



English E-module Based on Mind Mapping to Enhance Student Achievement: A Study on Seventh Grade

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ABSTRAK

Model pembelajaran yang diterapkan saat ini masih menggunakan metode konvensional. Padahal peserta didik jaman sekarang adalah mereka yang lahir dan hidup di era perkembangan teknologi, artinya mereka merupakan generasi Gen-Z. Oleh karena itu, penelitian ini bertujuan untuk mengembangkan sebuah e-modul bahasa Inggris berbasis mind mapping yang sesuai dengan kebutuhan siswa untuk meningkatkan pemahaman mereka pada pelajaran bahasa Inggris. Metode penelitian mengacu pada Research and Development dengan menggunakan pengembangan model 4D. Partisipan dalam penelitian ini merupakan siswa kelas VII. Teknik pengumpulan data dilakukan dengan cara observasi, kuesioner, dan wawancara. Teknik analisis data menggunakan analisis deskriptif kualitatif dan kuantitatif. Hasil penelitian menunjukkan bahwa produk e-modul bahasa Inggris mendapat skor 4,00 dari ahli materi, dan skor 3,60 dari ahli media, yang berarti produk ini layak untuk digunakan. E-module bahasa Inggris ini juga telah diujicobakan kepada siswa, dan terbukti dapat meningkatkan pemahaman mereka dalam belajar bahasa Inggris melalui nilai rata-rata mereka yang mencapai 89. Dengan demikian, keberadaan e-modul bahasa Inggris ini memberikan manfaat dalam model pembelajaran bahasa Inggris berbasis teknologi bagi Generasi Gen-Z karena keefektifan dan kepraktisannya.

ABSTRACT

The learning model applied today still uses conventional methods. Whereas today's students are those born and lived in the era of technological development, meaning they are the Gen-Z generation. Therefore, this study aims to develop a mind mapping-based English e-module that suits students' needs to improve their understanding of English lessons. The research method refers to Research and Development using 4D model development. Participants in this study were class VII students. Data collection techniques were carried out using observation, questionnaires, and interviews. Data analysis techniques using qualitative and quantitative descriptive analysis. The results showed that the English e-module product received a score of 4.00 from the material expert and a score of 3.60 from the media expert, which means that this product is feasible to use. This English e-module has also been tested on students and is proven to increase their understanding of learning English through their average score of 89. Thus, this English e-module provides benefits in an English-based learning model. Technology for Generation Z because of its effectiveness and practicality.

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1. INTRODUCTION

Media has become a crucial thing in the learning process nowadays because it is a device or equipment for helping teachers to deliver learning materials to students. The example of learning media are the teaching aids, teaching props, and learning resources (Puspitarini & Hanif, 2019; Putra et al., 2020; Sondakh et al., 2021). Learning media is all things the teacher utilizes as a medium or a link to convey information or messages to students so they will be motivated to follow the whole learning process (Hasan et al., 2021; Laksmi & Suniasih, 2021; Permatasari et al., 2019). The learning media also has two characteristics; nontechnological based media or the real objects such as book, module, etc and technological based media such as computer system, e-book, e-module (Perdana et al., 2017; Prasasti et al., 2019; Syahrial et al., 2021). Module and electronic modules (e-modules) are the learning resources containing complete and clear information, and easy-to-understand language that students can use for independent learning (Khusnul et al., 2022; Mauliana et al., 2022). The advantages of using e-module as a learning resource are increasing students' persistence when studying independently, developing critical thinking, helping them to solve a problem in the learning process, as well as enhancing students' creativity when they learn independently (Evenddy et al., 2021; Serevina et al., 2018).

The researchers expect the advantages of the mind mapping module can give an innovative learning source for teachers and students, especially in teaching and learning economic lessons (Hidayati et al., 2021).

Other research proved that e-module can be the solution for overcoming teachers' and students' current problems in the situation of pandemic COVID-19 (Trilestari & Almunawaroh, 2021). E-module is one of the media that can help teachers assess students' assignments because this application provides ESP material and the evaluation of each material that can improve students' ability in English (Dewi et al., 2019). Those three studies before, have their own excellences such as; the first study designs a mind mapping on the economics learning material. In the second study, the excellence exists in the evidence that e-module can assist teachers and students solve problems in online learning. The advantage of the third study is the design and development of computer application-based e-module. There are three points of those previous studies that missing, and they will be completed in this study. First, the result product of the initial previous study was module. Second previous study only describe the advantage of using e-module, not generate the product. The last study produces an e-module but it is only for computer. Thus, this research is combining the three deficiency on the previous studies that designing and developing an e-module of English materials formulated in the form of mind mapping, and it can be accessed in students' smartphone without spending the internet quotas.

Based on pre-observation through classroom activity and teacher interviewing conducted in MTs Al-Yusra of Gorontalo, researcher wanted to see the condition and problem in classroom activity especially the use of learning media. Since the classroom observation, the students were still less interest in studying English because it could be seen from their response on teacher's instructions. They did not enthusiast in learning process because the way of teacher explaining the material used speech method or conventional method. On the interview, the teacher stated that each material's content in the English textbook was still too general and contains language that was difficult for students to understand. Also, the material explanation in the textbook was full English, and students had to translate word for word to understand it well. In fact, most of the seventh-grade students in MTs Al-Yusra had never studied English before, whether in elementary school or in the English course. That is why English is something new for them. Sometimes teacher preferred sharing the internet links contain the explanations of related English material through WhatsApp group of class. The teacher thought that the material explanation on the internet link would be easier for students to understand than reading the material in English textbooks. Besides, teacher stated on the interviewing that the learning media such as LCD needs to be facilitated to support her in explaining English material easily and interactively. Occasionally, a teacher created the explanation of English materials on carton and appeared it in front of the classroom to ease students in understanding the material.

Thus, based on this situation, the researcher decides to create a simple learning media that can help students in understanding the English material without translating word for word and reading a long explanation on the textbook. Mind mapping will be developed to make them easier to get information and understand the English material. Mind mapping was chosen because it can make students easier to understand the learning material without having to read a long and complicated explanations on textbook (Astuti et al., 2013; Ulya et al., 2019). In mind mapping, the material will be presented more attractive and simpler (Pratama et al., 2020; Zahro et al., 2018b). Also, students do not need to find the meaning of every word in dictionary due to the material explanation display through pictures and color variations so it can attract students' attention to learn English. The whole English materials in mind mapping form will be united into an electronic module application to facilitate students access each material of English through their smartphone.

Mind mapping is a method or technique that incorporates the brain's right and left hemispheres in receiving and understanding various information into and out of the human brain (Dewi et al., 2020; Lubis et al., 2019; Masliani et al., 2019; Zahro et al., 2018a). Combining the right and left hemisphere work simultaneously will help humans to organize and manage incoming information, so that information will be convenient to remember. The work system of the right and left hemispheres assists humans in remembering the input information without memorizing it because the function of the left hemisphere and right hemisphere complement each other (Lubis et al., 2019; Masliani et al., 2019; Oktavia et al., 2016). For instance, the left hemisphere organizes critical analytics, logic, number, language, and lists, while the right hemisphere organizes rhythm, color, shape, creativity, and imagination (Sulistiyono et al., 2017; Widiari et al., 2014). Therefore, combining both functions of hemispheres in the mind mapping concept gives a massive advantage for humans or students in learning. It happens because mind mapping design consists of various colors, lines, pictures, and shapes to explain the information

Some of the researchers also conduct the research that raise the mind mapping topic. The first research choose to develop this media due to students' difficulty in understanding physics lessons (Halimah et al., 2021). The second previous research related to this topic is conducted in Russia (Odaryuk, 2021). After collecting and analyzing the data, it is proved that learning by using mind mapping model is more effective than the conventional model. It is showed from the development of speaking skill, abilities, and students' improvement of the quality of knowledge and students' interest in foreign language. Using information and communication technology particularly smartphones in teaching and learning activities, becomes an innovation that can provide many educational benefits (Lomicka & Ducate, 2021; Machmud, 2018; Sert & Boynueğri, 2016; Tondeur et al.,

2017). Another positive thing found in the smartphone; is accessing several English learning applications that encourage students to increase knowledge in English learning (Fathi et al., 2018; Muzayyanna Zatulifa et al., 2018). For instance, Kahoot application, Hello English, Duolingo, etc. These applications are the non-boring and fun learning tool for students, which aims to ease them understand English lessons. Hence, designing and developing the learning applications on smartphones will be beneficial and essential for students in accessing English learning materials. Also, it can enhance their interest in learning English (Prasetya, 2021; Robertson, 2015).

To summarize, this study will develop an electronic module (e-module) of English based on mind mapping, to help students who do not have the Internet Quota to learn English in fun and easy way. This e-module can be accessed through students' smartphones without having a quota of internet. The limitation of this product only develops the seventh-grade materials of English subject, which is already based on the basic competence of the 2013 curriculum syllabus. The display of the material in the e-module will be more exciting and innovative by adapting the concept of mind mapping. In the mind mapping model, students will simultaneously combine the functions of both sides of the brain, left and right hemispheres, to collate and map the information they receive. Learning by using the concept of mind mapping will be helpful and enable students to remember materials without necessarily memorizing them since the information/material will be mapped by the varying branch of lines, pictures, and colors.

2. METHOD

This research applied the Research and Development (R&D) method to guide the researchers to answer research questions, gain the data, and produce a product. Borg and Gall cited in (Silalahi, 2018) said that R&D is a method used to develop and validate an innovative product in the education field. There are several development models to be used as guidelines for researchers in designing and developing products. For example, ADDIE model, ASSURE model, 4D model, DBR, Hannafin & Peck model, etc. This study used 4D model because it addressed for designing learning media and it is only providing four steps in conducting R&D research. 4D model is one of the models for developing learning media in the form of a product. The founders of 4D model were Sivasailam Thiagarajan, Dorothy Semmel, and Melvyn Semmel in 1974. 4D (four D) was taken from four stages of development namely Define, Design, Develop, and Disseminate. At the define stage, there are several steps to identify problems teaching and learning process, students' needs, and skills.

The participants of this research were the seventh grade students, particularly in the 7.1 classroom, which consists of 18 students in the second semester. To collect the data (students' need and characteristic), the researchers applied three instruments; observation, interview, and questionnaire. In addition, to get the identification results at this define stage, the researchers analyzed students' needs using the theory Need Analysis of James Dean Brown in 2016. There are three stages in Brown's theory of needs analysis (NA), the first is Get ready to Do NA, the second is Do the NA Research, and the third is Use the NA Results. The need analysis conducted at seventh grade students particularly in 7.1 classroom in MTs Al Yusra Gorontalo. This research used likert scale to determine and analyze the data (students' needs). After determining and analyzing the students' need, researchers started to design English material in the mind mapping model by using Canva application, and united those material become an e-module using Storyline Articulate application so students could access the English e-module through their smarphone. Then, to improve the feasibility of English e-module product design, researchers involved two experts; media and material experts to give their judgment on the English e-module product. The instrument grid is presented in Table 1.

Table 1. The Instrument Grid

Expert/Judge of E-module	Assessment Indicator
Material Expert	Content of Material in E-module Evaluation Section in E-module
Media Expert	Objective of Learning Visual Animation Colour Composition Clarity in Writing Simplicity of E-module Use

The result of expert judgments counted by using the formula of “Media Product Feasibility Interpretation” presented in Table 2 (Sriadhi, 2018). Additionally, the students' response of the product result also needed in the development stage as the third phase of 4D model. The result of students' responses

formulated by using the “RS Formula” presented in Table 3 (Arisa, 2022). The last stage was dissemination where researchers started to disseminate the English e-module product to teacher and students at class 7.1 in MTs Al Yusra.

Table 2. Media Product Feasibility Interpretation

No	Mean Score Interval	Interpretation
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	Highly Feasible

(Sriadhi, 2018)

Table 3. The RS Formula for Calculating the Result of Students’ Response on the Product

Criteria	Interpretation
$85\% \leq RS$	Highly Positive
$70\% \leq RS < 85\%$	Positive
$50\% \leq RS < 70\%$	Less Positive
$RS < 50\%$	Not Positive

(Arisa, 2022).

3. RESULT AND DISCUSSION

Result

There are 4 indicators used to analyze student needs; discrepancy, democratic, analytic, and diagnostic philosophy (Brown, 2016). These four indicators are the first stage in the 4D model, namely the "Define" stage. Discrepancy philosophy “Needs are any differences between future desired student language performances and what they can currently do”. *Democratic philosophy* “Needs are any learning goals that are preferred by a majority of the stakeholders involved”. *Analytic philosophy* “Needs are whatever the students would naturally learn next based on what is known about them and the learning processes involved”. *Diagnostic philosophy* “Needs are any language elements or skills that would be harmful if missing”. First, *Discrepancy philosophy*. The question represented the discrepancy aspect of finding the differences between students’ future desires and students’ language performance now during learning and studying English. The results of the analysis are presented in Figure 1.

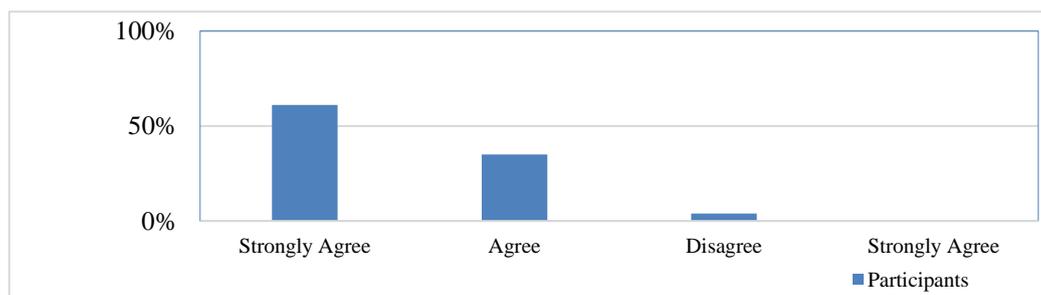


Figure 1. Discrepancy Philosophy Analysis Results

The chart implied that 61 % of students in class 7.1 stated “strongly agree”, and 35 % of them selected “agree”. It means students were motivated to learn a lot of words and sentences related to nouns, verbs, and adjectives. For instance, nouns consisted of people, animals, things, and places or public buildings. They were able to identify words that belong within the categories of "animals," "people," "objects," and "places/public buildings”. As a result, the researcher decided to create a product that was specific to the needs and characteristics of MTs Al Yusra students in grade 7.1. The e-module product will contain part of speech material because noun, verb, adjective, etc included in Part of Speech material. There are eight parts of speech: noun, verb, adjective, pronoun, preposition, adverb, conjunction, and interjection. Verbs, nouns, adjectives, and adverbs are crucial to learning because about 99% of words in the English dictionary are categorized as nouns, verbs, and adjectives (Sulastri et al., 2022). However, this English e-module product would only develop and

discuss noun, verb, adjective, preposition, and personal pronoun materials because they are adjusted to the basic competencies in the seventh-grade syllabus, namely KD 3.4, 3.5, and 3.6.

Second, *Democratic philosophy*. This section has the purpose of determining the needs of learners who are learning English; in other words, it is a learning objective involving various stakeholders. There are multiple measures of the significance of learning English and the media teachers utilize to assist their quick teaching and learning methods. Discrepancy Philosophy Analysis Results in Figure 2.

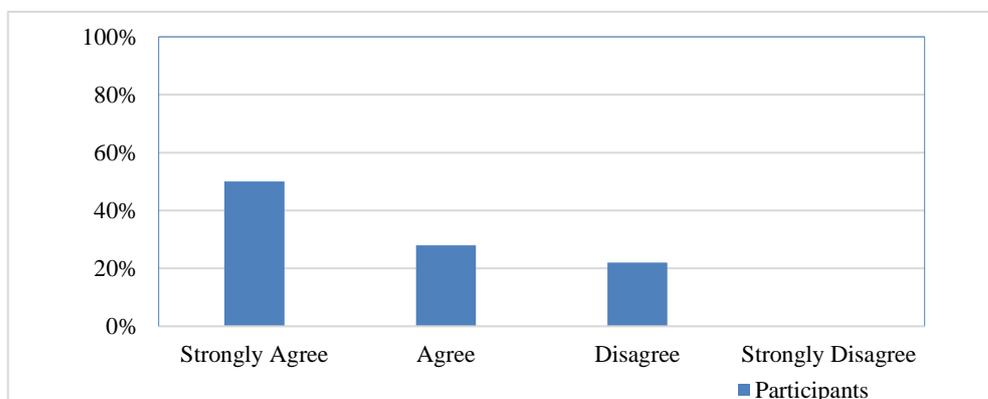


Figure 2. Discrepancy Philosophy Analysis Results

According to the findings in figure 2, using smartphones as the learning tools could facilitate students in overcoming challenges and obstacles when learning English. It was proven with the students' response selection that they agreed and strongly agreed formed; 50 % strongly agreed and 28 % agreed. Several of these reasons included the fact that students could quickly and easily access the definitions of multiple words, phrases, and sentences in online dictionaries. Additionally, while reading the content of material that was challenging to comprehend, students had the option of watching YouTube videos that explained the subject. Also, the content on YouTube was presented through the entertaining videos with eye-catching animations and graphics. Some students also downloaded applications for their mobile devices like Word Link, Word Puzzle, and Mondly Language that could help them learn English through games. According to (Hasan et al., 2021) which described various learning media, students could get two different types of media when using smartphones. The first is audio-visual media such as videos, and the second includes computer-based materials like educational apps, platforms, and websites. That was the reason why smartphones could be quite helpful to students in studying English.

Third, *Analytic Philosophy*. Analytic philosophy aims to determine the continuity of each material topic studied by students, whether the teacher explains the material following the sequence or not because the guide to the sequence of essential material from easy to difficult material has been designed in the 2013 curriculum syllabus. Discrepancy Philosophy Analysis Results showed in Figure 3.

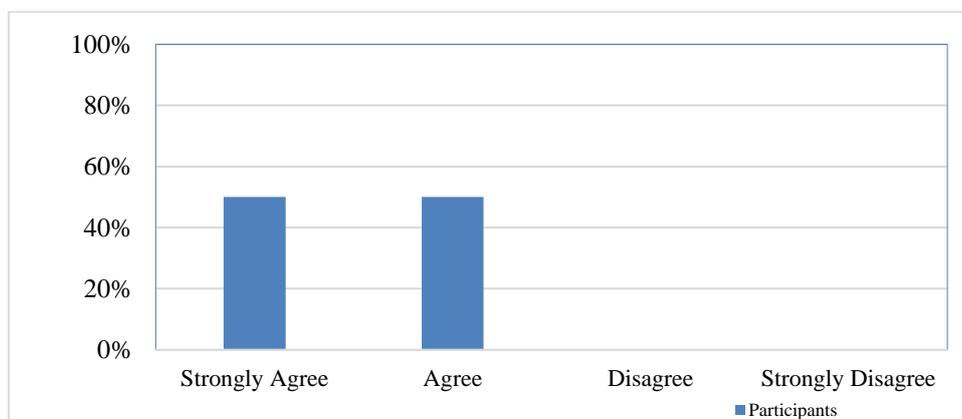


Figure 3. Analytic Philosophy Analysis Results

Figure 3 presented the results of students' opinions on the existing statements, which balanced between strongly agreed 50 % and agreed 50 %, showing that the teacher explained the material appropriately with the

guidelines in the syllabus. It means that the teacher succeeds in managing the learning process. In the seventh-grade curriculum syllabus, the first material began with basic material on how to greet, say goodbye, thank, and apologize to others in English. After that, students would learn to ask for and provide information about their identity. Then proceed with introducing objects (nouns) around students, the behavior of things, and the character of these objects. Therefore, the English e-module as a product of this research raised material on basic competencies (KD) 3.4, namely the introduction of ks, KD 3.5 discussed the character of nouns, and 3.6 which studied the behavior or actions of nouns.

Fourth, *Diagnostic Philosophy*. The diagnostic section aims to find out the elements or skills that must be taught to students, and these skills should not be eliminated in learning English. *Diagnostic Philosophy* Analysis Results showed in Figure 4.

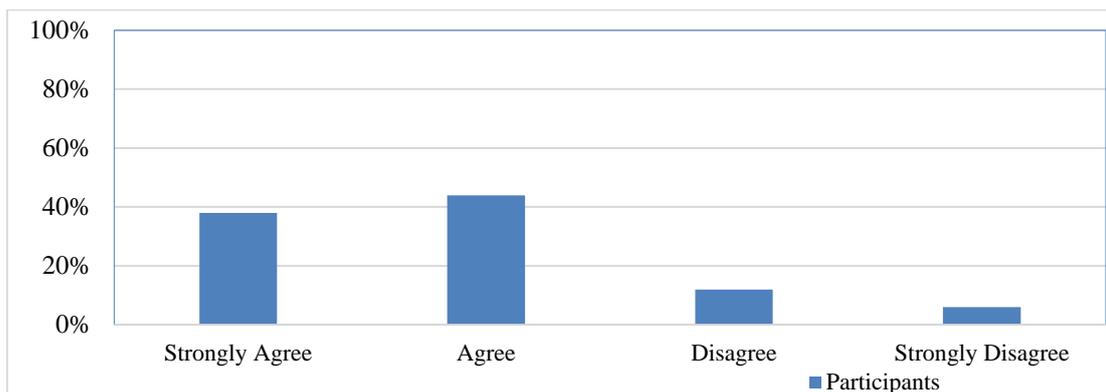


Figure 4. Diagnostic Philosophy Analysis Results

Figure 4 presented the percentage of students' answers 44 % agreed and 38 % strongly agreed with the statement that the teacher taught the four skills in English. The implication of the four skills could not be separated from each material topic because they were integrated. The syllabus did not mention the four-skill teaching guide. Still, its implementation was mandatory because these four skills were merged with all English learning topics in any class and level. For example, on the material of nouns, the teacher would teach reading by showing students the picture and one vocabulary, then ask them to listen the correct way of how to pronounce that word. After that, the teacher asked students to mention that vocabulary as well as the correct pronunciation and write it on their notebook. Therefore, that was an illustrative example of the learning process of fourth skills which integrated to all topics of English material. Result of Product showed in Figure 5.

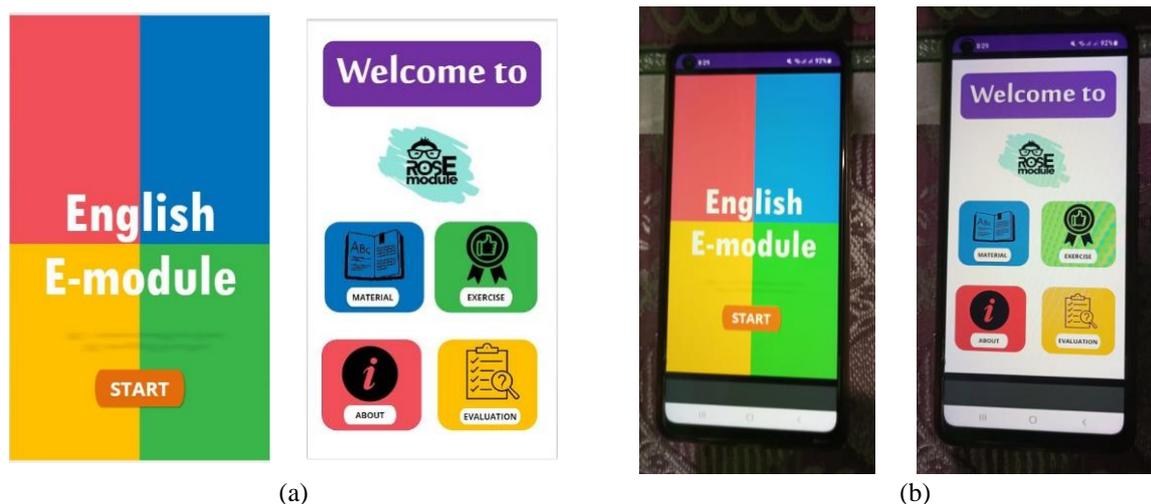


Figure 5. (a) Product Display on Computer, (b) Product Display on Student Smartphone

Discussion

Based on the findings above, the English e-module product is designed according to the needs of students previously. The “design” was the second stage with several steps. The design stage consisted of two steps; the first step starts with selecting materials and media to be designed, then the second step is selecting the

design format as a form of initial design (Lawhon, 1976; Sriadhi, 2018). These steps have been applied in this study. The selection of the part of speech material as the material to be developed was the first step taken. The choice of a design format in the form of a mind mapping model concept became the second step in this research. The researchers designed the part of speech with the idea of mind mapping to simplify the material's content to make it easier for students to understand. However, the steps in this study's design stage did not stop at the initial design or the second step only. A researcher needed to add a third or final design step as a form of refinement of the design stage in the 4D model. The final design step in this study was a process where the researchers united a collection of materials to be used as an English learning medium called an English e-module.

The addition of Steps in this study became a development of the design stage, which initially only had two steps. It differed from previous studies because the final design step might not have been needed for their research. In the final design step, the researchers made a storyboard as a reference for designing the e-module in the Storyline Articulate application. When all the parts of speech material have been created in the Canva application and the storyboard completed, they would be united using the Storyline Articulate application (Husna, 2022; Rafmana & Chotimah, 2018; Yasin & Ducha, 2017). Additionally, to ease students access the English e-module on their smartphone, the result of e-module from Storyline Articulate application would be convert in Web APK Builder application (Arwanda et al., 2020; Nugroho & Arrosyad, 2020). There were several research that utilizing Storyline Articulate as a learning media, but it can only be utilized through computer. While the result of e-module development of this research could be used in students' smartphone. Therefore, the final design step was a renewal of this study's design process, which aimed to improve the product design process to completion. The following are several illustrations of English e-module design.

In development stage, the researchers took two steps: the expert appraisal and developmental testing of products that have been designed. Expert appraisal/judgment is an assessment technique of someone who has expertise in a field by giving perspectives and contributing to the decision-making on product design (Arwanda et al., 2020; Hora, 2014; Rofiq et al., 2019). In the expert appraisal step, this research involved two experts; media and material expert. Based on the material expert judgment, it concluded that the English e-module as the product of this research is feasible to be utilized because it gained a mean score of 4.00 through counting on the Media Product Feasibility Interpretation formula. While the evaluation from the media expert achieved a mean score of 3.60, indicating that, with some adjustments, this e-module product was feasible. Besides, there are still several improvements and suggestions from the material expert that need to be revised as the enhancement of this product (Sukmana & Suartama, 2019; Wisada et al., 2019).

This English e-module has also been piloted to grade 7.1 students at MTs Al Yusra to determine their response to this product. After the students answered the ten statements in the questionnaire, the student responses were 90 %. It included in the interval 85% RS 100% or in the highly positive category. The highly positive was defined as practicality, feasibility, and effectiveness of a product that has been developed (Learning & Matematis, 2020; Lestari & Parmiti, 2020; Muga et al., 2017; Riwu et al., 2018). It indicated that students responded highly positive to the English e-module product because they felt easy to understand the material presented and uncomplicated to access or operate the application. The interval result (highly positive) become evidence that English e-module is an effective learning media. The development stage in this study applied both the expert judgment process and developmental testing to students.

The developmental testing process on students, the researchers did not only look at the practicality of the English e-module but also investigated the effect that students can get when using this English e-module. For example, students understanding of learning the existing material and the ease with which students operate the e-module application on their smartphone. while several previous studies, have a different process or step from this research, especially at the development stage in the 4D model (Dewi et al., 2019; Hidayati et al., 2021). The study implemented both expert assessment steps and developmental testing, specifically practical trials of their computer-based e-module products on students and teachers (Dewi et al., 2019; Elvarita et al., 2020; Husnulwati et al., 2019; Sa'diyah, 2021). Moreover, the research did not carry out the developmental testing step on students and only involved media experts, linguists, and material experts to assess their mind mapping module. However, this is different from what was done in this study (Hidayati et al., 2021).

The last stage of the 4D model was disseminated, where the product reached the final stage of production. At this stage, the researchers has disseminated the English e-module product to students at 7.1 class. Teachers and researchers tested the level of students' understanding by teaching one material, namely the Noun material, and asking students to work on the existing practice questions. The average score of seventh-grade students in MTs Al Yusra when studying Noun material in the English e-module application reached 89. It is summarized that the English e-module could enhance students' understanding and interest in learning English because the media used is technology-based. The learning process should also be based on digital media to deal with the growth and development of students born in the technological era (Andani, 2020; Darmayasa et al., 2018; Solihudin JH, 2018; Suarsana & Mahayukti, 2013). The English e-module is the best solution to solve problems faced by students who are part of the Gen Z generation in the learning process.

The English e-module product of this study provides enormous benefits for students to enhance their understanding of learning through the mind mapping concept. It is appropriate with the primary objective of this study to develop a learning application whose materials are presented in a simple and easily accessible way. Also, students use the e-module on their smartphones without having to buy the internet quota (Asrial et al., 2019; Dewi & Lestari, 2020; Sari et al., 2020). The use of e-modules in the learning process can assist students to understand the material and implement the learning independently, so that the learning objectives are perfectly achieved (Istikomah et al., 2020; Raharjo et al., 2017; Ula & Fadila, 2018; Winatha et al., 2018). It was evidenced by previous research on the development of e-modules on Dietetic Clinic material to improve learning outcomes for class X students majoring in culinary. The application of the RnD method with the 4D developmental model had also been used as a guideline in this study, and the results at the develop stage showed that students gave a positive response about 86.61% on the feasibility and effectiveness of using the e-module in escalating their understanding and achievement in Dietetic Clinic material (Rahmatunisa et al., 2022).

Thus, utilizing English e-module application to learn part of speech provides the concisely, simply, and pleasantly material. It is also support the government recommendation to use learning media in technological-based. As for some of the advantages, the English e-module is a breakthrough and modern learning media which appropriate to the technological era's development. Besides this product is easy to understand, the English e-module could also used anywhere and anytime through students' smartphone without need an internet quota. The implications of the results of this research are to ease, assist, and facilitate students in understanding the primary English material (part of speech) without having to read long and complicated explanations and memorize vocabulary one by one. Using the English e-module based on mind mapping learning media, students can study independently anytime and anywhere solely by operating the English e-module from their smartphone without needing an internet quota (offline).

4. CONCLUSION

The results obtained from the material expert, media expert, and developmental testing for students show that the English e-module based on the mind mapping model is feasible. It indicates that seventh-grade junior high school students can utilize the English e-module based on mind mapping as a learning medium. This English e-module based on mind mapping is significantly appropriate to use in the second semester because the materials contained in the English e-module are six "part of speech" materials following the basic competencies 3.4-3.6 in the curriculum of seventh-grade subject English.

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