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Development of Vocational Culinary Materials Using the Banabooku Application for Autistic Students

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Abstract. The objectives of this development research are: 1) Developing vocational culinary materials based on the Banabooku application for autistic students; 2) Analyzing the feasibility of vocational culinary materials based on the Banabooku application for autistic students; 3) Analyzing students' responses to Banabooku application-based vocational culinary material. This development research uses the ADDIE Model with 5 stages which include; 1) Analyzing the Independent Curriculum used in Special Schools; 2) Designing a material development concept map by the Independent Curriculum; 3) Developing material according to the concept map; 4) Testing the material that has been developed on students to analyze student responses; 5) Provide formative evaluations to students to determine the achievement of the learning objectives that have been formulated. The results of this research are: 1) Gluten and Casein Free Industrial Food and Beverage Materials based on the Banabooku application for autistic middle and high school students in Special Schools; 2) The feasibility of the Gluten and Casein Free Industrial Food and Beverage material on the Banabooku application received assessment results from material experts of 83.4% (very feasible), language experts 81.8% (very feasible), and media experts 86.2% (very feasible). worthy); 3) Student responses to the Gluten and Casein Free Industrial Food and Beverage material based on the Banabooku application obtained a result of 82.2% (very good).

Keywords: Material, Banabooku application, autism.

INTRODUCTION

Vocational education is education that produces work-ready graduates who have skills according to the needs of the world of work (Wardina et al., 2019). Vocational education is education that prepares the formation of skills, abilities, understanding, behavior, attitudes, work habits, and appreciation for the jobs needed by all people in the world of business or industry (Sukoco et al., 2019). The development of vocational education for children with special needs is one of the implementations of three independent curriculum structures oriented towards providing life skills which are the initial capital to face the world of work in the era of globalization, cultivating vocational skills to spur creativity and developing an understanding of the individual's role in social and cultural life (Rochjadi, 2016).

Vocational education programs at SLB have many types and are optional packages. One of them is vocational culinary material. Catering is knowledge of the art of preparing dishes which includes food and drinks, starting from processing preparation to serving traditional and international food and drinks (Siahaan, 2017). At the UM Laboratory Autism Special School, the culinary learning materials provided are cooking vegetables, frying eggs, boiling noodles and making salted eggs. Learning material is provided through material notes on the whiteboard which are then recorded by students in their notebooks, apart from that, learning material is also provided through learning videos, and the Google Classroom application as a medium for delivering material to students.

Vocational culinary learning in special schools needs to be given to autistic students by developing teaching materials. Teaching materials are the most important part of the overall learning process (Hamida et al., 2021). Teaching materials are seen as an important part of the learning process in the classroom, even in teaching activities that are focused on subject matter (subject-centered teaching) it can be stated that teaching materials are the core of a learning activity (Erianjoni, 2017). The development of teaching materials is necessary because it can help in the success of the learning process (Anggriani et al., 2022). The development of learning materials on vocational culinary materials in SLB is one form of improving the skills and competencies possessed by students to form a workforce that is ready for the world of work (Priambodo & Nuryanto, 2020).

Developing culinary learning materials for autistic students can utilize applications that can be accessed via Android. Android application-based learning materials are useful for supporting student learning activities. The characteristic of developing learning materials based on Android applications is that they have visual elements that display images that can improve the perception, understanding and memory of autistic students because they have very high memory in terms of visuals (Purwono et al., 2014). Developing learning materials for autistic students by utilizing Android-based applications, it is hoped that students will master the material well, have fun, and be able to repeat or study again and the material can be obtained anywhere and at any time (Izza et al., 2021), so that learning materials are based on Android in the form of an application can be easily controlled and accessed by users, namely autistic students.

METHOD

This research uses the ADDIE development model developed by Lee and Owens (2004) to design a learning system. The ADDIE development model is more appropriate and suitable for developing software-based learning materials, one of which is an application. In the ADDIE development model, there are five stages, namely: 1) Analysis; 2) Design; 3) Development ; 4) Implementation; and 5) Evaluation. The stages of the development model are carried out by **FIGURE 1**.

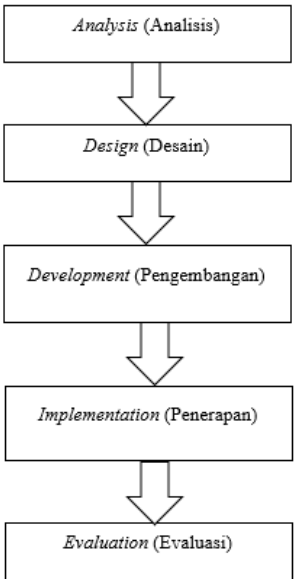

FIGURE 1. Stages of the ADDIE development model.

The following are the stages carried out in developing Banabooku application-based vocational culinary materials: 1) Analysis, namely the researcher carries out analysis through observation and interviews at the UM Laboratory Autism Special School. The analysis carried out is an analysis of the curriculum used in Special Schools (SLB), and an analysis of the material to determine the material that will be developed on an application basis; 2) Design, namely designing application-based material for smartphone users with the Android operating system. The development of this material is prepared with many images to support the material presented. The learning materials that will be

developed are material about gluten- and casein-free industrial foods and drinks specifically for children with autism; 3) Development, namely creating Android application-based material development products for autistic students at Special Schools. The stages of developing application-based material include preparing the material, taking pictures to support the material, and preparing the application as well as product validation carried out by material experts, language experts and media experts. This validation is carried out by filling out a questionnaire to find out the appropriateness level of the material, language and application media as well as get advice from experts to improve the quality of the product before it is tested on students; 4) Implementation, namely conducting product trials on middle and high school students with autism at the UM Laboratory Autism Special School. The product trial aims to determine student responses after using application-based material products and to test the suitability of the product according to student assessment through observation activities; 5) Evaluation, namely application-based material assessment which is carried out by giving formative evaluation questions to students. After carrying out the evaluation stage, research data is obtained. The data will be analyzed and conclusions drawn on whether the application-based material is suitable or not suitable for use in the learning process.

The data analysis technique used in this research is a quantitative descriptive analysis technique that describes the responses of the research subjects. Data analysis was carried out after obtaining data from all research subjects including material experts, language experts, media experts and students. Data analysis was carried out by converting the scores obtained from research subjects which were initially quantitative data into qualitative data using Likert scale rules as in **TABLE 1**.

TABLE 1. Likert Scale.

No.	Category	Score
1.	Very suitable	4
2.	In accordance	3
3.	It is not by	2
4.	Very Inappropriate	1

The scores obtained from the validation questionnaire of material experts, language experts, media experts, and students as users were then converted into four product suitability category scales which have score intervals in **TABLE 2**.

TABLE 2. Product eligibility category.

No.	Category	Score Intervals
1.	Very Worth It	76%-100%
2.	Worthy	51%-75%
3.	Decent Enough	26%-50%
4.	Not feasible	<25%

Source: (Fitri & Haryanti, 2020)

Then the scores obtained from observing student responses as users are converted into four user response category scales which have score intervals in **TABLE 3**.

TABLE 3. Student response categories.

No.	Category	Score Intervals
1.	Very good	76%-100%
2.	Good	51%-75%
3.	Pretty good	26%-50%
4.	Not good	<25%

Source: (Fitri & Haryanti, 2020)

The feasibility category scores in **TABLE 2** will be used as a guide to the assessment results from material experts, language experts and media experts. The student response category scores in Table 3 will be used as a guide for assessing students as users. These results will then show the level of feasibility of the application-based vocational culinary material being developed.

RESULT AND DISCUSION

The development of vocational culinary material entitled 'Gluten and Casein Free Industrial Food and Beverages' based on the Banabooku application for Special School students was carried out using the ADDIE development model, which consists of five stages, namely: 1) Analysis; 2) Design; 3) Development; 4) Implementation; and 5) Evaluation.

Analysis

At this stage, a needs analysis is carried out to obtain information related to the development of vocational culinary material. At this analysis stage, observations and interviews were carried out with teachers at the UM Laboratory Autism Special School. This analysis was carried out to obtain information regarding the curriculum used and vocational culinary material taught to SMPLB and SMALB students. Curriculum analysis aims to formulate learning objectives, and material analysis aims to formulate vocational culinary material that suits students' needs. Based on the results of observations and interviews with teachers at the UM Laboratory Autism Special School, it was found that the curriculum used in the school is the Merdeka Curriculum so all curriculum tools refer to the Merdeka Curriculum. Furthermore, the vocational culinary material taught to students is about cooking vegetables, frying eggs, boiling noodles and making salted eggs.

The analysis stage is the main activity in analyzing the need for material development. At this stage, an analysis of the basic problems faced in learning is carried out, identifying the main parts of the material to be taught and arranged systematically, as well as analyzing the abilities or competencies that students need to have (Cahyadi, 2019). The analysis stage is a process of defining what students will learn and identifying problems in learning (Trisiana & Wartoyo, 2016). In the development of learning materials, the analysis stage is carried out to first identify students, such as initial behavior relating to mastery and ability in the subject, as well as recognizing initial characteristics relating to information about students. If the introduction has been carried out, then material design can be carried out. and learning materials can be developed (Widyaningtyas & Sukmana, 2016).

Design

The design stage is the stage of designing the arrangement for developing vocational culinary material based on the Banabooku application. At this stage, this is done by creating a material development concept map which is an outline of the content of the material and collecting images and videos to support the material. The vocational culinary material developed was adopted from the Merdeka Curriculum for Culinary Subjects with elements of food and drink processing and the Learning Objective Flow (ATP) from Phase E, namely determining food/drink processing techniques according to recipes. The following is a concept map for developing vocational culinary materials based on the Banabooku application, which can be seen in **FIGURE 2**.

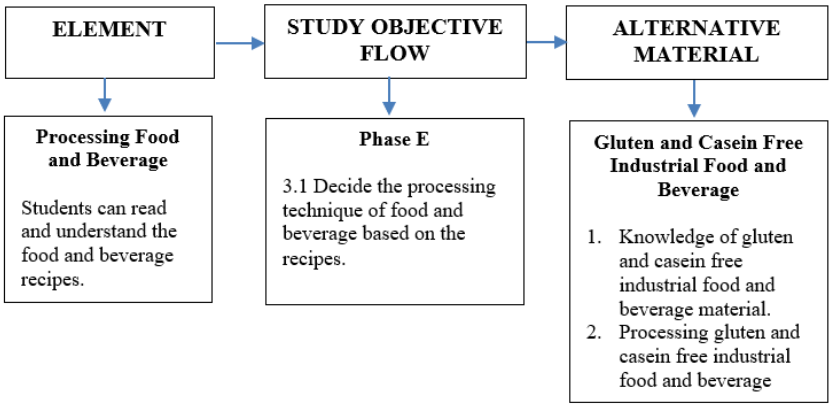

FIGURE 2. Material development concept map.

This design stage establishes a “monitoring line” for the progress of the next ADDIE stage (Hidayat & Nizar, 2021). In design activities or designing material development, five factors need to be considered, namely student characteristics, forms of learning activities, the context in which education is held, learning strategies, and tools for assessing student learning outcomes (S. Lestari, 2020).

Development

At this development stage, product development for vocational culinary materials based on the Banabooku application was carried out. The development of vocational culinary materials based on the Banabooku application was created based on a material development concept map that had been designed. The development of vocational culinary material with the title 'Food and Beverage Industry Free of Gluten and Casein' consists of two learning activities, namely, Knowledge of Food and Beverage Ingredients Free of Gluten and Casein, and Processing of Food and Beverages Free of Gluten and Casein. In each learning activity, there is an evaluation of learning activities for students which contains questions about matching pictures. The development of this material is also equipped with images and videos to support the material presented to students. The material that has been developed is then uploaded to the Banabooku application as learning media. The following displays the material based on the Banabooku application that has been developed, which can be seen in **FIGURE 3**.

FIGURE 3. Banabooku application-based material display.

The Development stage aims to produce and validate the learning resources being developed (Hidayat & Nizar, 2021). Development contains activities to realize product designs, in this case, teaching materials to achieve goals, namely producing and revising teaching materials that will be used to achieve the learning goals that have been formulated, and selecting the best teaching materials that will be used to achieve learning goals (Cahyadi, 2019).

After the material development stage is complete, product validation is then carried out by material experts, language experts and media experts to determine the level of appropriateness of the material, language and media and to get advice from experts to improve the quality of the product before being tested on students.

Material validation was carried out on October 3, 2023, by Mrs. Dr. Dra. Titi Mutiara Kiranawati M.P as Lecturer in Culinary Education, Faculty of Engineering, State University of Malang. The validation results obtained from the material expert assessment were 83.4% with a very feasible category. Validation from material experts includes aspects of material/content suitability (Elvina & Dewi, 2020). Aspects of material validation assessment include appropriateness of content, language, and material presentation (Sari et al., 2019).

Language validation was carried out on October 3, 2023, by Mrs. Bayu Siti Harini S.Pd as the UM Laboratory Autism SLB Vocational Teacher. The validation results obtained from the assessment of language experts as Vocational Teachers at the UM Laboratory Autism SLB were 75% in the appropriate category. Then language validation was also carried out on October 4 2023 by Mrs. Dewi Ariani, S.S., S.Pd., M.Pd as Lecturer in Indonesian Literature, Faculty of Letters, State University of Malang. The validation results obtained from the assessment of a

language expert as a Lecturer in Indonesian Literature, Faculty of Letters, State University of Malang were 81.8% in the very appropriate category. Aspects of language appropriateness include readability, clarity of information, material following good and correct Indonesian writing rules, and material using effective and efficient sentences (F. Lestari & Andriani, 2019). Material development must meet language assessment standards, use communicative language, and have criteria for continuity and integration of thought flow.

Media validation was carried out on October 4 2023 by Mr. Wahyu Nur Hidayat, M.Pd as Lecturer in Electrical and Informatics Engineering, Faculty of Engineering, State University of Malang. The validation results obtained from the media expert assessment were 86.2% with the very feasible category. Learning media that is designed with an attractive writing system, an attractive appearance with bright colors and images that support the material, as well as learning media that is easy to use will show a high level of validity (Wanabuliandari et al., 2021).

After validating the product, the product is then revised according to suggestions for improvements from the validators. The material expert validator provides suggestions, namely examples and images adapted to the subject matter, and considers Learning Activity 1 material according to the student's ability level. Suggestions for improvement given by the language expert validators were, improving the spelling used, especially punctuation, and adjusting word standards to the Kamus Besar Bahasa Indonesia (KBBI). Then suggestions for improvements given by media expert validators are, increasing the text size, adding images and videos according to needs and material, and adding a help menu or instructions for using the application.

Implementation

At this stage, material for the Gluten and Casein Free Industrial Food and Beverage Industry is implemented based on the Banabooku application which has been developed and revised. This application was carried out at the UM Laboratory Special School on October 17, 2023. The application of this material aims to determine students' responses to the Gluten and Casein Free Industrial Food and Beverage material based on the Banabooku application which has been developed to determine the suitability of the product. This implementation stage involved 18 students from SMPLB and SMALB levels. The application of Gluten and Casein Free Industrial Food and Beverage material based on the Banabooku application to students can be seen in **FIGURE 4**.

FIGURE 4. Application of material to autistic students.

At the application stage, students study the material for Learning Activity 1 which contains Knowledge of Gluten- and Casein-Free Food and Drink Ingredients, and then students study Learning Activity 2 which contains the Processing of Gluten-Free Food and Drink Ingredients.

When students studied the Gluten and Casein Free Industrial Food and Beverage material based on the Banabooku application, observations were made regarding the students' responses to the material that had been developed. The results of student responses obtained from observation activities received a score of 82.2% in the very good category, so the Gluten and Casein Free Industrial Food and Beverage material based on the Banabooku application is suitable for use in the culinary learning process at the UM Laboratory Autism Special School for SMPLB and SMPLB students. SMALB.

At this stage, the results of the development are applied in the learning process to determine its effect on the quality of learning which includes effectiveness, attractiveness and learning efficiency (Puspasari & Suryaningsih, 2019). In addition, the application of learning materials that have been developed aims to provide skills lessons to students,

namely generic skills consisting of personal skills, thinking skills and social skills, as well as providing specific skills consisting of academic skills and vocational skills (Jaya, 2016).

Evaluation

The evaluation stage was carried out to provide value for the development of Gluten and casein-free Industrial Food and Beverage material based on the Banabooku application. The evaluation was carried out by giving learning activity evaluation questions to students which consisted of two learning evaluations, namely Evaluation of Learning Activity 1 about matching pictures of gluten- and casein-free food and drink ingredients, and Evaluation of Learning Activity 2 about matching pictures of gluten- and casein-free food and drink. Evaluation of Learning Activity 1 consists of 6 questions and Evaluation of Learning Activity 2 consists of 5 questions. In the Evaluation of Learning Activities 1, students were able to do well and 10 students got the highest score, namely 100 because they could answer all the questions correctly, while the other 8 students got a score of 83 because they could answer 5 questions correctly. Furthermore, in the Evaluation of Learning Activities 2, students were able to do well and 17 students got the highest score, namely 100 for answering all the questions correctly, while 1 student got a score of 80 for answering 5 questions correctly.

Based on the results obtained from this evaluation, it can be concluded that students can learn and understand the Gluten and Casein Free Industrial Food and Beverage material based on the Banabooku application well and easily so that the material based on the Banabooku application can be used in the learning process. This is because the material taught uses application-based learning media which can display graphic illustrations, making it easier for autistic students to understand the learning material (Suri, 2016). Using applications as learning media can improve autistic students' ability to focus (Ajitama, 2023). This is also influenced by the learning patterns of autistic children, Visual learners, namely students easily understand and understand something they see, for example learning by using pictures and videos, and autistic children have very strong memory for things related to image objects (visual) (Mutia, 2011).

Evaluation is needed to determine the effectiveness of learning materials when used and evaluation is needed to improve the learning materials being developed to be better (Widyaningtyas & Sukmana, 2016). Evaluation of the development of teaching materials in learning aims to determine students' attitudes towards learning activities as a whole, the increase in student abilities which is the impact of participation in learning activities, and the benefits felt by the school as a result of increasing student competence through the development of teaching materials in learning (Cahyadi, 2019).

CONCLUSION

The development of Gluten and Casein Free Industrial Food and Beverage materials based on the Banabooku application for autistic students in Special Schools was carried out using the ADDIE Development Model which consists of 5 stages, namely: 1) Analyzing the Independent Curriculum used in SLB; 2) Designing a concept map for material development by the Independent Curriculum used; 3) Develop vocational culinary materials by the concept map; 4) Testing the material that has been developed on students; 5) Provide formative evaluations to students to determine the achievement of the learning objectives that have been formulated in the material. The results of the feasibility of the Gluten and Casein Free Industrial Food and Beverage material based on the Banabooku application by the material expert validator obtained a very feasible assessment, the language expert validator obtained a very feasible assessment, and the media expert validation obtained a very feasible assessment, and student responses to the Free Industrial Food and Beverage material The Gluten and Casein based Banabooku application received a very good assessment which was carried out through observation activities when students studied the material.

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