Feasibility of Clinical Dietetics E-Module to Improve Learning Achievement of Vocational Students

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A R T I C L E I N F O

A B S T R A K

Tidak tersedianya media interaktif yaitu e-modul berdampak pada siswa sehingga cenderung pasif dan kurang berminat belajar pada mata pelajaran dietetik klinik sehingga mengakibatkan hasil belajar siswa yang tidak sesuai standar kompetensi. Penelitian ini bertujuan untuk mengembangkan dan membuktikan kelayakan e-modul dalam ilmu gizi dan menggali pentingnya pengembangan e-modul untuk meningkatkan prestasi belajar. Penelitian ini merupakan Penelitian dan Pengembangan (R&D) dengan menggunakan model 4-D dengan pendekatan kuantitatif. Subjek penelitian ini adalah siswa kelas X jurusan kuliner yang berjumlah 124 responden. Teknik pengumpulan data menggunakan wawancara dan kuesioner yang digunakan untuk memvalidasi dan membuktikan hasil kelayakan e-modul. Hasil validasi ahli materi menunjukkan bahwa e-modul sangat layak digunakan dengan persentase 91,250%, ahli media memberikan kontribusi kelayakan media 91,875%, sedangkan penilaian siswa mendapatkan kelayakan 86,618%. Sehingga e-module klinik dietetika layak untuk digunakan sebagai pembelajaran. Statistik parametrik dengan analisis komparatif dua sampel menggunakan uji T, Dunnet-C, dan uji Tukey dilakukan untuk mengetahui perbedaan variabel jenis kelamin, usia, dan kelas. Analisis komparatif membuktikan bahwa tidak ada perbedaan yang signifikan antara siswa kelas X kuliner dalam menilai perkembangan e-modul ilmu gizi. Adanya e-module klinik dietetik dapat memudahkan siswa dalam belajar dan melaksanakan pembelajaran secara mandiri sehingga hasil belajar siswa sesuai kompetensi.

A B S T R A C T

The unavailability of interactive media, namely e-module, has an impact on students so that they tend to be passive and less interested in learning in clinical dietetics subjects, resulting in student learning outcomes that are not by competency standards. This study aims to develop and prove the feasibility of e-modules in nutrition science and explore the importance of developing e-modules to improve learning achievement. This study is a Research and Development (R&D) using a 4-D model with a quantitative approach. The subjects of this study were students of class X majoring in culinary, which amounted to 124 respondents. The data collection technique used interviews and questionnaires that were used to validate and prove the results of the e-module feasibility. The results of material expert validation show that the e-module is very feasible to use with a percentage of 91.250%, media experts contribute to media eligibility 91.875%, while student assessments get 86.618% eligibility. So that the clinical dietetics e-module is feasible to be used as learning. Parametric statistics with comparative analysis of two samples using the T-test, Dunnet-C, and Tukey's test were conducted to determine differences in the variables of gender, age, and class. Comparative analysis proves that there is no significant difference between class X students in assessing the development of nutrition science e-modules. The existence of a clinical dietetics e-module can make it easier for students to learn and carry out learning independently so that student learning outcomes are according to competence.

1. INTRODUCTION

Along with the development of science and technology in the world of education, various renewal efforts are carried out by utilizing technology results in the teaching and learning process (Sleeman et al., 2019; Zhao et al., 2021). Activities to improve the teaching and learning process require teachers to make learning more innovative, interactive (Rahayu & Kuswanto, 2021; Vossen et al., 2020), motivation (Bani & Masruddin, 2021; Chiang & Lee, 2016; Gok, 2021; Kaiser et al., 2020; Shi et al., 2021), and encourage students to learn optimally (Amador et al., 2021; Ruiz-Mallén et al., 2021) in independent study as well as in the classroom. Education has an important role in improving the quality of human resources (Ayadat et al., 2020; Chiang &

Lee, 2016; Tayibnapis et al., 2018). The purpose of education can be achieved if the teaching and learning process is carried out well, a good teaching and learning process can be seen from the communication process between educators and students (Berić-Stojšić et al., 2020; Çınar et al., 2021; Grønlien et al., 2021; Lapitan et al., 2021).

Vocational education is part of the education system that prepares students to be able to work in certain fields (Daryono et al., 2021; Pratomo et al., 2020; Triyono et al., 2020). In secondary education units, Vocational High Schools (VHS) have a goal to improve intelligence (Coetzer et al., 2020; Han et al., 2015; Supriyadi et al., 2020), knowledge (Daryono, Yolando, et al., 2020; Habiyaremye, 2020; Wheelahan, 2015), personality, noble character, and skills (Beicht & Walden, 2019; Boonk et al., 2020) to live independently and attend further education in accordance with their profession (Daryono et al., 2021; Nurtanto et al., 2020). It is hoped that VHS graduates will be able to meet the demands of a competent workforce in order to increase productivity and efficiency and be able to compete in the international labor market in the era of globalization (Forum Económico Mundial, 2019; Saifurrahman et al., 2021; Tayibnapis et al., 2018).

Educators are required to be able to choose and apply learning media (Al-Qaysi et al., 2020; Marek et al., 2021), according to the material given to students. The use of learning media can enable students to be able to understand the material effectively and efficiently (Ketelhut, 2019; Yang et al., 2021). It is expected that with the use of the right media students can achieve maximum learning goals (Kugurakova et al., 2021; Willems et al., 2018), while efficiently it is expected that students can learn optimally without wasting time, money, and energy. The selection and application of the right media are expected to help the teaching and learning process activities (Joshi et al., 2020; Khtere & Yousef, 2021; Mikhaylovsky et al., 2021), one of which is in the subject of Nutrition. Nutrition science in the 2013 revised 2018 curriculum is one of the subjects taught in the culinary department, which aims to develop a productive and independent attitude in students by providing supporting theory and practical material.

The subject of nutrition science in the clinical dietetics menu is one of the subjects that must be taken by students in the culinary department. In the clinical dietetic menu learning process that has used the 2018 Curriculum, learning is carried out with students as learning centers. The teaching and learning process for the clinical dietetic menu is still ongoing at VHS 6 Yogyakarta, VHS 4 Yogyakarta, VHS 1 Sewon, based on the results of interviews and observations of educators still dominantly using conventional methods, namely lectures and still as the main learning resource due to the absence of other relevant learning resources and by the expected core and basic competencies. This causes students to rely on the role of educators so that there is almost no independent learning motivation due to the lack of other learning resources in the form of media that can help in the learning process of students. There are still very few teachers who apply media in the form of soft files in the form of e-modules, so many teachers use the classical method in the form of the lecture method (Daryono et al., 2021; Kusuma et al., 2021), especially on material for preparing clinical dietetic menus for Nutrition Science courses in the culinary department. There are adequate technological facilities, but there are teachers who use conventional media in the form of printed books and the lecture method becomes boring so that students lack motivation, interest, and interest in nutrition subjects.

The problems encountered in learning the clinical dietetic menu material that has used the 2018 Curriculum are the absence of printed learning resources or e-modules that can support learning and independent learning. These problems can be observed during the learning process both in the classroom, outside the classroom, and when observations have been made (Luthfi et al., 2021; Mateus & Hernández-Breña, 2019). During the observation activities, it was found that students only learn when given independent assignments, and students have difficulty in finding answers to the tasks given. Students are also confused because a lot of the material obtained from online media or other media is not by the rules and competencies that must be achieved (Fakhrunnisaa & Munadi, 2019; Kusuma et al., 2021). The results obtained from interviews with teachers who teach science subjects, there is a change in the syllabus regarding the preparation of clinical dietetic menus whose material coverage is broad and students will find it difficult to understand. The results obtained by students are not in line with the teacher's expectations because the average value obtained is only slightly different from the KKM limit. Therefore, to enrich the material that can be applied as a reference and facilitate the material presented by the teacher in the learning process, it is necessary to develop a teaching material that is to add or complement the material that has been delivered by the teacher (Huang & Hwang, 2019; Zimba et al., 2021). The limitations of learning media in science subjects for vocational students encourage it as a reference and guide for students (Daryono et al., 2021; Vossen et al., 2020).

This study aims to develop and prove the feasibility of e-modules in nutrition science and explore the importance of developing e-modules to improve learning achievement. The results of previous research which states that the development of e-modules is expected to be able to overcome problems in the teaching and learning process, that was developed contains theory, and assignments (Luthfi et al., 2021; Mateus & Hernández-Breña, 2019). So the development of this e-module is also expected to help complete learning materials independently, students can control their abilities, and the intensity of their learning and can learn anywhere

(Daryono et al., 2021; Fakhrunnisaa & Munadi, 2019; Kusuma et al., 2021; Luthfi et al., 2021). The clinical dietetics e-module that was developed contains theory, drawing steps, assignments, and evaluation of learning so that students can learn and evaluate the results of their studies. The existence of an e-module of clinical dietetics as a medium for learning nutrition subjects can be combined with learning at school, it is hoped that it will facilitate the process of understanding students' understanding of learning materials, improve learning achievement, and motivate students to learn independently. In connection with this, the author is interested in making an electronic learning e-module in nutrition science subjects in one of the subject competencies that are expected to help VHS students learn the material.

2. METHOD

This study is a Research and Development (R&D) using a 4-D model (define, design, development, and disseminate) (Nurdiansah et al., 2018; Sefriani et al., 2020) with a quantitative approach as shown in Figure 1. Define stage to identify and determine the basic problems faced in the learning process so that the background for the need for development. Student analysis, task analysis, and concept analysis are the targets for the development of learning tools. The second stage in the 4D model is designed. There are 4 steps that must be passed at this stage, namely the preparation of test standards, media selection, format selection, and initial design. The third stage is developed to produce a product development. This stage consists of two steps, namely expert assessment and development trials. The dissemination stage explains that the media can be implemented and used for students for learning process activities (Daryono et al., 2020; Luthfi et al., 2021).
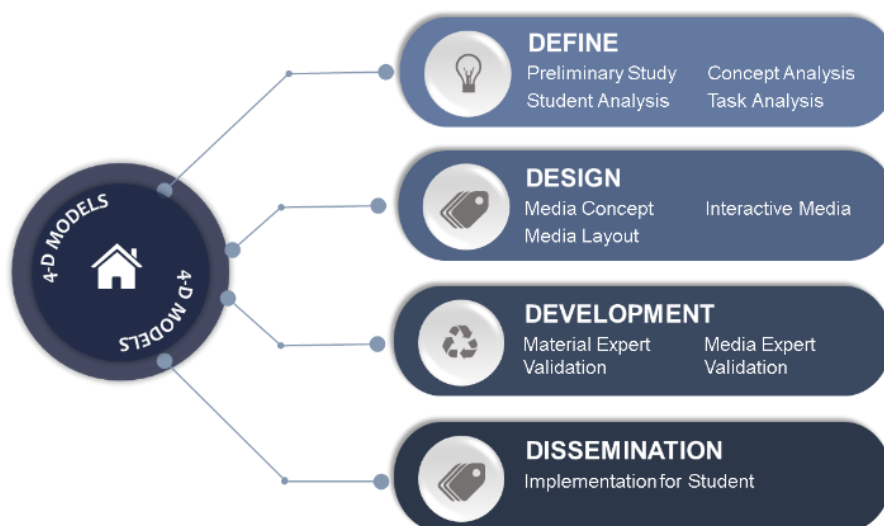

Figure 1. Development Design on Nutrition Science E-module

This research was conducted at VHS 6 Yogyakarta, VHS 4 Yogyakarta, and VHS 1 Sewon. The e-module material is focused on the material for preparing the clinical dietetic menu for the class X nutrition science subject in the culinary department. The number of students in this study amounted to 124 VHS respondents, while material and media expert respondents each amounted to 2 people. The characteristics of respondents in this study are presented in Table 1.

Table 1. Characteristics of Research Respondents

Dimension	Sub Dimension	Frequency	Total	Percentage
Gender	Male	30	124	24.194%
	Female	94		75.806%
Age Range	<15 years old	27	124	21.774%
	15-16 years old	80		64.516%
	>16 years old	17		13.710%
Class Subject VHS 6 Yogyakarta	Culinary 1	21	124	16.935%
	Culinary 2	20		16.129%
VHS 4 Yogyakarta	Culinary 3	22		17.742%

Dimension	Sub Dimension	Frequency	Total	Percentage
VHS 1 Sewon	Culinary 4	22		17.742%
	Culinary 5	20		16.129%
	Culinary 6	19		15.323%

The data collection technique e-module used in this study used a questionnaire (Daryono et al., 2021; Kusuma et al., 2021; Luthfi et al., 2021). The instrument consists of 4 alternative answers for material expert respondents, media experts, and students. The statement items on the material expert and media expert instrument amounted to 20 questions, while for the instrument students there were 18 questions 9 (in Table 2). This study is declared feasible if the clinical dietetics e-module is set at the minimum "Decent" criteria (Daryono & Rochmadi, 2020; Fakhrunnisaa & Munadi, 2019; Kusuma et al., 2021) which is shown in Table 3.

Table 2. Instrument Grid on Clinical Dietetics E-Module Assessment

Material Expert		Media Expert		Students	
Assessment Aspect	Items	Assessment Aspect	Items	Assessment Aspect	Items
Contex	1-8	Display	1-4	Theory	1-6
Language	9-12	Use and Understanding	5-9	Language	7-10
Service	13-16	Consistency	10-12	Graphic	11-14
Benefits	17-20	Format	13-15	Benefit	15-18
		Graphics	16-20		

Table 3. The Categorization of Feasibility Assessment on Nutrition Science E-module

Scale	Category	Percentage
4	Very Decent	>81.25% - 100%
3	Decent	>62.5% - 81.25%
2	Decent Enough	>43.75% - 62.5%
1	Not Decent	25% - 43.75%

The assessment of students' opinions regarding the importance of developing e-module is based on the average results of the two research variables. Parametric statistics use comparative analysis to determine the difference between two or more variables. In the age variable, t-$_{test}$ analysis is used to test the truth of the hypothesis proposed in differentiating the average in the two populations (Kusuma et al., 2021). The hypothesis on the t-$_{test}$ will be accepted if the t-$_{value}$ < t-$_{table}$, (Albahuoth, 2020; Arta et al., 2019; Razavipour et al., 2021) and the p-$_{value}$ (sig.) >0.05 (Berga et al., 2021; Okamoto et al., 2020; Rahayu & Kuswanto, 2021; Wozny et al., 2018) which states there is no difference of opinion or average results assessment of the two variables the importance of e-module development. A further test of ANOVA on the age range variable using Dunnet C test and class subject using Tukey's test. The hypothesis in the Dunnet C test and Tukey test will be accepted if the F-$_{value}$ < F-$_{table}$, and p (sig.) >0.05 (Çetin et al., 2020; Klibthong & Agbenyega, 2020; Opoku et al., 2020; Yan, 2018).

3. RESULT AND DISCUSSION

Result

The results of this study consist of 3 (three) sub-chapters discussing: (1) the results of developing e-modules in nutrition science subjects in the culinary department, (2) knowing the feasibility of developing e-modules by the assessment of material experts, media experts, and experts, students, and (3) what are the students' opinions about the importance of developing e-modules in nutrition science subjects for improving the learning process. The development of the E-module considers the analysis of student needs and the analysis of the needs of the e-module which includes basic competencies, reviewing the curriculum, and making the design of the e-module. Analysis of student needs is obtained from observations, observations of culinary students when learning nutrition science.

Needs analysis includes analysis of student needs, analysis of e-module needs which includes basic competencies, curriculum review, and making e-module designs. Based on the clinical dietetic material in the 2018 curriculum and the basic competencies used, the materials developed include Learning Activities I "General", Learning Activities II, and Learning Activities III. The Sub Material Learning Activities I "General" consists of 2 learning indicators, namely nutrition services for inpatients and outpatients, and guidelines for balanced nutrition. In Sub Material Learning Activities II consists of learning metrics ordinary food, soft food, filter food, and liquid food which includes clear liquid food, full liquid food, and thick liquid food. The Learning

Activities III sub-material consists of the high protein high energy diet, low energy diet, low salt diet, gastrointestinal disease diet which includes the upper gastrointestinal disease diet, lower gastrointestinal disease diet, then the diabetes mellitus diet which includes the diabetes mellitus diet without complications. diet for diabetes mellitus with nephropathy, and finally the diet for gout arthritis sub-study. This clinical dietetics material covers a lot of things, it must be delivered effectively and efficiently with limited time in class. So that the clinical dietetics e-module can function as a learning medium in teaching and learning activities in the science of nutrition subjects. This learning media product produces a clinical dietetics e-module prototype through the sigil application. The clinical ethics material is taken from the existing curriculum, competency standards, and basic competencies. The result of the material design used in the e-module of the dietetics clinic is the result of a discussion with a nutrition science teacher. The display of e-module development is shown in Figure 2.

Figure 2. The Sigil Software Work Page and E-module Cover

Feasibility testing was carried out by sending e-module files to experts and class X students majoring in cuisine. Implementation is by downloading applications that support reading e-modules in nutrition science subjects. Furthermore, material expert validation includes 4 (four) assessment aspects, namely: context, language, service, and benefits. Furthermore, the media expert instrument includes 5 (five) assessment aspects, namely: display, use and understanding, consistency, format, and graphics. This material and media expert validation provides an assessment of the clinical dietetics e-module covering various aspects. Feasibility data by material experts and media experts containing assessments, suggestions and comments on the instruments provided. The assessment of material experts and media experts consisted of 2 respondents who mastered the field of nutrition science. The results of the evaluation of the nutritional science e-module media validation are shown in Figures 3 and 4.
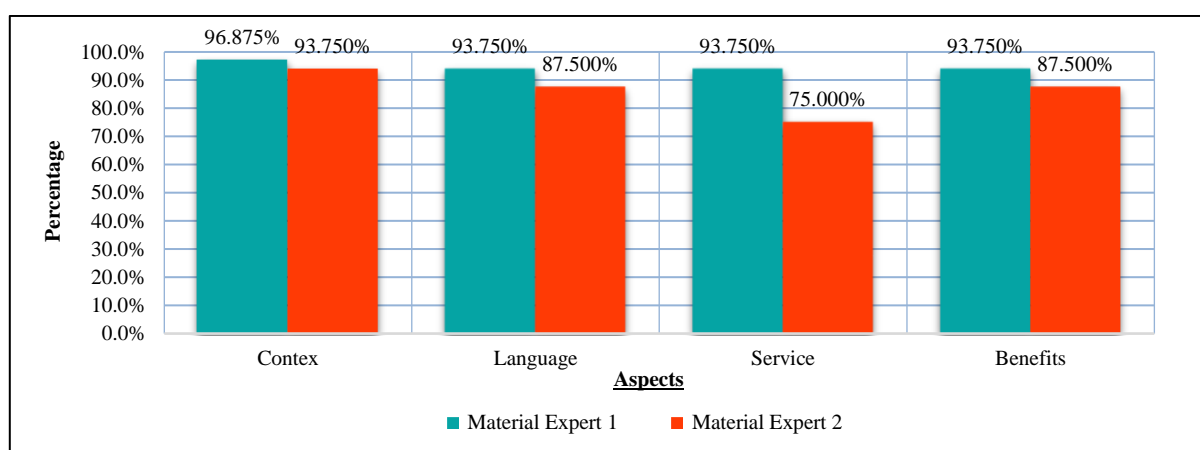

Figure 3. Validation of Material Experts on the Nutrition Science E-module

From the assessment of 4 aspects consisting of 20 questions on the material expert instrument, the maximum score is 4. The two material experts each gave a total score of 76 and 70 so that an overall score of 146 was obtained from a total score of 160. The feasibility assessment of the development of the e-module dominates the context aspect with an average percentage of 95.313%, while the lowest percentage is 84.375% in

the service aspect. With an overall percentage of 91.250% on the results of the e-module assessment by material experts, the clinical dietetics e-module is included in the "very feasible" category by material experts.
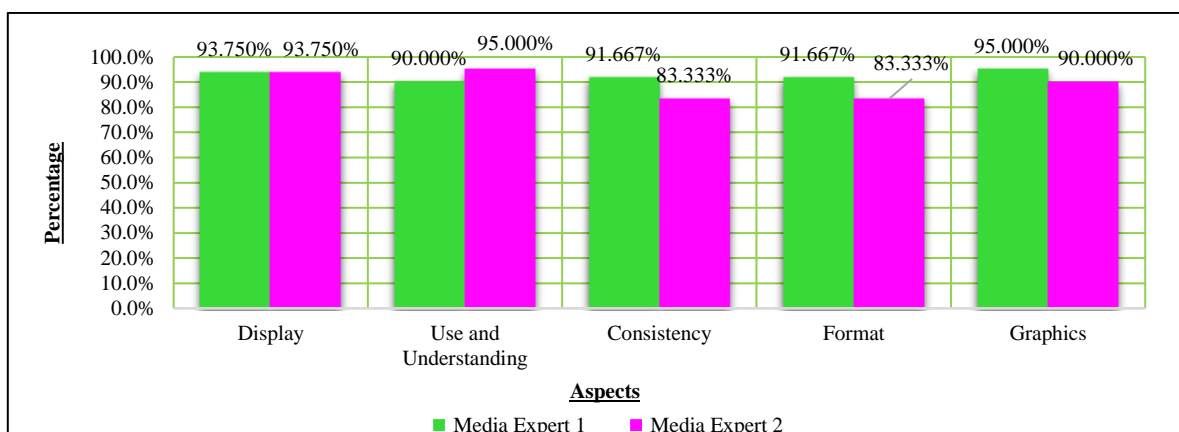

Figure 4. The Validation of Material Experts on the Nutrition Science E- module

The assessment includes 5 aspects consisting of 20 questions on the media expert instrument, with a maximum score of 4. The two media experts each giving a total score of 75 and 72 so that an overall score of 147 is obtained from a total score of 160. Assessment of the feasibility of developing an e-module dominates the display aspect with an average percentage of 95.00%, while the lowest percentage is 87.500% in the consistency and media format aspects. With an overall percentage of 91.875% on the results of the e-module assessment by media experts, the clinical dietetics e-module is included in the "very feasible" category by media experts. Testing the feasibility of developing an e-module based on the assessment of class X students in the culinary department consists of 18 statements. The assessment aspect consists of material, language, graphics, and useful aspects. The results of the nutritional science e-module media validation assessment by students are shown in Figure 5.
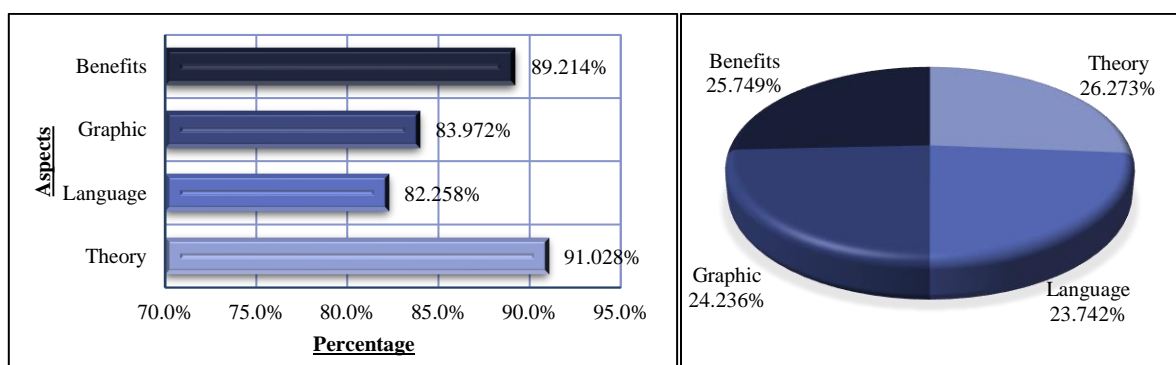

Figure 5. The results of the nutritional science e-module media validation assessment by students

From the assessment of 4 aspects consisting of 18 questions on the student assessment instrument, the maximum score is 4 and the lowest is 1. The number of students in assessing is 124 respondents. The average percentage on the aspects of the material, language, graphics, and benefits respectively are 91.028%, 82.258%, 83.972%, and 89.214%. The assessment of the feasibility of developing an e-module that dominates is in the material aspect, while the lowest percentage is in the media language aspect. With an overall percentage of 86.618% on the results of the e-module assessment by students, the clinical dietetics e-module is included in the "very feasible" category. After the development of the e-module, product validation was carried out to material and media experts, as well as class X students majoring in Food, with a very adequate level of feasibility, then a parametric statistical test was carried out with a comparative analysis of two samples. Comparative analysis was conducted to determine the difference of opinion of the two data variables. The first test in the comparative analysis is the t-test which is applied to the gender variable on the research respondents in class X of the culinary department using the t-test. The results of the t-test on the gender variable shows that the two groups have 30 male respondents and 94 female respondents respectively so that the total is 124 respondents. Students' assessment of the urgency of e-module development obtained an average of 3.466 and 3.490 from a maximum

score of 4.00. This shows that students' opinions on the development of e-modules are very important to be implemented in the learning process. Then to see if there is a significant difference in research on the 2 indicators on the gender variable, see the column Sig. (2-tailed) and t-table. Value of Sig. (2-tailed) 0.268 (α >0.05) and the t_{value} obtained a value of 0.444 (<t_{table} = 1.97960; df 122). It can be concluded that if the opinions of male and female students in assessing the urgency of developing e-modules in nutrition science subjects, there is no difference.

Dunnet C test shows that the variable age range consists of 3 indicators, namely <15 y.o., 15-16 y.o., >16 y.o. Students' assessment of the urgency of e-module development obtained an average of 3.458, 3.468, and 3.598 from a maximum score of 4.00. Then to see if there are significant differences in research on the 3 indicators in the age range variable, look at the Sig column. (2-tailed) and F_{table} values. Value of Sig. (2-tailed) 2.078 (alpha >0.05) and F_{value} obtained a value of 0.130 (<F_{table} = 3.07; df 2:121). It can be concluded that if the opinions of students with different types of age in assessing the urgency of developing e-modules in nutrition science subjects, there is no difference. The results of the Tukey test in Table 4 show that the age range variable consists of 6 indicators, namely Culinary 1-6. Then to see if there are significant differences in research on 6 indicators on the subject class variable, see the column Sig. (2-tailed) and F_{table} values. Value of Sig. (2-tailed) 1.140 (alpha >0.05) and the F_{value} obtained a value of 0.130 (<F_{table} = 2.29; df 5:118). It can be concluded that if the opinions of students with different types of subject class in assessing the urgency of developing e-modules in nutrition science subjects, there is no difference.

Table 4. Tukey's test on the Subject Class Variable

| | | | Statistic Descriptives | | One-Way ANOVA | | |
	Subject Class	N	Mean, α = 0.05	X̄	F	Sig.	Inter-group differences
Tukey HSD[a,b]	Culinary 1	21	3.457	0.071	1.140	0.343	Mean Sample Size = 20.607
	Culinary 2	20	3.427				
	Culinary 3	22	3.474				
	Culinary 4	22	3.437				
	Culinary 5	20	3.569				
	Culinary 6	19	3.549				

Discussion

This study uses the 4-D development model, through a limited trial with 4 stages, namely define, design, development, and dissemination. The define stages include identifying needs and formulating prototypes of clinical dietetics e-modules, designing clinical dietetics e-modules, and development including validation of clinical dietetics e-modules through material and media expert tests, readability tests, and student opinions. The first stage begins with identifying the needs and prototypes of the e-module. Second, designing, at this stage there are several other obstacles, namely in determining the concept, editing, preparation of material, which will be developed because it is not the expertise of the developer. The next step is that the clinical dietetics e-module is distributed to subject teachers and students. Teachers and students are guided on how to operate and use the clinical dietetics e-module. This clinical dietetics e-module makes it easy to provide material to students and students can study first before the teacher delivers the material in class. This research is in line with the research who have succeeded in developing the concept of learning media using a 4-D model to support the learning process of vocational education students (Daryono et al., 2021; Luthfi et al., 2021).

The validation test on the development of e-module by material experts obtained an average of 91.250%, media experts obtained a score of 91.875%. Some suggestions and inputs from material and media experts about media development were the module position map, the question writing could be improved, the instructional media sentences were replaced with e-module sentences, used good fonts and colors, then added some supporting videos. All inputs and comments from material and media experts have been corrected before the development of the e-module was piloted to class X students in the culinary department. This study is in line with the results of research in the success of descriptive analysis to determine the alternative categorization of the feasibility of media development for material experts and media experts (Fakhrunnisaa & Munadi, 2019; Kusuma et al., 2021; Sleeman et al., 2019). The researcher's follow-up was to re-refining the clinical dietetics e-module. Suggestions for validation of media experts are changing the module position map, writing questions to be corrected, and changing the sentences of learning media into e-modules. The researcher's follow-up was to improve the module position map by adding a column for basic competence in nutrition science subjects and improving writing according to the guidelines. Expert validation advice is to add learning videos, improve fonts and colors. The follow-up of the researchers was to add videos about food for patients, improve the font with Times New Roman with sizes 12 and 14, and the writing color to blue and yellow.

The media feasibility test was carried out with 124 culinary students X totaling 124 students. There are 4 aspects used for media feasibility, namely material aspects, language, graphics, and benefits. While the implementation of the media to students obtained an average value of 86.618%. Of the several components in the instrument that were assessed for the feasibility of the media that gave the largest contribution, namely the clarity of the instructions for filling out, the ease of understanding the language used, the ease of reading, the display format used, the ease of answering, the ease of understanding the terms used, the suitability of the statement with the answer choices. available, and avoid pressure, feelings of fear, and shame in answering. It can be concluded that the development of e-module media on nutrition science subjects is in a very feasible category to be implemented in the learning process in class X of the culinary departmentThe results of this assessment agree with the results of research which states that good media development results at least >62.5% (Daryono et al., 2021; Kusuma et al., 2021; Luthfi et al., 2021).

The t-test, Dunnet C, and Tukey test concluded that there was no significant difference between class X students majoring in Cuisine on gender, age range, and subject class differences in assessing the development of e-modules in nutrition science subjects. This shows that students' opinions on the development of e-modules are very important to be implemented in the learning process. This is evidenced in the results of the average value acquisition at the level of urgency for e-module development which is above 3.40. This research is in line with the research success in applying parametric statistical tests with the comparative analysis used to find out differences in student opinions with the results of the average score (Alnahdi, 2020; Çetin et al., 2020; Klibthong & Agbenyega, 2020; Opoku et al., 2020; Razavipour et al., 2021; Yan, 2018). In general, the clinical dietetics e-module developed has advantages in terms of practicality, can be studied anywhere, is easy to carry, can be run on a smartphone or laptop without an internet connection. Although there are advantages, this clinical dietetics e-module has a drawback, namely the size of the file so that the loading process opens the page. The advantage contained in the clinical dietetics e-module is that it is considered worthy to be studied and as a learning medium that is applied to nutrition science subjects. The clinical dietetics e-module is one of the alternative efforts to help teaching and learning activities for students in nutrition science in class X in the department of culinary. Therefore, this research needs to be followed up with other researchers to find out and improve in the future.

4. CONCLUSION

The results of material expert, media experts, and students validation show that the clinical dietetics e-module is feasible to use. So that it can be interpreted that the clinical dietetics e-module is suitable for use as a learning medium. The results of the assessment revealed that the development of e-module was very important for the learning process. Based on these conclusions, the implications of this study are the development of clinical dietetics e-modules to make it easier for students to learn, carry out independent learning that is appropriate, understand the material without being hindered by space and time, understand the language and terms used and interesting learning media so that students get learning outcomes. The clinical dietetics e-module is said to be suitable for use after going through validation tests by material experts, media experts, and testing for class X students in the culinary department. The clinical dietetics e-module is effective and attractive as a learning medium for nutrition subjects at vocational high schools. The implication is that with the clinical dietetics e-module, not only students can use the media, but the general public can also use it.

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