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Development of Practical Module in Bakery Courses at Food Science and Culinary Education Study Program

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Abstract

The practical module is one of the teaching materials, used as a guide for students. In this research, an easy, effective, and efficient practical module will be made so it can be used as a reference for practical bakery subject in Food Science and Culinary Education Study Program at UNNES. In this research we used R&D methods. With the development method developed by Thiagarajan, namely the four-D which consists of define, design, develop, and disseminate. The data collection technique was carried out by FGDs. Validation will be carried out through questionnaires to three material experts, media experts, which thoroughly documented. The analytical method used in this research were the aiken validity test and interrater reliability test using the ICC reliability. The results of the aiken validity test based on media experts were 0,84 with the criteria for a valid assessment having high validity. Meanwhile the results of the aiken validity test for material experts were 0,72 with the criteria for a valid assessment having moderate validity. The results of the media expert's ICC reliability test were 0,729, interpreted as the rater's agreement was moderate, and the results of the material expert ICC reliability test were 0,763, meaning that the rater agreement was good. The overall average value obtained identifies that the bakery practical module is "appropriate" to be used as a learning media because the overall average eligibility standard is categorized as "Good".

Keywords: Development, Practical Module, Bakery Courses

INTRODUCTION

Semarang State University has a Department of Family Welfare Education with several programs, one of them is the Food Science and Culinary Education Study Program. According to (Ulfah, 2013), culinary art is knowledge in the field of cooking (the art of cooking) which includes the scope of food, from the preparation to processing to serving the food itself, both traditional and international. In the Food Science and Culinary Education Study Program there is a bakery course. The processing bakery products according to (Syarbini, 2013) is only through roasting and baking. In general, bakery products are defined as a material that undergoes a heating and roasting process that causes changes in its shape and structure. Included in this group are steamed bread and donuts that undergo a heating process. It is important for a teaching staff to prepare every aspects of teaching and learning process in every courses properly. Teaching materials are made according to process standards with the aim of produce undergraduate which competent in various fields. This competence is possible to do through planning a predetermined learning process including the Semester Learning Plan (RPS).

The habit of using various kinds of teaching materials will make it easier to achieve the expected quality. Students have been given a teaching material that contains learning material to practice that will be carried out later. The teaching materials needs to be arranged coherently according to the order of competence to be achieved. Unfortunately, the teaching materials which available are all separated and need to be arranged properly.

According to research which conducted by (Rizky Khairani et al., 2016), in learning physics the teacher has provided the material presented, but in the practical implementation there are problems with the availability of guidebooks. The guidebook only explain the theory without including activity instructions so the students have difficulties carrying out activities. The observations showed that 84% of students stated that learning physics was difficult to understand and 97% of students preferred to use varieties of learning resources. Based on the results of these observations educators and students need a Physics practical module that fits their needs. The results showed that the Physics practical module which was validated by the material expert validator got 69.00%, media experts got 64.50%, and language experts got 93.00%. Based on these results, the media produced from this development research is categorized as "appropriate" to be used as one of the learning media.

According to (Anggraini et al., 2019) has conducted development research on the development of multimedia-based learning media in bakery courses. The research method used is R&D using the 4D (four-D) development method developed by S. Thiagarajan et al. Data collection techniques using observation and questionnaires. The results of this study produced a valid, practical, and effective module in the bakery course. The media validation was assessed by several validators, while media practicality testing activities were carried out by lecturers and students by filling out a questionnaire, and the media effectiveness test was carried out with the control class and the experimental class. The module was declared valid, namely 0.93 and 0.91 which categorized as very good, practical category with a value of 94.24% in the practical and effective category used as learning media for bakery courses.

According to (Amri et al., 2013), the use of learning media in the teaching and learning process can result interest, motivation, stimulate learning activities, and bring psychological influences on students. In addition to arousing student motivation and interest, instructional media can also help students improve understanding, to present data in an interesting way, also to facilitate interpretation of data and condense information.

One of the learning media we made in this research was practical module. Module according to (Yaumi, 2017), is a small unit of a learning that can operate itself. That is, the implementation of learning can run without the presence of the teacher face to face.

Lecturers for the bakery course already have teaching materials, here the researcher will only arrange those teaching materials into a unified whole called a module. In this research, a bakery practical module will be made and can be used as a reference during practice. The bakery practical module contains the kinds of practices that will be carried out later, and the last is the evaluation of the assessment. The contents of the material were taken from the RPS for the Food Science and Culinary Education Study Program at UNNES.

In making this bakery practical module, we will discuss bread as one of the processed bakery products. The material that will be taught in the bakery course program that applies to RPS UNNES Food Science and Culinary Education Study Program in 2021 includes:

1. Making white bread.
2. Sweet bread making.
3. Hot dogs/hamburgers making
4. Making danishes.
5. Croissant making.
6. Making egg twists.
7. Making cinnamon rolls.
8. Pizza making.

This practical module also aims to be a reference for bakery courses. Apart from being a reference for making practicum modules, it is also a development of available teaching materials without made any change relates to content and the achievement of the applicable competencies.

METHOD

This research is a Research and Development (R&D). The development model in this study is the 4-D (four-D) development model which consists of 4 stages namely; define (definition), design (design), develop (development), and disseminate (dissemination). This model was developed by S. Thiagarajan, Dorothy S. Semmel, and Melvyn I. Semmel in 1974. The data collection technique was carried out through questionnaires, documentation, and mini focus groups. The questionnaire is used to determine the feasibility of the practical module that has been made. The feasibility of the intended module is in terms of three material experts and three media experts. Documentation is used as supporting data were obtained from teaching materials and lesson plans. The mini focus groups are used to obtain information on the needs and completeness of the practicum modules that being made.

The feasibility quality of the practical module being determined by data analysis using the aiken validity test and the inter-rater reliability test. The Aiken validity test or Aiken's V is carried out to determine the validity of the contents of the instrument for each indicator and individual. According to (Azwar Saifuddin, 2012), Aiken's V is the result of an expert panel's assessment of an item in terms of the extent to which the item represents the construct being measured. The criteria for valid item items is to have a v index value ≥ 0.3, this was stated by Aiken where the formula that can be used is as follows:

$$V = \sum \frac{(r - lo)}{[n.(c-1)]}$$

explanation:

r : the score given by an evaluator
1o : lowest score (scale)
c : highest score (scale)
n : numbers of evaluator

Next, the reliability test between raters used is the reliability of Intraclass Correlat Coefficients (ICC). ICC is used to find out whether there is an agreement obtained from the raters/experts. From the ICC value, it will be known the feasibility quality of the bakery practicum module that will be made. Data collection uses an instrument using a Likert scale of 1 to 5. The formula used is based on as follows:

$$rxx = (Ss2 - Se2)/[\,Ss2+(k-1)Se2]$$

rxx = the reliability between rater
Ss2= variant between subject
Se2 = error variant
K= the numbers of rater
The coefficient criteria of reliability refers to (Guiseppe, 2018) as follows:

TABLE 1. Reliability Coefficient of ICC

ICC	Kriteria
< 0,50	Poor
0,50 – 0,75	Fair
0,75 – 0,90	Good
0,90 – 1	Excellent

(Giuseppe, 2018: 4)

RESULT AND DISCUSSION

The first stage, namely define, carried out a mini focus group discussion using the question and answer probling question method with Mrs. Dra. Rosidah, M. Si as a lecturer in the bakery

subject at the UNNES Food Science and Culinary Education Study Program as well as one of the material experts in the bakery field. Also Mr. Nur Budi Nugraha, S.Kom., MT as a lecturer in Indramayu State Polytechnic Informatics Engineering who is also as one of the media experts in making bakery practical modules. In this first defining stage, it begins with analyzing the problem, and continues with the formulation of objectives, media requirements specifications, and media development models. The results of the discussion resulted in three components of the bakery practical module, namely:

1. Opening section. Which consists of a cover, preface, instructions for using the module, practical rules, and competency maps.
2. The contents of the module. Which consists of introduction and creation.
3. Concluding section. Which consists of a glossary, bibliography, and attachments.

The second stage is design. In the design stage, there are three activities carried out, namely: first, the data compilation. In this activity, the researcher includes the 2021 UNNES Food Science and Culinary Education lesson planning which will be used as a reference for the sequence of materials in making the bakery practical module. The researcher's teaching materials also include material guidelines for making bakery practical modules. The second is media selection, namely printed media with the learning media model of the bakery practical module. Lastly, the initial design in this activity the researcher already has an initial product (prototype) or product design. The prototype has several types, one of the types that researchers use in this study is sketching or sketching. The following is a sketch of the initial product that the researcher made.

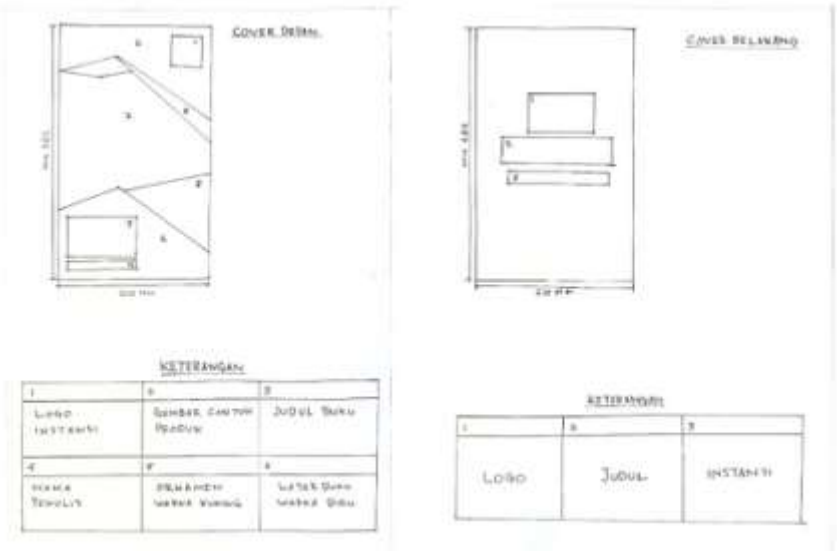

Figure 1. Sketch Of the Bakery Practical Module On The Front And Back Cover

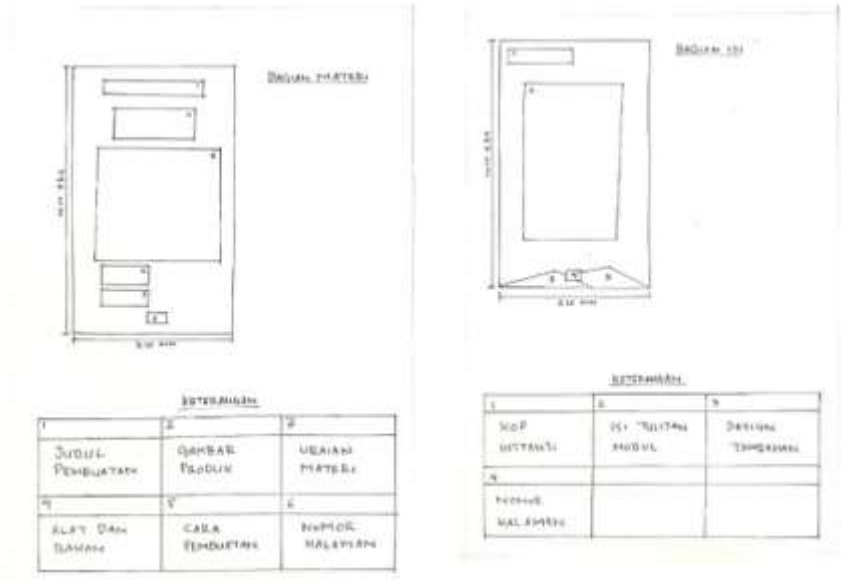

Figure 2. Sketch Of The Bakery Practical Module In The Material Section And The Contents Section

The third stage, namely develop (development) activities that have been carried out by researchers are as follows:

1) Module creation

In making the module the researcher already has a finished product from the bakery practical module. Designs made in accordance with the suggestions of directions and initial products that have been set. The parts of the bakery practicum module are as follows.

Figure 3. The Results Of The Bakery Practical Module Design On The Front And Back Cover

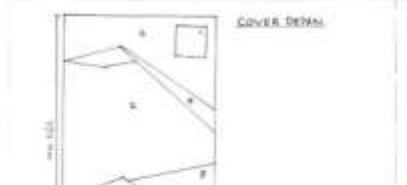

Figure 4. Results Of The Bakery Practical Module Design In The Material Section

Figure 5. Results Of The Bakery Practicum Module Design On The Contents

2) The Results of the Feasibility Test of the Bakery Practical Module by Media Experts and Material Experts

Based on the results of the instrument assessment that has been filled in by 6 expert validators with the number of instruments on media experts namely 3 variables, 9 indicators, and 33 question items. While the number of instruments for material experts is 3 variables, 9 indicators, and 21 question items. The result shown that the Aiken's V validity test values are as follows:

Table 1. Aiken's V validity test values

Evaluator	Aiken's V	Explanation
Media expert	0,84	High
Material expert	0,72	Average

Based on the table the results of Aiken's V assessment on media experts are 0.84, it means that all aspects of the assessment instrument questionnaire are valid and have high validity. While the results of Aiken's V assessment on material experts were 0.72, so all aspects of the assessment instrument questionnaire were valid and had moderate validity. The next step was testing the reliability between raters Intraclass Correlation Coefficients (ICC). The reason of usingg ICC was because the number of raters were more than two raters. ICC analysis shows the following results:

Table 2. Icc Reliability Test Results On Media Experts

Intraclass Correlation Coefficient

	Intraclass Correlation[b]	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	,473[a]	,267	,666	3,760	32	64	,000
Average Measures	,729[c]	,522	,857	3,760	32	64	,000

According to the reliability between raters Intraclass Correlation Coefficients (ICC), the reliability coefficient refers to Giuseppe (2018: 4) as follows:

Table 3. ICC Reliability Coefficient

ICC Value	Interpretation Reliability
0,00 - 0,50	Poor
0,50 - 0,75	Moderate
0,75 - 0,80	Good
0,90 - 1,00	Excellent

The results of the ICC calculation of 0.729 in table 2 compared to the ICC coefficient criteria in table 3, it can be said that the rater agreement is quite good (moderate) and the rater has good consistency. Referring to the results of the validity and reliability tests that have been carried out, it can be said that the assessment instrument has high content validity and has fairly good (moderate) inter-rater reliability.

The final stage is disseminate, at this stage the practical module had been distributed to experts, each of which consists of 3 material experts and 3 media experts. At this stage the activity were obtained, namely the result of design improvements made based on suggestions for improvements from experts. The suggestions and improvements from each expert have been briefly summarized by the researchers. In media experts, experts provide suggestions for improvement in the form of content, the proportion of the image, and using clear illustrations of each step of making bakery. Whereas the material experts provide suggestions for improvement to give better delivery of the contents of the practical material which must use clear and easy-to-understand sentences.

CONCLUSION

The design for the development of the bakery practical module was made by carrying out several stages, the first stage was define by means of mini focus groups. The second one was design which carried out by sketching. The third stage was development activities carried out by elaborating the results of the finished practical module product design and the results of the feasibility test from experts. The final step was dissemination, contains the results of the design improvements according to suggestions and improvements from experts.

The making of a practical module in the bakery subject at the UNNES Food Science and Culinary Education Study Program was declared feasible by experts to support the practicum process as a learning media. The result of the the assessment given by the material expert with a score of (0.763) in the (good/good) category, while the feasibility media expert obtained a score of (0.729) in the (moderate/good enough) category. Referring to these calculations, it can be concluded that this bakery practicum module is "appropriate" based on the criteria to be used as learning media. From

this evaluation it can be said that this bakery practicum module can support and be appropriate as a learning resource for students and lecturers supporting bakery courses in the practical course.
The module is expected to be a support for students as one of learning media, also become a reference for future researchers. In addition, hopefully there will be further research to improve the module to be revise or update thi physical physical form, content, also the design.

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