



# Android Based E-Module on Food Services Subjects for Culinary Students

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## ABSTRAK

Belum tersedianya media pembelajaran interaktif yaitu e-modul berdampak pada kurangnya minat dalam pembelajaran Food Services yang meliputi teori dan praktik di Program Studi Pendidikan Tata Boga sehingga mengakibatkan rendahnya hasil belajar. Penelitian ini bertujuan untuk mengembangkan e-modul berbasis Android pada mata pelajaran Food Services. Penelitian menggunakan model pengembangan 4D. Pengumpulan data dilakukan melalui wawancara dan kuesioner. Subjek penelitian adalah mahasiswa dan dosen Program Studi Pendidikan Tata Boga. Data dianalisis dengan menggunakan analisis deskriptif. E-modul yang dikembangkan terdiri atas tampilan depan (logo universitas, deskripsi e-modul, panduan, dan tombol start), dan menu utama (tujuan pembelajaran, isi, referensi, dan evaluasi). Hasil uji kelayakan e-modul yang dikembangkan menurut ahli materi, ahli media, dan siswa masing-masing sebesar 4,36 (sangat layak), 4,43 (sangat layak), dan 4,40 (akseptasi sangat tinggi). Data tersebut menunjukkan bahwa e-modul berbasis android sangat layak digunakan sebagai media pembelajaran. E-module berbasis android dapat mempermudah siswa dalam mengakses materi pembelajaran dimana saja dan kapan saja sehingga siswa dapat mengulang pembelajaran secara mandiri dan mampu meningkatkan pemahaman siswa terhadap materi pembelajaran.

## ABSTRACT

The unavailability of interactive learning media, namely e-modules, has resulted in reduced interest in learning Food Services which includes theory and practice in the Culinary Education Study Program, resulting in low learning outcomes. This research aims to develop an Android-based e-module for the Food Services subject. The research uses a 4D development model. Data collection was carried out through interviews and questionnaires. The research subjects were students and lecturers of the Culinary Education Study Program. Data were analyzed using descriptive analysis. The e-module developed consists of a front display (university logo, e-module description, guide, and start button), and a main menu (learning objectives, content, references, and evaluation). The results of the feasibility test for the e-module developed according to material experts, media experts and students were respectively 4.36 (very feasible), 4.43 (very feasible) and 4.40 (very high acceptance). This data shows that Android-based e-modules are very suitable for use as learning media. Android-based e-modules can make it easier for students to access learning materials anywhere and at any time so that students can repeat learning independently and are able to improve students' understanding of learning materials.

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## 1. INTRODUCTION

In the modern era of the 21<sup>st</sup> century, science and technology are developing very rapidly. This has had a significant impact in the field of education. Education is becoming increasingly important because students are required to have 21<sup>st</sup> century skills (Haryanti & Saputra, 2019; Kurniawan, 2019). Teachers play an important role in helping students develop 21<sup>st</sup> century skills by implementing methods that improve students' abilities. Teachers should have creative and innovative efforts, as well as prepare modern learning strategies, and utilize technology, so that they can increase student participation in learning (Alismail & McGuire, 2015; Cheng, 2018). Apart from that, teachers are required to use information and communication technology optimally. Continuous technological advances require continuous innovation in educational practices to remain relevant and effective (Mukaromah, 2020; Saniriati et al., 2021). This means that technology plays a very important role in improving the teaching and learning process and providing a positive influence on learning (Khusniyah & Hakim, 2019; Mardhiyyah et al., 2022; McKnight et al., 2016). The use of technology results in a relatively more significant increase in academic achievement. The integration of technology into learning has great effectiveness for teachers and students (Al-Hariri & Al-Hattami, 2017; Ghavifekr & Rosdy, 2015). Technology presents new ways of learning that do not require paper, such as e-learning, video conferencing, electronic books, and so on. This situation means that students must have computers, laptops, smartphones and other gadgets. The purpose of computers, laptops, smartphones and other learning tools is to make it easier for students to learn (Muqarrobin & Kuswanto, 2016;

Wirasmita et al., 2017). Therefore, the integration of technology and education can be realized through the use of learning media which continues to develop over time.

Learning media is part of the components that can influence learning. Media also functions effectively in learning contexts that take place without the presence of the teacher. One learning media that is easy to use is a module. Modules are media or learning tools that contain materials, methods, limitations of learning materials, instructions for learning activities, exercises and evaluation methods that are designed systematically and interestingly to achieve the expected competencies and are used independently (Abidin & Walida, 2017; Asrial et al., 2020). Modules as good media must be easy to operate, the instructions given are easy to understand and easy for students to respond (Husnulwati et al., 2019; Miftah, 2013).

As time went by, the module also developed into an electronic module. This development is used to encourage the development of independent learning using online or distance systems. E-modules are designed with software using a computer or electronic device as a reading medium (Seruni et al., 2020; Triwahyuningtyas et al., 2020). Electronic modules (e-modules) are the result of adaptations of printed modules or other teaching materials developed in digital (electronic) form (Elder et al., 2019; Hamzah & Mentari, 2017). E-modules can make it easier for students to learn, understand the material, and make learning interesting, interactive and efficient (Resita & Ertikanto, 2018; Savira et al., 2019). Students can repeat parts of the learning material to make it clearer and provide independent learning opportunities for students. Apart from that, students who have creative ideas will make them more comfortable in learning and understand the learning material more easily. Users of electronic modules can learn with or without a facilitator, teacher or lecturer. E-modules are preferably developed to overcome the weaknesses of printed modules which cannot be used to access videos, resulting in them being non-interactive and boring (Puspita et al., 2016; Rasmussen et al., 2020). E-modules have characteristics such as self-instruction, self-contained, stand alone, innovative, and user friendly,

Many researches have been done in the development of e-module for different subject for different level of education such as e-module for university students for entrepreneurship subject (Marvilianti & Sugihartini, 2020) and civil engineering (Ramadhan & Murtinugraha, 2020). In addition for Vocational High School level, some researchers developed e-modules for Clinical Dietetics (Rahmatunisa et al., 2022), Electricity and Electronics (Yurmansyah et al., 2022), and Graphic Design (Subastian & Astuti, 2021). Moreover, for Senior High School level (Syarlisjisman et al., 2021) developed Physics e-module. All of the results of the research showed the development of e-modules were valid and eligible to be used as learning media. However, there are still few researchers who develop culinary e-modules for universities, especially in food service courses. Food service is one of the subjects in the Culinary Education Study Program which is a science that studies the art of preparing, cooking and serving food. The learning process is usually carried out in classrooms for theoretical learning and laboratories for practice. There are still many learning activities in class that are still monotonous (Cemara & Sudana, 2019; Widiartini et al., 2019). This can be seen from learning which is only teacher-centered. In fact, culinary education is part of vocational education which must produce graduates who are ready to work and have skills according to job requirements. Therefore, prioritizing the preparation of workers who are ready to enter the world of work or industry with skills (Bakti & Gomo, 2017; Verawadina et al., 2019).

Based on the results of interviews with lecturers who teach food service courses, it is known that students prefer to use their smartphones to search for learning information. This can be seen when lecturers give assignments, students tend to look for assignments on the internet using their smartphones. The use of smartphones as a learning medium has been widely proven to be successful (Hanif, 2020; Hernández et al., 2017; Iksan & Saufian, 2017). Smartphone use can change a student's learning experience; provide a positive influence on learning; improve critical thinking skills; solving teaching problems; and independent learning (Aminatun et al., 2022; Sarrab et al., 2012). Therefore, the e-module was developed based on Android. Android was chosen because Google has made it the most widely used operating system throughout the world (Aminatun et al., 2022). Use of e-Android-based modules will make it easier for teachers to carry out the learning process and support the development of electronic learning media (Al Rasyid & Partana, 2021; Ricu & Najuah, 2020). Android-based e-modules have features that can support student learning both materially and practically (Afrianti & Qohar, 2019; Irawati & Setyadi, 2021; Masrurroh & Agustina, 2021). Using Android-based e-modules also makes it easier for students and teachers in offline and online learning.

The aim of this research is to develop an Android-based e-module for food services subjects for culinary students. This Android-based e-module is important to develop because there is no Android-based e-module that has the same learning objectives as the learning objectives set by the university. The e-module contains material consisting of theory and practice where the practice can be shown via video. Android-based e-modules were created to make it easier for students to access them. Not only can it be accessed via Windows but the E-module can be accessed via Android. Android-based e-modules can be used online as teaching materials that can make students active and not feel bored and also e-modules can be used during face-to-face learning as a companion to printed books that can be used when studying independently or at school. This research uses Kodular in e-module development where considerations for selecting Kodular software as an e-module format are (1) the number of

supporting tools available; (2) easy to use; (3) a format that is widely supported and includes audio, video and image features in the creation of e-modules. Apart from that, the advantages of the Android-based e-module in this research are (1) it is easy to access; (2) it does not take up too much quota; (3) it does not use memory storage; (4) it is easy to carry anywhere; (5) the absence of viruses and advertisements that interfere with the working of the E-module. Therefore, the development of an Android-based e-module in the Food Service course for students needs to be carried out

## 2. METHOD

This study employed a research and development (R&D) study. The procedure to develop an android based e-module about Food Services follows the 4D stages. The 4D model that consists of 4 stages, namely; define, design, develop, and disseminate (Thiagarajan, 1974). This study is limited to develop stage. Define stage is to determine and define the need of android based e-module for either students or lecturers in learning process. Then, design is to determine the media format, topic, and content in systematic way and is shown through story board. In development stage, the media is created based on the design that has been done then input the material through Kodular App. Next, the feasibility measurement was done by a media expert and a material expert and acceptability test by 20 students. The data were collected through interview and questionnaire. Interview was conducted to two lecturers of culinary study program of Universitas Negeri Medan to find out the need of android based e-module for Food Services subject. This study used two questionnaires. Firstly, closed-ended questionnaire is to analyze students' needs. Secondly, using questionnaire adapted from (Sriadhi et al., 2021) to measure the media validity by media and material experts. Also, acceptability test of the media was given to 20 students of culinary study program of Universitas Negeri Medan. The data were analyzed by using descriptive analysis to determine the need of media and to determine the media is feasible using data score conversion as show in Table 1.

**Table 1.** The Data Score Conversion of Material and Media Domain

No	Scores	Category
1	1.00 – 2.49	Not feasible
2	2.50 – 3.32	Less feasible
3	3.33 – 4.16	Feasible
4	4.17 – 5.00	Very feasible

**Table 2.** The Data Score Conversion of Media Acceptability

No	Scores	Category
1	1.00 – 2.49	Very low acceptability
2	2.50 – 3.32	Adequate acceptability
3	3.33 – 4.16	High acceptability
4	4.17 – 5.00	Very high acceptability

## 3. RESULT AND DISCUSSION

### Result

The define stage consisted of problem identification and need analysis which was used as a guide for media development. Based on the interview results, lecturers of Food Service subject used printed module as one of their learning sources. Moreover, the printed module had contents which did not represent the learning objectives of Food Services subject because there was a revised curriculum. One of important materials that had not added yet in printed module is flower arrangement for dining table. In addition, in this developed technology era, the printed module was not effective because students themselves had to dig information and tutorial from their smartphone. The unavailability of video to ease students in practicing the material in printed module led to the need of e-module. Therefore, this study developed Andorid-based e-module for Food Services subject for university students.

In designing stage, Canva was used to design the interface of every display of e-module. After that, Kodular was used to develop e-module so that it can be used in Android. Materials including texts, images, videos, and questions were all set first. The develop stage aimed at producing the e-module that suits the needs and feasibility standards. The develop stage consisted of 6 activities: collecting materials and questions related to learning objectives, taking pictures, recording videos, editing videos, creating the e-module using Kodular and doing feasibility measurement. The e-module results are displayed as in Figure 1,

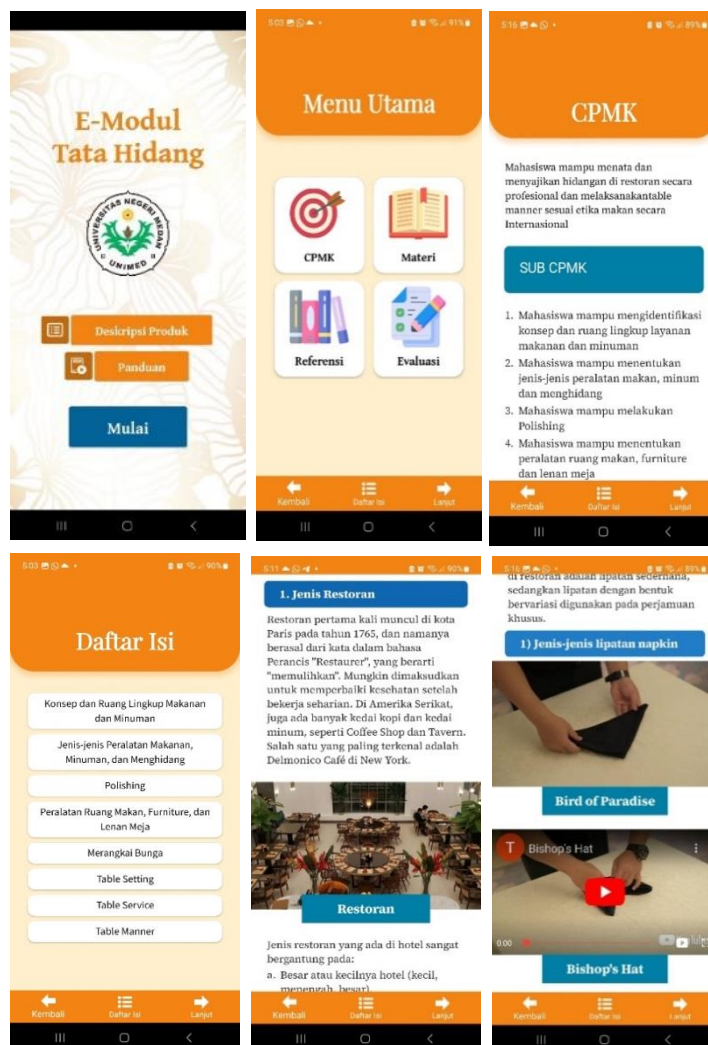


Figure 1. Android-Based E-Module Display

Base on Figure 1 show the front display consists of the title, university logo, description and guide buttons, and the start button. The main menu will appear when the start button is clicked. The main menu consists of options to open learning objectives, materials, references, and evaluations. The material is arranged together with images and videos. This interactive multimedia makes it easy for users to search for material they want to read or watch by clicking on one of the lists from the Table of Contents. If the user clicks the video button, the video will play itself and requires an internet connection. Whenever the user wants to return to the Table of Contents, simply click the middle orange button below. The media was then validated by two material experts and two media experts. Aspects assessed on material validation, namely: (1) Guidelines and information, (2) Multimedia Content/Material, and (3) Evaluation. The results of the assessment in the form of scores and suggestions are given on the assessment sheet. The results of the material expert validation are shown in Table 3.

Table 3. The Results of the Feasibility Assessment from the Material Experts

Aspect	Guidelines and information	Multimedia Content/Material	Evaluation	Total	Mean	Category
Expert 1	Scores	13	51	30	4.48	Very feasible
	Items	3	11	7		
Expert 2	Scores	13	49	29	4.33	Very feasible
	Items	3	11	7		
<b>Total score</b>		<b>26</b>	<b>100</b>	<b>59</b>	<b>185</b>	
<b>Mean</b>		<b>4.33</b>	<b>4.55</b>	<b>4.21</b>	<b>4.36</b>	
<b>Assessment Result</b>		<b>Very feasible</b>	<b>Very feasible</b>	<b>Very feasible</b>	<b>Very feasible</b>	



In Table 3, it is known that the average score given by expert 1 was 4.48 (very feasible), while expert 2 was 4.33 (very feasible). The calculation results from the two experts on each aspect began with material experts, namely guidance and information with 4.33, aspects of multimedia material with 4.55 and evaluation aspects with 4.21. Based on these results, the validation of every aspect as well as overall from the material experts for this media material was declared very feasible. The aspects assessed on media by two experts are (1) Guidelines and Information, (2) Program Performance, (3) Systematics, Aesthetics and Design Principles. The results of the media expert validation were shown in Table 4.

**Table 4.** The Results of the Feasibility Assessment from the Media Experts

Aspect	Guidelines and information	Program performance	Systematics, Aesthetics and Principles of Design	Total	Mean	Category
Expert 1	Scores	13	44	110	4.39	Very feasible
	Items	3	10	25		
Expert 2	Scores	13	45	115	4.55	Very feasible
	Items	3	10	25		
<b>Total score</b>	<b>26</b>	<b>89</b>	<b>225</b>		<b>340</b>	
<b>Mean</b>	<b>4.33</b>	<b>4.45</b>	<b>4.50</b>		<b>4.43</b>	
<b>Assessment Result</b>	<b>Very feasible</b>	<b>Very feasible</b>	<b>Very feasible</b>		<b>Very feasible</b>	

In Table 4, it is known that the average score given by expert 1 was 4.39 (very feasible), while expert 2 was 4.55 (very feasible). The average results by the two experts for each aspect began with guidance and information was 4.33, aspect of program performance was 4.45 and systematics, aesthetics and design principles was 4.5. Based on these results, the validation of media in every aspect as well as overall from media experts was declared very feasible. Acceptability assessment was carried out by 20 students. Aspects assessed include: (1) Guidelines and Information, (2) Multimedia Materials, (3) Evaluation, (4) Design and Facilities, and (5) Pedagogic Effects. The validation results are shown in Table 5.

**Table 5.** The Results of the Acceptability Assessment from the Students

No.	Aspect	Total score	Total items	Mean	Category
1	Information Guidelines	360	20 x 4	4.50	Very high acceptability
2	Multimedia materials	1050	20 x 12	4.38	Very high acceptability
3	Evaluation	350	20 x 4	4.38	Very high acceptability
4	Design and facility	870	20 x 10	4.35	Very high acceptability
5	Pedagogic effect	450	20 x 5	4.5	Very high acceptability
	<b>Result</b>	<b>3080</b>	<b>700</b>	<b>4.40</b>	<b>Very high acceptability</b>

In Table 5, it is known that the average score given by 20 students for each aspect was: (1) Guide and Information with 4.50, (2) Multimedia Materials with 4.38, (3) Evaluation with 4.38, (4) Design and Facilities with 4.35, and Pedagogical Effects with 4.5. The result of the overall assessment score for multimedia acceptability was 4.40 (very high acceptability).

## Discussion

The implementation of technology in education has progressed in the development of learning media. One of the media developed is an electronic module. E-module is a module that transforms it into electronic form (Diantari et al., 2018; Fatimah & Santiana, 2017). Learning media in the form of e-modules can be used as independent teaching materials containing videos, animations and audio which are presented in electronic form and connected via a link so that learning becomes interactive (Puspitasari, R. P., Sutarno, S., & Dasna, 2020; Yasa et al., 2018). E-modules can make it easier for students to study certain parts as desired (Azizah et al., 2022; Herawati & Muhtadi, 2018). Another advantage lies in the learning pattern which allows students to learn independently apart from that, the amount of teaching time can be reduced, and the learning process can be carried out anywhere and at any time by students independently (Noviyanita, 2019; Novrianti, 2018). The Android-based e-module was chosen because of the fact that many students use Android-based devices and the use of Android-based learning media is one of the applications of 21st century learning styles, so the e-module is expected to make it easier for students to learn (Kibirige & Teffo, 2014; Rini & Solehah, 2021).

This research uses a 4D development procedure which includes 4 stages, namely; define, design, develop, and deploy. The definition stage involves identifying problems and analyzing needs. Based on the results of

interviews with lecturers in the Food Service course, it was found that there is no Android-based learning media that can motivate students to learn and is in accordance with learning objectives. At the design stage, Canva was used to design each appearance of the e-module. After that, Kodular was used to develop e-modules so they could be used on Android. The front view of the e-module consists of the title, university logo, description and guide buttons, and the start button. In the main menu display, it will appear when the start button is clicked. The main menu consists of options to open learning objectives, materials, references, and evaluations. In the display the material is arranged together with images and videos.

The development stage consists of 6 activities, namely collecting materials and questions related to learning objectives, taking pictures, recording videos, editing videos, creating e-modules using Kodular and carrying out feasibility measurements. This research uses Kodular in e-module development where considerations for selecting Kodular software as an e-module format are (1) the number of supporting tools available; (2) easy to use; (3) a format that is widely supported and includes audio, video and image features in creating e-modules increases students' interest and ease in learning (Dames et al., 2019; Diantari et al., 2018; Wulandari et al., 2021). This is made clear by other findings that pictures and videos are useful for helping students who are slow in receiving and understanding lessons (Puspitasari et al., 2020; Tembang et al., 2017). Thus, the features contained in the Android-based e-module can support student learning both materially and practically (Irawati & Setyadi, 2021). The application of e-modules in the learning process can make learning conducive and effective because it contains features that can help students understand the material (Irawati & Setyadi, 2021; Romayanti et al., 2020).

The validation results of the e-module feasibility test developed according to material experts obtained a 4.36 very feasible category. The results of material validation are based on learning objectives, suitability of material, effectiveness and variations in information delivery (Suarsana & Mahayukti, 2013). The validation results by the media were 4.43 in the very feasible category. Validation results are based on the appearance of the e-book which is presented by considering color, font size, font style, design and layout so that it can be read well. Images and videos are of good quality so they are easier to learn (Pramana et al., 2020; Zicky et al., 2017). An attractive display can motivate students to learn. Validation results by students obtained 4.40 (very high acceptance. This response indicates that e-modules can motivate students to learn. Apart from that, the practicality of using E-modules is also able to increase students' enthusiasm for learning (Darmaji et al., 2019; Pertiwi, 2019).

This data shows that the Android-based e-module in food service learning is very suitable to be used as a learning medium. Android-based e-modules can make it easier for students to access online and online learning materials and can be done anywhere and at any time, so that students can repeat learning independently and are able to improve students' understanding of learning materials. This is in line with the research results of which stated that e-modules that have met material and media suitability standards are very practical and effective in improving learning outcomes (Ramadhani & Yudiono, 2020). Other research also states that Android-based e-modules are suitable for use in learning (Syahputra & Mustika, 2022). The use of electronic modules is very effective in increasing student learning motivation so that it can improve student learning outcomes.

The development of Android-based modules can increase the accessibility of learning materials for culinary students. They can access the material anytime and anywhere according to their needs. In addition, Android-based modules have the potential to be more interactive and interesting for students. The use of multimedia, simulations and other interactive features can increase interest in learning and understanding of the material. However, this research has limitations, one of the main limitations of using Android-based modules is limited access to technology. Not all students have access to an Android device or a stable internet connection, which may hinder their ability to use the module. Students who are less skilled in using technology may face difficulties in operating Android-based modules effectively. This can be an obstacle to using the module as a learning tool.

#### 4. CONCLUSION

This research produces a product in the form of an Android-based e-module on food service learning. E-module development uses the 4D development model. In developing the Android-based e-module using Kodular so that the e-module has many tools available, is easy to use and has a format that is widely supported and includes audio, video and image features. The e-module developed consists of a front display (university logo, e-module description, guide, and start button), and a main menu (learning objectives, content, references, and evaluation). The results of the e-module feasibility test developed by material experts, media experts and students show that the Android-based e-module is very suitable for use as a learning medium. The advantages of the Android-based e-module in this research are that it is easy to access, does not take up too much quota, does not use memory storage, is easy to carry everywhere, and there are no viruses and advertisements that interfere with the working of the E-module. Therefore, Android-based E-modules can be an additional learning medium for students so that they are easier to use in class and can be used as independent learning material at home. Android-based e-modules in food service learning are really needed by students and lecturers according to their needs.

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