DEVELOPMENT MIND MAP LEARNING MEDIA FOR APPLICATION-ASSISTED ENGLISH COURSES

Nelya Juita; Marliyus Sunarhati; Rita Anggrainy; Zulaikah
Universitas Palembang, Palembang, Indonesia
Universitas Palembang, Palembang, Indonesia
Universitas Palembang, Palembang, Indonesia
Universitas Nurul Huda, Ogan Komering Ulu Timur, Indonesia
nelya0807@gmail.com; marliyus@gmail.com;
rita.anggrainy@gmail.com; zulaikah@unuha.ac.id

Received: December 28, 2023; Accepted: January 27, 2024; Published: January 30, 2024

Abstract- *In classroom learning activities, the presence of media is essential to pay attention to. If selected and used according to class conditions, various alternative uses of learning media will provide optimal results. This research aims to develop learning media using the Freemind application in English courses to produce learning media that is valid, practical, and has potential effects. The results obtained from the development stages carried out by researchers showed that the mind map media with the developed Freemind application was declared to have proven its practicality. The score of learning outcomes for English courses in the medium category determined the effectiveness of the mind map media with the Freemind application. This was based on The results of calculating the N gain value in material 1, which was 0.4708 (effective in the medium category), and the calculation of N gain was 0.4882 in material 2 (effective in the medium category), so the average score was 0.4795. However, the basic comparisons used as research material in this study were only obtained from 2 materials.*

Keywords*: media development; mind map; freemind*

Corresponding Author:
Rita Anggrainy
Universitas Palembang
Jl. Dharmapala 1A Bukit Lama Ilir Barat I, Palembang

INTRODUCTION

The English course is one of the general courses at the Faculty of Engineering, University of Palembang (UNPAL). Engineering English is a general course that must be taken by all students majoring in Electrical and Civil Engineering at Palembang University. This course equips students with knowledge of English related to Electrical and Civil Engineering. In this course, there are many concepts that students must master.

To convey these concepts is not easy, especially since these essential concepts are interconnected with each other. Therefore, lecturers need the ability to choose the suitable media to convey it. Gagne (in Sadiman et al., 2009) states that media is a component that can stimulate students to learn.

The media lecturers use in delivering new learning material is limited to textbooks, which contain an outline of the content of the lecture material. Based on observations during the learning process, many students looked bored. This results in students' understanding of the concepts given being unsatisfactory, as can be seen from the fact that there are still students who get C grades (25%), which is caused by many factors. Learning media are all intermediaries that people use to disseminate ideas so that the ideas or thoughts reach the recipient (Rusman, 2012). Learning media are all forms and channels people use to channel messages or information in learning (AECT).

To be able to choose learning media, according to Arsyad (2016), these include: 1) The media must be by the objectives to be achieved; 2) Media must be appropriate to support learning content; 3) Media must be practical, flexible, and sustainable; 4) must be skilled in using it; 5) Media can group targets; and 6) Media must have technical quality. In this research activity, the learning medium is a mind map. A mind map is a way to organize and present concepts, ideas, tasks, or other information in diagram form (Fathurrrohman, 2015, p. 206). Mind maps can transform information into knowledge, insight, and action. The information presented focuses on essential parts to encourage people to explore and elaborate on them. By using mind maps, individuals can more effectively communicate their ideas so that others who read their mind maps can understand them. Including text, image, audio, and video data in a mind map and looking up explanations within the mind map were all made possible by those media (Cobena, 2020).

In learning activities in class, media use is carried out with the help of applications; mind maps can be created using computer applications, both offline and online. According to Tee et al. (2014), some benefits of mind maps include summarising information, displaying it in a way that highlights the main points, studying, retaining, and recalling information, and encouraging meaningful learning instead of memorization. Using mind maps is more efficient than using idea maps. Even better, if the person using

the mind map is familiar with specific software that allows them to build mind maps faster and with a more dynamic presentation (Ying et al., 2014). Furthermore, making a mind map with the help of an application feels more accessible and more fun. One application that can be used to create a mind map is Freemind. Freemind is a simple and easy-to-use application. With this application, mind map media becomes more interesting because it is equipped with images, colors, and hyperlinks to various types of files. Aulia et al., (2018) research on Freemind software concluded that using Freemind influenced student learning outcomes in human needs material at SMA Negeri 4 Palembang. Likewise with other research, such as "The Effect of Using Mind Mapping on Student Learning Outcomes on the Subject Matter of the Human Digestive System" by Susanti (2018), The research results show that the use of mind mapping can improve student learning outcomes on the subject of the human digestive system. Furthermore, the results of the research "The Effect of Applying Mind Mapping on Conceptual Understanding of Excretory System Material in Class VIII Students of SMP Negeri 11 Semarang" by Astuti (2017): The results of the research show that the application of mind mapping can increase students' conceptual understanding of excretory system material.

Looking at some of the research literature above, which promises to encourage better student understanding, researchers are also interested in trying it, but the point of concern is that it does not include elements of the latest technological developments; the author believes that here we can take advantage of this research gap so that we can also use it as an element of novelty in the research being carried out. We did at that time. The courses we use as mind map media are English courses that are mostly just concepts but with quite complex explanations, so they are worthy of being used as scientific articles.

Although this research activity was carried out in various stages and the results were appropriate to the stages, what the author wants to convey is to describe how the level of student understanding of the material being developed is seen from the ability to answer test questions carried out before and after using the media resulting from the development of learning media using mind mapping. The validity and other processes in this research have been presented in our previous article, and several test results in different aspects, such as learning motivation, will be presented in a different article.

METHODS

Research Design

This research is a form of research and development aimed at producing a learning media prototype for English courses. This research and development refers to the R & D cycle of Borg and Gall (in Sukmadinata, 2007). Through cyclical and recurring processes or steps, such as field testing and product revisions, research and development seeks to generate and manufacture valid research products until, at last, a product that satisfies the specified objectives is produced (Rabiah, 2018). Current development research is a form of research and development aimed at producing learning media prototypes in English courses. Population and sample in this research (Research and Development) refer to the R & D cycle of Borg and Gall. Then, a mind map research approach was created to assess learning results individually and in groups. Researchers could measure students' knowledge construction in an emergent curriculum on multiple levels and compare it to a core curriculum using the mind map analysis tool (Stokhof et al., 2020). Participants in this research were all students of the Faculty of Civil Engineering, Palembang University, in the 2018/2019 academic year.

Research procedure

The research procedures undertaken in this research follow the steps in development research, which are briefly depicted in Figure 1 below:

Figure 1. Media Mind Map Development Procedure

The research steps for developing mind map media using the Freemind application are described as follows:

Preliminary studies

A preliminary study was conducted to obtain initial information about the media used in learning English courses. The first step is to conduct a needs analysis to obtain information about the problems, obstacles, and phenomena faced in learning English courses.

Product Development

The researcher's first step at this stage was to discuss the preliminary results with the research team. Next, a mind map media design was prepared using the Freemind application. After that, the next step is media production. Expert validation was carried out twice to determine the level of product validity, namely material experts and media experts. At the expert review stage, the product that has been designed is scrutinized, assessed, and evaluated by experts. These experts reviewed each prototype's material (content) and media (layout) aspects. Expert suggestions are used to revise the tools developed. At this stage, responses and suggestions from experts (validators) regarding the design created are written on the validation sheet as material for revising and stating whether this design is valid.

Product Trial

The initial stage of the research was to try out the mind map media; the researcher implemented the mind map media that had been prepared. During the trial, observations were made to obtain data to perfect the mind map media. The results of the trial observations were then discussed between the researcher and the lecturer. The trial was carried out in several stages: one trial, a small group, and a field evaluation. In the one-to-one stage, the researcher utilized three randomly selected students representing the target population: one representing below-average ability, one representing medium, and one representing above-average. This stage aims to get students' opinions one by one about the learning media that is being developed.

The strategy in this stage is to obtain information from research students using observation and interview techniques. The one-to-one stage activities are: a) students are asked to use learning media in the form of a mind map that is being developed. b) researchers observed student behavior when using the program and noted their difficulties. c) After that, continue with the interview with prepared questions. The result of this one-to-one stage is that researchers will get comments and suggestions from students, which will then be used as guidelines for revising the prototype into a second prototype.

After the media is developed, researchers will validate it with experts, and the revised one-to-one stage will become the second prototype. This second prototype will be tested in a small group (Small Group) with seven students. The results of this small group stage were used to revise the second prototype into a third prototype. At the end of the media design activity, an evaluation is carried out; this is the final stage of formative evaluation; a field test is carried out when the learning media in the form of a mind map using the Freemind application has been completely revised, but it is possible to revise it again.

Test Data Analysis

The gain score was used to see the difference in the results obtained by students during the pre-test and post-test. To obtain N-gain, use the formula:

$$N_{gain} = \frac{\text{S postest} - \text{S pretest}}{\text{S Max} - \text{S pretest}}$$

Based on the formula N_{gain} is the normalized gain from the pre-test and post-test, S is the maximum (ideal) from the initial and final tests, S post is the final test scores, and S pre is the initial test scores. For the criteria for high and low gain, the normalized N_{gain} can be classified as shown in the following table:

Table 1. Gain Score Value Assessment Category

N_{gain} value criteria	Category
$N_{gain} \geq 0{,}7$	High
N_{gain} $0{,}7 > N_{gain} \geq 0{,}3$	Medium
$N_{gain} < 0{,}3$	Low

FINDINGS AND DISCUSSION

Finding

In this research, several stages produced various outputs as follows:

Product Development Results

At this stage, the researcher prepared teaching material media with the help of the Freemind program application to produce teaching materials that were practically valid and effective. Experts, including media and content experts, are validated before the media is tested for use on students. Expert review opinions and suggestions are input used to improve the media so that it is suitable for testing.

Evaluation with Formative Evaluation Tessmer

Products that have been developed before being implemented in the field must first be evaluated using Tessmer evaluation. Tessmer's evaluation consists of an expert review, a one-to-one evaluation, a small group evaluation, and a field test. The results of the development of learning media products that have been carried out and validated by two experts, namely in the design aspect and material aspect, can be seen in the image presented below:

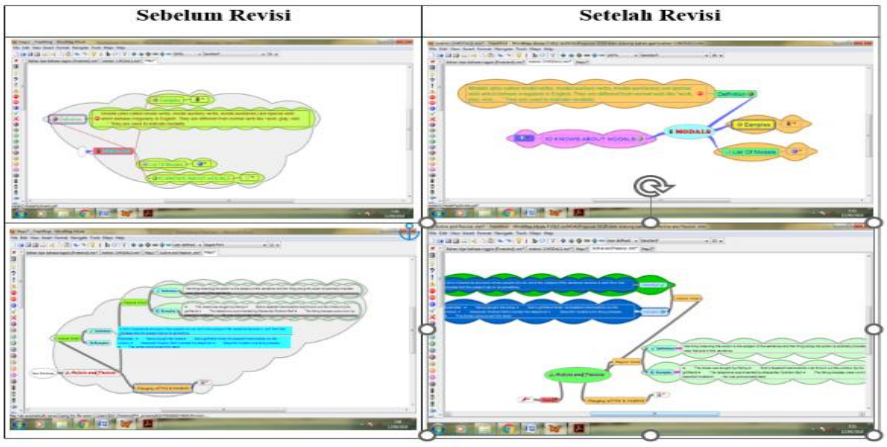

Figure 2. Media Development Results

Field Test Results

The results from the second prototype revision were then subjected to field testing. This stage aims to test the effectiveness of the media on student learning outcomes in the third prototype. The field test was carried out in the Engineering lecture room at Palembang University. The research subjects at this field test stage were all English students.

The results of the field trials showed that the average score obtained by students in the two pre-test materials was 60.15 in material 1 and 58.25 in material two. Furthermore, looking at the comparison of the average student scores during the pre-test and post-test, there was an increase of 19.25 or as much as in material 1 and 18.91 in material 2. This shows the effectiveness of the mind map media with the Freemind eye application. In English lectures, the average increase in the ability of the two materials tested increased learning outcomes by 19.08. Entirely presented in Table 2:

Table 2. Comparison of pre-test and Post Test

Average Material Value 1				**Average Material Value 2**		
Pre Test	**Post-test**	**Change**		**Pre Test**	**Post-test**	**Change**
60,15	79,67	19,25		58,25	77,16	18,91

Source: Primary data

To be able to obtain conclusions from the post and pretest results regarding student understanding as measured by the scores obtained using the average test scores obtained, it can be calculated using the N gain formula, namely:

$$N_{gain} = \frac{S\ postest - S\ Pretest}{100 - S\ Pretest}$$

Material 1

$$N\ gain = \frac{79{,}67 - 60{,}15}{100 - 60{,}15}$$

$$= 0{,}4882 \quad \text{(Medium category effectiveness)}$$

Material 2

$$\text{N } gain = \frac{77{,}16 - 58{,}25}{100 - 58{,}25}$$

$$= 0{,}4708 \quad \text{(Medium category effectiveness)}$$

From the calculations above, it can be concluded that the effectiveness of mind map media using the FreeMind application in the developed English courses is effective in the medium category.

Discussion

The mind map media with the Freemind application has been tested on 32 engineering faculty students to see the learning outcomes obtained by students with the help of different learning media used in learning activities in class on the specified material. This aims to test the effectiveness of the media. To see student learning outcomes as an indicator of the effectiveness of the English learning media being developed, students were given a pre-test and post-test at the beginning and end of learning at the second and third meetings. The students' pre-test and post-test results were then calculated using the N gain formula. The results of the calculations obtained an N gain score in material 1 of 0.4882 (effective in the medium category) and an N gain calculation of 0.4708 in material 2 (effective in the medium category). Learning outcomes have increased in the moderate range. Based on this description, the media developed has an average effectiveness of 0.4795, which is categorized as effective in the medium category, so that the media developed in learning activities can form an understanding of the material for Palembang University Engineering students.

Thus, the research results we obtained strengthen and prove some of the research we quoted at the beginning, namely, mind map media developed with the help of applications can improve students' understanding. As research conducted by Aulia et al., (2018) shows that learning media in the form of mind maps has the potential to influence student learning outcomes, and is valid and practical to use. In addition, Khusniyah (2019) concluded that using mind mapping as part of learning activities can result in students being actively involved in the teaching and learning process; they learn more effectively. Furthermore, students can also expand their thinking and become more creative in

generating ideas. From the user's perspective, teachers can utilize mind mapping to prepare and deliver information more quickly and easily. They can also use brainstorming to quickly produce and assess many ideas (Arulselvi, 2017).

CONCLUSIONS AND SUGGESTIONS

After testing the use of learning media with mind maps using the Freemind application, which was carried out in this research, it was able to encourage understanding of the material in English courses at the engineering faculty with a level of understanding in the medium category (0.4795). On the other hand, the research used the Borg and Gall model combined with the Tessmer model at the testing stage, so it will likely have different results if tested with other models. Each model has various characteristics, such as the Kemp Model, Dick-Carey Model, Four-D Model, PPSI Model (Instructional et al.), and several other models that are not mentioned. This is also a shortcoming, so further research can try various model approaches to developing learning media in the classroom.

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