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Students' Challenges and Strategies in Creating Mind Maps in The TEYL Course

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Abstract
This study aimed to identify the challenges students face when creating mind maps and to explain the strategies they use to address them. The study employed a descriptive, qualitative method, utilizing semi-structured interviews to collect the data. The participants were selected purposively, with twelve students from an English Study Program at a state university in Jambi who had taken the TEYL course and created mind maps. The data were analyzed using thematic analysis. The study's findings identified two main themes: The first is related to the students' challenges in creating mind maps, including being unfamiliar with mind maps, requiring a significant amount of time to create an engaging one, having limited space on the mind map, problems in using devices and applications to create mind maps, and identifying relevant keywords for the material. Meanwhile, the second is related to the strategies the students used in creating mind maps including creating a digital mind map, using a convenient device and a secure application, using visual elements, preparing a plan, grouping the material on the mind map, designing an efficient mind map format, using curved branches, preparing a summary of the material to create the keywords, and searching for many references. These findings provide valuable insights into the practical challenges students encountered in visual learning tasks and highlight their adaptive strategies in overcoming these challenges, reflecting their creativity, resourcefulness, and digital literacy.

Keywords: Challenges; Strategies; Learning media; Mind maps; TEYL course

INTRODUCTION

Learning media play an important role in the teaching and learning process. Appropriate media will help students understand the material and make learning more exciting and interactive. One learning medium that can help students quickly understand the material is mind maps (Abdel-Hamid, 2017; Aini, 2020; Atmono et al., 2021; Duong et al., 2020; Wilson et al., 2016). Mind mapping is defined as a practical, innovative, and adaptable learning medium often used in language teaching (Buran & Filyukov, 2015). It is also an important medium for students to gain a complete understanding. In simple terms, mind maps help students simplify complex information, making it easier to store and retrieve from memory (Chalak & Rastgoo, 2021).

Mind maps are not only integrated in secondary schools, but also in universities. At one state university in Jambi, particularly in the English Study Program, there is a course called Teaching English for Young Learners (TEYL). The course aims to introduce university students to the theory and practice of teaching

English as a foreign language to children aged 3 to 10 years old. The students learn how to teach young children, develop effective teaching practices, manage a classroom, and evaluate and assess student progress. In the TEYL course, the lecturer assigned students to summarize chapter lessons in the form of a mind map and to present it to the class.

In an interview with the lecturer, it was discovered that assigning students to create mind maps was intended to encourage them to read and comprehend the learning materials actively. The lecturer believed that by creating mind maps, students could get an overview of the materials and learn to think systematically, connecting one point to another. However, mind mapping can present some challenges for students. Previous studies have noted that students may struggle with creating comprehensive mind maps, as it takes time to organize and find essential keywords (Muhib et al., 2014). Proper placement of the branches can also be challenging (Nurlaila, 2013), and some students may be unfamiliar with the basic mind mapping format (Adodo, 2013).

Although some studies have investigated students' challenges in creating mind maps, few studies have explored university students' experiences in creating mind maps, especially in the Indonesian higher education context. Most existing research focuses either on the general benefits of mind mapping or its use in primary or secondary education. This study aims to fill that gap by investigating the challenges faced by university students creating mind maps in the TEYL course and examining how they encountered and addressed these challenges. By understanding students' experiences regarding the challenges and strategies involved in creating mind maps, this study aims to inform more effective use of visual learning media in teacher education programs. The findings also offer insights for educators seeking to optimize mind mapping as a medium for enhancing comprehension, engagement, and academic performance. To guide this study, the research questions were formulated as follows:

1. What challenges do students face in creating mind maps in the TEYL course?
2. How do students encounter the challenges of creating mind maps in the TEYL course?

RESEARCH METHODS

This study used a qualitative research method to identify the challenges students faced when creating mind maps in the TEYL course and the strategies they used to address the challenges. According to Lapan et al. (2012), qualitative research is designed to produce descriptive data in written or spoken form, focusing on collecting and interpreting words to gain a deeper understanding of participants' beliefs, experiences, attitudes, behaviour, and interactions. The research was conducted in the English Study Program's TEYL course at a state university in Jambi, chosen explicitly because the course actively assigned mind mapping as a graded summary and presentation task. The research focused on the 2020 student batch who had completed the TEYL course to identify the challenges faced by students and the strategies they used to address these challenges in creating mind maps within the TEYL course.

Research Design

This study used a qualitative research method to identify the challenges students faced when creating mind maps in the TEYL course and the strategies they used to address the challenges. According to Lapan et al. (2012), qualitative research is designed to produce descriptive data in written or spoken form, focusing on collecting and interpreting words to gain a deeper understanding of participants' beliefs, experiences, attitudes, behaviour, and interactions. The research was conducted in the English Study Program's TEYL course at a state university in Jambi, chosen explicitly because the course actively assigned mind mapping as a graded summary and presentation task. The research focused on the 2020 student batch who had completed the TEYL course to identify the challenges faced by students and the strategies they used to address these challenges in creating mind maps within the TEYL course.

Research Target/Subject

The research involved students from the 2020 batch of the English Study Program in the TEYL course at one state university in Jambi. The participants were selected using purposive sampling, a technique in which researchers choose participants based on predetermined criteria relevant to the research

objective (Guest et al., 2006). Based on the criteria, twelve students who had taken the TEYL course were selected, as this number is often cited as sufficient to achieve data saturation in qualitative studies (Guest et al., 2006). The participants' names were initialized (e.g., S1, S2, S3, …, S12). The participants approved and permitted the initialling of their names to protect their privacy.

Research Procedure

The research procedure consisted of several systematic stages to ensure that the study was conducted effectively and in alignment with the principles of qualitative research. The following steps were undertaken:

1. Preparation Stage

At the initial stage, the researchers determined the research focus, formulated the research questions, and reviewed relevant literature on mind mapping, learning strategies, and challenges in English language education. Ethical considerations were also addressed by obtaining permission from the head of the English Study Program and informed consent from the participants. The interview protocol was then designed to guide data collection and ensure that the questions were relevant to the study's objectives.

2. Participant Selection

The participants were selected using purposive sampling. Twelve students from the 2020 batch of the English Study Program at a state university in Jambi who had completed the TEYL course were chosen. These participants met the inclusion criteria—having experience in creating mind maps as part of the TEYL course assessment. Each participant was assigned an initial code (S1–S12) to maintain confidentiality.

3. Data Collection Stage

Data were collected through semi-structured interviews, conducted both face-to-face and online (via Zoom and WhatsApp voice calls), depending on the participants' availability. Each interview lasted approximately 15 to 30 minutes. During this process, the researchers followed the interview guide, focusing on the challenges and strategies in creating mind maps. A mix of Indonesian and English was used to ensure participants' comfort and clarity. All interviews were audio-recorded with the participants' consent and later transcribed verbatim for analysis.

4. Data Analysis Stage

The transcribed data were analyzed using Braun and Clarke's (2006) six-phase thematic analysis: (1) familiarizing with the data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report. Themes were identified based on recurring patterns related to students' challenges and strategies in creating mind maps. The results were further supported by direct quotations from participants, which strengthened credibility.

5. Trustworthiness and Validation

To ensure the credibility of the findings, a member-checking procedure was conducted by returning the interview transcripts to participants for confirmation and verification. Dependability was maintained by keeping a detailed audit trail documenting each stage of data collection and analysis. Transferability was established through the provision of rich descriptions of the research context, participants, and processes.

6. Reporting Stage

Finally, the results were organized into major themes and sub-themes, highlighting the challenges students faced and the strategies they employed. A summary table was created to present the findings clearly, followed by a discussion that linked the results to relevant theories and previous studies.

Instruments and Data Collection Techniques

The instrument of this research was the semi-structured interview. Interviews are considered a flexible and effective method for collecting data in qualitative research, especially for gaining insights into participants' experiences (Ryan et al., 2009). In this research, interviews were conducted face-to-face and online (via Zoom and WhatsApp voice calls), lasting approximately 15-30 minutes. An interview protocol

was used to guide one of the researchers during the interview process, focusing on students' challenges in creating mind maps and the strategies they used to address these challenges. A combination of Indonesian and English was used during the interviews to ensure participants' comfort and prevent misunderstandings. All interviews were recorded and transcribed verbatim.

Data analysis technique

The interview data were analyzed using the six steps of thematic analysis proposed by Braun and Clarke (2006): familiarizing with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and finally, writing up the findings. For the first step, the researchers got familiar with the data by transcribing it after listening to the interview record multiple times. Second, the initial codes were created. The researchers highlighted and grouped important lines in the transcription into the initial codes that had been created. Third, the researchers identified themes by combining codes into a theme and reviewing the resulting themes. Next, the themes were defined and named. Ultimately, the final report was written by connecting the findings with related theories and previous studies.

To ensure the trustworthiness of the qualitative data, the researchers employed the member-checking technique, which helped establish credibility and confirmability by providing participants with the interview transcripts. Next, dependability (reliability) was ensured through a clear audit trail, which maintained a detailed record of every step in the data collection and analysis process, from the initial coding to the final themes (Braun & Clarke, 2006). Lastly, transferability (generalizability), detailed descriptions of the research context (TEYL course, Indonesian university context), and transparency in the research's results.

RESULTS AND DISCUSSION

Based on the analysis of the interview data, we grouped our findings into two main themes and several sub-themes. The themes relate to challenges and strategies for creating mind maps, as shown in the following table.

Table 1. Thematic Analysis of Challenges and Strategies in Mind Map Development

Challenges	Strategies
Unfamiliarity with mind maps & lack of feedback	Search for multiple references (on the internet, social media, and peer discussions) to find best practices.
Time-consuming creation (traditional/design)	Create a digital mind map (using Canva/other tools) and prepare a plan (schematic outline) first. Difficulty
Difficulty identifying keywords (complex/English text)	Read or re-read the material multiple times, and prepare a summary of the material to create keywords
Limited space on the mind map	Use curved branches and design an efficient format by grouping materials with different colors and shapes.
Technical issues (limited features/device selection)	Use a convenient device (e.g., a laptop) and a secure application (to prevent file loss).

The explanation of each finding and the discussion is elaborated below:

Challenges in Creating Mind Maps

From the interview data, it is found that almost all of the participants faced similar challenges when creating their mind maps, such as being unfamiliar with mind maps, no feedback from the lecturer, requiring lots of time to create an engaging mind map, having limited space on the mind map, limited features of the applications to create mind maps, and creating keywords for the material. The extracts of the interview are presented below:

> "The first time in college, I was clueless because there was no course about mind mapping. So, I lacked information about mind maps." (S3)

Additionally, S3 also stated that the lecturer had no vivid feedback on the mind map. Therefore, students were unsure whether their mind maps had been created correctly. Below is his statement:

> "There was no vivid feedback from the lecturer on the mind maps. So, we were unsure whether our mind maps had been created properly." (S3)

Another challenge faced by participants was requiring lots of time to create an engaging mind map. Besides, when creating traditional mind maps, it took time to prepare the necessary materials, such as colored pencils, books, drawings, cardboard, paper, pencils, erasers, rulers, and pens. The evidence is evident in the following interview extracts.

> "I have never created a traditional mind map, but it was more complicated because of the time spent; we needed to prepare a ruler, and so on." (S1)

Moreover, S11 stated that she had to erase or redraw her mind maps when the error occurred while creating them, which took extra time and energy. In the interview, she said:

> "If there has been an error when creating traditional, it was more time-consuming and energy-draining, which affected my mood."

Furthermore, the participants required considerable time to utilize the visual elements (colors, icons, symbols, and pictures) on a mind map and determine the template or format of the mind map. The extracts from the interview are presented below:

> "The most challenging part of creating mind maps for me was deciding on the colors, icons, symbols, designs, font size, and font style." (S10)

Additionally, another participant was unsure about how to create unique, eye-catching, and easy-to-understand mind maps for others. This case is shown in the interview extract from S5 and S7 below:

> "I was not very creative, so it was a challenge to design mind maps. Although there were templates, we had to create unique and engaging mind maps to ensure they were distinct from others and to avoid accusations of plagiarism. This was important because creating mind maps was not only a learning medium but also an assessed assignment." (S5)

> "I was confused about deciding the theme for the next mind map." (S7)

Not only was creating mind maps using traditional tools challenging, but creating mind maps using digital tools was also challenging. The challenges included the limited space on the mind map, as stated by S3 below:

> "So, my difficulty was more about how to maximize the area to include all the material. Also, on the applications, if there were too many bubbles, the fonts would become small, making the writing unreadable and difficult to learn. In other words, my difficulty was maximizing the area on the mind map so it looked neat and readable." (S3)

Another challenge related to organizing pictures and limited features on the application can be seen in the following extracts:

> “I used a mobile phone to create digital mind maps, but I found it difficult to organize the pictures. I was not very creative and lacked the skills to use Canva. That was one of my difficulties in using the application.” (S2)

> “I made the traditional mind map more creative by adding colored pencils and highlighters. However, for the digital version, I only used different colors for each subchapter to distinguish between branches. I did not add icons or images because my application did not provide those features.” (S4)

S11 also mentioned that another challenge of using the application was downloading it, as the file was not stored securely, as evidenced by the statement below:

> “Another challenge with the application was that it was difficult to download. Additionally, we faced a problem when the file of the mind map that had been created was lost.”

Furthermore, most participants struggled to create keywords for the material. It was caused by some factors, as evidenced by the extracts from the interview below:

> "I have to read carefully and accurately to create the keywords. Two courses were assigned to create mind maps. The courses covered complex material, and the book was written in full English, making it difficult for me to understand the material due to my limited concentration and vocabulary. Also, it was difficult to summarize a long paragraph into a short paragraph." (S11)

In addition, some participants did not create the keywords on the mind map because it was pretty tricky for them, as stated below:

> “In my experience, I did not create keywords because it was quite challenging for me to summarise the contents of each sub-chapter.” (S4)

Some participants also stated they were too lazy to read the material because there was too much material to create keywords in a mind map, as expressed below:

> “I was unsure which key points to include in the mind map because I was too lazy to read the book. Moreover, I would be presenting the mind map; it was challenging to prepare a script for speaking in front of the class.” (S1)

The above extracts indicate that participants faced challenges in creating mind maps as a learning medium in the TEYL course, such as many felt unfamiliar with the format and lacked basic knowledge of the proper mind map format (Adodo, 2013). Additionally, the students did not receive clear feedback from the lecturer on whether they had created the mind maps properly (Al-Fazry, 2024; Dmoshinskaia et al., 2021). This lack of guidance left them unsure if their maps were created correctly.

Another challenge was requiring lots of time to create an engaging mind map (Muhib et al., 2014; Buzan, 1993), which was caused by several factors such as creating a traditional mind map (e.g., preparing the necessary stuff, writing information neatly, limited space in traditional mind mapping, and the risk of errors occurring, which consumed much time and energy in corrections), creating an engaging mind map (e.g., using a visual element, determining the template or format of the mind map by adjusting the material), and did not have good skills in drawing or designing of the mind map (Nurlaila, 2013).

Additionally, it had limited space on the mind map, which required selecting the mind map format design, organizing the proper placement of the keywords column, and composing the mind map branch

layout to ensure alignment and neatness (Nurlaila, 2013).

Moreover, creating digital mind maps using devices and applications was a challenge, with the most significant challenge being the identification of keywords for the material (Muhib et al., 2014). It was caused by several factors, including dealing with complex or extensive material, having a limited vocabulary due to the e-book being in full English, a lack of concentration resulting from distractions from other course assignments and activities, such as work, and a lack of motivation to read the books thoroughly.

Strategies for Creating Mind Maps

Based on the interview data, participants employed various strategies to address the challenges of creating conventional or manual mind maps in the TEYL course. The strategies include creating a digital mind map and considering practical things, as elaborated below.

> "If you want to make mind maps more practical or do not want to waste much time, you can use digital mind maps. I think it was more practical." (S9)

> "In my opinion, nowadays, creating mind maps is easier because certain internet websites can help with mind map designs, or there is the Canva application, which offers a variety of design templates that can be customized in color." (S8)

> "I chose to use a laptop because the smaller screen of a mobile phone made it difficult to organize the design. Using a laptop made it easier to organize the design of the mind map." (S10)

The choice of devices and applications depended on individual comfort. Some participants used mobile phones to create mind maps at any time and from anywhere. Moreover, some participants had a strategy to create engaging mind maps by adjusting the context of the material theme, as S11 stated below:

> "When I created mind maps, I preferred to add various colours and images relevant to the material's context to make it more interesting and enthusiastic." (S11)

> S11 also believed that adding colours to mind mapping could help students better remember the material, as stated below:

> "We could add various colours to memorize the material better."

Additionally, some participants developed a plan to create a mind map to anticipate errors and manage time more effectively. This is evidenced in the interview excerpt below:

> "I used to create a schematic on paper first, such as the points of the material, the design of the mind map format, and the number of branches in each chapter and sub-chapter." (S11)

S3 also expressed:

> "After I had read the material, I made an abstract first before creating the mind map because I would recreate it if there were errors."

Another strategy was grouping the material on the mind map. Some participants grouped the materials by differentiating the colours, branches, and columns at each point. The following extract from the interview below evidences this:

“I used colors to group the material points, so it was easy to read and find the material.” (S13)

"I made different branches to differentiate the subtitles and explanations, such as twisted, straight, and thick, or zigzag." (S5)

“I grouped the material using different shapes on the mind map. For example, I used a square column for the sub-point and a rectangle for the main point. Then, I added an arrow to explain the sub point.” (S10)

Furthermore, the participants used curved branches to maximize space utilization, facilitate column layout arrangement, and make the map more visually appealing. The extracts of the interview are presented below:

"We created curved branches to maximize the area or space in the mind map, especially if the space is small, like in the application, but with much material, it was better to use curved branches." (S3)

Other strategies to address the challenges in creating mind maps are reading the material multiple times (e.g., twice or three times), summarising the material, highlighting or noting important information, creating keywords for the material on the mind maps, and rephrasing it in their own words to aid in understanding. The interview excerpts below provide insight into students' strategies for coping with the challenges they encountered while creating mind maps.

“I made the keywords by reading the material multiple times and summarizing the text in the outline.” (S9)

“If there were much material, I would search for a summary on Google and re-summarize it." (S10)

“I created the keywords with a short explanation to guide me when explaining in front of the class.” (S7)

“When creating keywords, we should explain using our language because if we used the language of the book, it would be too difficult to understand.” (S12)

Meanwhile, some participants did not create the keywords for the material, but they created points with a short explanation, as S1 said below:

“I included many examples of complex material to help the audience and myself better understand the material.”

Lastly, most participants created mind maps by searching for references on the internet, applications, or discussing with friends, as evidenced by the statement from S3 below:

“I searched for references on the internet, Pinterest, and social media because I frequently accessed my social media accounts. Nowadays, it is easy and very common to find content that has appeared on your TikTok page or other platforms.”

From the above extracts, it is evident that specific strategies can be employed to address challenges in creating mind maps, such as utilizing digital mind maps. This approach addressed the issues of space and neatness, as digital maps are more flexible, portable, easy to edit, and

simple to save and share (Bhattacharya & Mohalik, 2020). Students also focused on visual design by using curved branches, which are more engaging than straight ones, according to Buzan (2012), and incorporating visual elements such as colors, icons, and images. The other strategies include preparing a summary of the material, creating keywords, and searching for multiple references. Several previous studies have confirmed that preparing concise summaries and generating keywords while constructing mind maps significantly enhances comprehension, organization, and knowledge retention. For example, Solusia (2020) found that students who summarized and highlighted main ideas using mind maps showed improved understanding and retelling of texts. These keyword-based visual representations are consistent with cognitive load theory, which suggests that simplifying and chunking information through keywords reduces working memory demands (Sweller, 2020). Ultimately, searching for multiple references such as digital templates, peer-created examples, or academic content online supports learners in refining their ideas and map designs (Vygotsky, 1978).

CONCLUSION

This study identified several challenges in creating mind maps and strategies for addressing them. From the data obtained, the participants faced several challenges, including unfamiliarity with mind maps, requiring a significant amount of time to create an engaging one, limited space on the mind map, difficulties with using devices and applications for digital mind maps, and creating keywords for the material. To address the challenges, some strategies they used were creating digital mind maps by paying attention to choosing a convenient device and a secure application, using visual elements (colours, images, icons, symbols, etc.), preparing a plan, grouping the material on a mind map, creating an efficient mind map format, using curved branches, preparing a summary of the material to create keywords, and the most important strategy was searching for many references on how to create mind maps properly.

The findings of this study suggest that, although creating mind maps presents particular challenges, with the appropriate strategies and resources, students can effectively develop this skill to enhance their comprehension and organization of learning materials. At the same time, teachers should not only introduce mind mapping as a learning medium but also provide mandatory digital mind mapping training (integrate a short, mandatory training module at the start of the course that focuses explicitly on digital mind mapping best practices, including efficient keyword selection, application features, and visual hierarchy design), provide explicit rubrics and feedback, recommend specific, secure, and feature-rich applications to create mind map in various learning context. Furthermore, this study has several limitations that should be considered for future research, such as a limited scope (the findings may not be broadly generalizable to all university contexts in Indonesia or other countries).

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