android-Based Mobile Learning Media in Athletic Learning for Junior High School Students in Grade VII. Thesis. FMIPA UNY.

Safaat, N. H. (2012). Programming E-Magazine Mobile Smartphone and Tablet PC based on Android. Bandung: Informatics.

Sadiman, A. S. (2014). Educational Media. Jakarta: Rajawali Press.

Sugiyono. (2015). Research and Development Methods. Bandung: Alfabeta.

Styawan, S., Istiyati, S., & Hidayah, N. (2012). The Use of Video Media in Improving Understanding of the Concept of Natural Events. Journal of FKIP UNS, 2.

Sugiyono. (2015). Research and Development Methods. Bandung: Alfabeta.

Styawan, S., Istiyati, S., & Hidayah, N. (2012). The Use of Video Media in Improving Understanding of the Concept of Natural Events. Journal of FKIP UNS, 2.