INFLUENCE OF MIND MAPPING LEARNING MODEL ON LEARNING OUTCOMES OF THE ANTE-NATAL CARE STUDY COURSE FOR MIDWIFERY UNDERGRADUATE STUDENTS OF ASSOCIATE’S DEGREE EDUCATION

Mika Sugarni¹, Esther Sandra Manapa², Werna Nontji³, Burhanuddin Bahar⁴, Healthy Hidayanty⁵, Prastawa Budi⁶

¹Midwifery Study Program, Graduate School, Hasanuddin University, Makassar
²Marine Science Study Program, Graduate School, Hasanuddin University, Makassar
³Midwifery Study Program, Graduate School, Hasanuddin University, Makassar
⁴Nutrition Science Study Program, Graduate School, Hasanuddin University, Makassar
⁵Nutrition Science Study Program, Graduate School, Hasanuddin University, Makassar
⁶Chemical Study Program, Graduate School, Hasanuddin University, Makassar

ABSTRACT

The learning process consists of activities of lecturers and students, student responses, and characteristics of lecturers; there are significant differences between the mind mapping learning model and the conventional model. New techniques that keep up with the times are also needed in medical education and similar health schools. In this conventional teaching model, much time in class is only dedicated to transferring information from content experts (presenters) to students. This study aimed to analyze the differences in the learning process of the mind mapping model and the conventional model. This study was conducted at Poltekkes Kemenkes Kendari and Stikes Pelita Ibu. According to research by the Department of Education, there is a significant influence on the mind mapping learning model on the learning outcomes of Midwifery Associate’s Degree students. Future researchers are expected to develop this research and look for other aspects related to the application of the mind mapping learning model.

Keywords: Learning model, Mind Mapping, Conventional, Learning Outcomes

I. INTRODUCTION

Medical education and other health schools have undergone a significant overhaul over the decades in the teaching process. The emergence of newer innovation techniques can make us re-consider the role of conventional approaches. In the past, conventional became a common teaching alternative even before the spread of printing. However, recently the lecture method as a method of providing information has received much criticism because it forms students into passive recipients of information (Roopa et al., 2013). This method implies transmitting knowledge in one direction only, thus making students lacking in capturing knowledge and creative abilities in the learning process (Kalyanasundaram et al., 2017).

Too often, teachers ask and dictate to students to memorize, define, describe or understand the facts. Students should be interspersed with tasks to analyze, conclude, synthesize, evaluate, think and rethink the facts and knowledge given (Faisal, Bahadur, and Shinwari, 2016). This conventional teaching method can survive until now, namely the many obstacles that prevent them from adopting new teaching strategies such as insufficient time, limited resources, lack of departmental support, concerns about the scope of teaching content, and related to learning evaluation systems (Deslauriers et al., 2019) so that students are not able to capture the material given. They can only understand concepts and general descriptions (Herbert et al., 2017), and this method is more like an informative-verbalizes transfer of knowledge (Evrekli and Gunay, 2009).

Based on the results of educational research, it indicates that one of the causes of the low quality of learning and student achievement in Indonesia is "Complete Learning," which is a learning process that implies that students can master all competency standards and essential competencies in each subject well. The number of students who
follow the flow of learning without mastering the teacher's material means that we need new learning methods to hone the extent of students' understanding (Usman, 2018). This is also supported by the results of studies that have been carried out in which the study produced data in the form of failure rates in the conventional group with a median of 33.8% and 21.8% in active learning (Freeman et al., 2014).

Realizing this need, the World Federation for Medical Education has a mission to produce professional professionals in their fields and competent with scientific standards. In India, in particular, the Indian Medical Council (Medical Council of India) is now starting to train young medical professionals within the faculty or campus using modern and innovative teaching techniques (Kalyanasundaram et al., 2017). This innovative and active learning system changes the role of the teacher from providing material to facilitating learning experiences, providing feedback as well as information, and initiating ideas (student-centered approach). The result of this approach is that students engage with specific material during class time, which in this way proves to be beneficial for their retention of material, causal mechanisms, and in-depth understanding of the material (Goodman, Barker, and Cooke, 2021).

Currently, there have been many innovative learnings, one of which is the Mind Mapping model. This model is based on a conceptual framework called constructivist learning theory (Antoni et al., 2010). Mind Mapping is a technique that combines images with words to build memory relationships between keywords, color pictures, graphic works, and other forms to highlight key points and enable increased motivation and interest in learning (Wu and Wu, 2020). In addition, it is also able to increase accuracy, credibility, transparency of analysis, and two-way communication (Mammen and Mammen, 2018). This teaching strategy requires students to consciously find and determine which keywords, critical sentences from the material and develop a structural framework of the whole material (Liu and Yuizono, 2020).

The study results stated that mind mapping was superior to the usual face-to-face method seen from the total score of critical thinking tendencies before and after the intervention in nursing students with a score before 263.95 and after intervention 281.68 (Wu and Wu, 2020). The results of his research also show that the skipping rate in the experimental group (mind mapping) is relatively high, almost 70%, while in the control group (conventional), it is lower by almost 30% (Liu and Yuizono, 2020).

II. MATERIALS AND METHOD

Research Location and Design
This research was conducted at Poltekkes Kemenkes Kendari and Stikes Pelita Ibu starting from March 30 to May 6, 2021. This type of research includes quantitative, quasi-experimental research (Quasi-Experimental Design) with a Non-Equivalent Control Group Design research design. This design looks at comparing the achievement between the experimental group (mind mapping model) and the achievement of the control group (conventional model) on student learning outcomes through tests given after all the material has been taught.

Population and Sample
The population in this study were all students of Midwifery Associate’s Degree level 1 to determine the sample using the Slovin formula. In the control group, a sample of 19 students was obtained, but with specific considerations, the researcher took the remaining samples that were not selected so that there were still 20 students. Researchers used a ratio of 1:1, so the experimental group followed the control group as many as 20 students. The total number of samples is 40 students with simple random sampling.

Data Collection
The data collection instruments are learning activity observation sheets, lecturer characteristics and student response questionnaires, informed consent sheets, respondent characteristics datasheets, evaluation test sheets for pretest and posttest.

Data Analysis
To analyze the relationship between respondent characteristics and knowledge using the Chi-Square test and analyze differences in learning activities, student responses, and lecturer characteristics using the Mann-Whitney test and analyze the pretest and posttest effect knowledge on the experimental and control groups using the Wilcoxon test.

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III. RESULT

A. Univariate Analysis

1. Respondent Distribution

Table 1 Distribution of Respondent Distribution

<table>
<thead>
<tr>
<th>Characteristic Respondent</th>
<th>Control</th>
<th>Experiments</th>
<th>Total</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 18 ys</td>
<td>13</td>
<td>65</td>
<td>9</td>
<td>45</td>
</tr>
<tr>
<td>&gt; 18 ys</td>
<td>7</td>
<td>35</td>
<td>11</td>
<td>55</td>
</tr>
<tr>
<td>Original Zone</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sul-Tra</td>
<td>18</td>
<td>90</td>
<td>17</td>
<td>85</td>
</tr>
<tr>
<td>Out Sul-Tra</td>
<td>2</td>
<td>10</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>GPA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 3.00</td>
<td>19</td>
<td>95</td>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>&lt; 3.00</td>
<td>1</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Uji Chi-Square

Table 1 presents data on the characteristics of respondents as many as 40 students divided into two research groups, namely the experimental group and the control group. The number of respondents in both groups was 20 students each. The experimental group was given eight different colored pens with a mind mapping learning model during class meetings, and the control group did not give anything and continued to use the conventional model in the form of the lecture method. The table shows the age of the respondents in the majority experimental group >18 years (55%) and the majority control group ≤18 years (65%) with a p-value of 0.527. The category of respondents from the region is mainly in Southeast Sulawesi (Sul-Tra), in the experimental group as many as 17 students (85%) and the control group as many as 18 students (90%) with a p-value of 0.633. The third category is the student GPA, where the percentages of the two groups are not much different. In the experimental group, all 20 students had a GPA of 3.00 (100%), while the control group had a GPA of 3.00 with 19 students (95%) with a P-value of 0.311. Because the p-value of the characteristics is more significant than 0.05, it can be concluded that there is no difference between age, regional origin, and GPA values in the study sample.

2. Learning Proses

Table 2 Learning Proses Analysis

<table>
<thead>
<tr>
<th>Learning Process</th>
<th>Learning Model</th>
<th>Percentage (%)</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecturer Activities</td>
<td>Mind Mapping</td>
<td>98.91</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td>Conventional</td>
<td>82.58</td>
<td>Good</td>
</tr>
<tr>
<td>Students Activities</td>
<td>Mind Mapping</td>
<td>89.28</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td>Conventional</td>
<td>82.17</td>
<td>Good</td>
</tr>
<tr>
<td>Students Respond</td>
<td>Mind Mapping</td>
<td>83.35</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td>Conventional</td>
<td>68.85</td>
<td>Good</td>
</tr>
<tr>
<td>Students Characteristic</td>
<td>Mind Mapping</td>
<td>96.67</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td>Conventional</td>
<td>83.33</td>
<td>Good</td>
</tr>
<tr>
<td>Learning Fasilitas</td>
<td>Mind Mapping</td>
<td>83.13</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td>Conventional</td>
<td>82.47</td>
<td>Good</td>
</tr>
</tbody>
</table>

The table above shows the questionnaire assessments on variables in the learning process in the two study groups, namely the mind mapping model and the conventional model. Overall, the variables that are considered affect the learning process, lecturer activities, student activities, student responses to the applied learning model, characteristics of lecturers during learning, and existing facilities included in the excellent category.
B. Bivariate Analysis

3. Analysis of Learning Process Differences

Table 3 Differences in the Learning Process of the Mind Mapping Model and the Conventional Learning Model

<table>
<thead>
<tr>
<th>Factor</th>
<th>Category</th>
<th>N</th>
<th>n</th>
<th>Median (Min-Max)</th>
<th>Nilai P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecturer Activities</td>
<td>Mind Mapping</td>
<td>8</td>
<td>3</td>
<td>3.519 (3.385 - 3.577)</td>
<td>0.015</td>
</tr>
<tr>
<td></td>
<td>Conventional</td>
<td>8</td>
<td>2</td>
<td>3.286 (3 - 3.643)</td>
<td></td>
</tr>
<tr>
<td>Student Activities</td>
<td>Mind Mapping</td>
<td>8</td>
<td>20</td>
<td>73.25 (60.85 - 74.9)</td>
<td>0.021</td>
</tr>
<tr>
<td></td>
<td>Conventional</td>
<td>8</td>
<td>20</td>
<td>49.92 (41.5 – 52.9)</td>
<td></td>
</tr>
<tr>
<td>Student Response</td>
<td>Mind Mapping</td>
<td>1</td>
<td>20</td>
<td>82.5 (75 - 99)</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Conventional</td>
<td>1</td>
<td>20</td>
<td>69.5 (59 - 82)</td>
<td></td>
</tr>
<tr>
<td>Lecturer Characteristic</td>
<td>Mind Mapping</td>
<td>8</td>
<td>3</td>
<td>29 (28-30)</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>Conventional</td>
<td>8</td>
<td>2</td>
<td>27 (24-29)</td>
<td></td>
</tr>
<tr>
<td>Learning Facilities</td>
<td>Mind Mapping</td>
<td>1</td>
<td>20</td>
<td>96.5 (79-108)</td>
<td>0.841</td>
</tr>
<tr>
<td></td>
<td>Conventional</td>
<td>1</td>
<td>20</td>
<td>94.5 (79-108)</td>
<td></td>
</tr>
</tbody>
</table>

Uji Mann-Whitney

The table shows the results of the analysis of differences in the learning process using the Mann Whitney test to see the difference in the median value of each variable with the number of meetings (N) 8 times and taking student response data and learning facilities one meeting, meaning that it was carried out one day at the last meeting in both groups learning. The number of respondents (n) was 20 students in each group, plus three lecturers from the mind mapping group and two lecturers from the conventional group.

Table 3 shows data related to the analysis results on the differences in the learning process of the experimental group and the control group during eight meetings with each group of 20 students. In the activities of lecturers and student activities in the two groups of learning models, the p-value is smaller than 0.05. The p-value is 0.015, which means a significant difference between the mind mapping learning model and the conventional learning model. Similarly, student activities have a p-value of 0.021, which is not more than 0.05, so it can be concluded that there are significant differences between student activities in the mind mapping and conventional groups. Student responses to the learning model applied during the learning process where the p-value is 0.000 means a significant difference between mind mapping and conventional. The lecturer characteristics variable also has a p-value that is smaller than 0.05, which is 0.003, so it can be concluded that there are significant differences between the characteristics of the lecturers in the mind mapping model and the conventional model. Finally, the learning facilities obtained a p-value greater than 0.05, namely 0.841, which means no difference in facilities in the mind mapping group and the conventional group. Overall, it can be concluded that there are significant differences in the learning process to the mind mapping learning model and the conventional learning model with four variables that have a p-value of 0.05.


Table 4. The Effect of Mind Mapping and Conventional Learning Models on Pregnancy Midwifery Care Courses on Learning Outcomes of DIII Midwifery Students

<table>
<thead>
<tr>
<th>Instructional Model</th>
<th>Category</th>
<th>N</th>
<th>Median (Min-Max)</th>
<th>Difference</th>
<th>Nilai P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mind Mapping</td>
<td>Pretest</td>
<td>20</td>
<td>42.855 (25.713-62.854)</td>
<td>45.712</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Posttests</td>
<td>20</td>
<td>88.567 (68.568-94.281)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conventional</td>
<td>Pretest</td>
<td>20</td>
<td>34.284 (22.856-42-855)</td>
<td>37.141</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>post-tests</td>
<td>20</td>
<td>71.425 (62.854-91.424)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Uji Wilcoxon

In table 4 is the result of the Wilcoxon test, where the table above is to see the comparison or difference in the learning outcomes of the mind mapping group (experimental group) and the conventional group (control group). The pretest result of the mind mapping group has a median value of 42,855, which is higher than the pretest value of the conventional group, which is only 34,284. The same is the case with the post-tests median value results, where the mind mapping group was higher at 88,567 while the conventional group had a post-tests median value of 71,425. When viewed from the difference in learning outcomes, the mind mapping group was higher than the conventional group. In the mind mapping group, the difference between the pretest and posttest scores was 45,712, while the conventional group had a difference of 37,141.

The p-value column shows that the p-value is smaller than = 0.05 for conventional and mind mapping models. This means that there is an influence on the mind mapping learning model on improving student learning outcomes of DIII Midwifery so that the result is H0 is rejected and Ha is accepted. Likewise, conventional learning models also influence student learning outcomes. So, it can be concluded that both mind mapping and conventional models affect the learning process. However, judging from the median difference, the mind mapping model has a much higher difference, so it can be said that the application of the mind mapping model has better effectiveness than the conventional model.

Chart 1 shows an increase in knowledge of the learning outcomes of DIII Midwifery students in the experimental group and the control group.

IV. DISCUSSION

This study changed the system where initially the lecturer was entire as a provider of information to students as information providers and lecturers as a complement (flipping classroom) to be able to capture the material taught as in higher education which should provide a student-centered learning approach (Betihavas et al., 2016).

The learning process is a process that contains a series of implementations by teachers and students based on reciprocal relationships that take place in educational situations to achieve specific goals. This interaction or reciprocal relationship between teachers and students is the main requirement for the ongoing learning process (Fakhrurrazi, 2018). The learning process in this study is a learning activity that includes lecturer and student activities, student responses, and lecturer characteristics.

In table 2, the lecturer's activities during a teaching in the classroom. Lecturers as supervisors are expected to create strategic conditions that can make students comfortable following the learning process and creating conducive interactions (Fakhrurrazi, 2018). In the lecturer activity for the experimental group, the students were formed into several groups; then, the lecturer distributed different materials to be discussed together. Group members make mind maps based on the material and the results of joint discussions and then present them using mind mapping either on PowerPoint or directly on the blackboard. Lecturer activities here help direct students in preparing mind mapping so that the teacher creates a comfortable atmosphere by trying two-way communication and the simple teaching technique as if telling a story and the mind map directed by the lecturer makes students enthusiastic. This is evidenced by the questionnaire results where the mind mapping lecturer activity has a median value of 3,519, while for the control group lecturer activity, the conventional model is not much different from the value of 3,286. Then the p-value for this lecturer activity is less than 0.05, which is 0.015. From the average value and p-value, it
can be concluded that there are significant differences in the activities of lecturers in the mind mapping learning model and the conventional model.

The success of a model or learning media and how to teach lecturers depends on the characteristics of the students. This characteristic is intended to accept student material in the teaching and learning process in the classroom (Fitriyani, Fauzi, and Sari, 2020). In student activities, it is also seen how much they are motivated to participate in ongoing learning (Lee and Martin, 2017). This is also shown from research which explains that motivated students are more likely to do challenging activities, be actively involved, enjoy the process of learning activities, and show increased learning outcomes, perseverance, and creativity (Samir Abou El-Seoud et al., 2014). Other studies also say that lecturers give attention and appreciation to students to feel supported and become more active (Vartak et al., 2017).

Students conduct small discussions among group members to develop a mind map according to their creativity. They were starting by making pictures, charts, graphics / other lines. In this process, students will maximize the performance of their brains to create a mind map that is different from the others. Usually, students designing mind map designs will tend to ask the lecturers to create a two-way interaction. This is evidenced by the median value of the questionnaire of 73.25. While in the control group student activities, some of them followed the learning process well, and some of them in the middle of learning time should not be taken. The obstacles experienced, such as the concentration of students when participating in the learning process, did not last long, they tended to be busy alone, when discussing, students tended to joke or chat with their friends, and when the teacher explained the subject matter, students quickly felt bored, and the motivation to study was low (Murda and Purwanti, 2017). The result of the questionnaire score is slightly lower than the experimental group, which is 49.92. However, overall, student activities in both groups were categorized as good. The p-value shows = 0.05, which is 0.021, which means a significant difference in the mind mapping learning model and the conventional model in the student activity variable.

The response is a response or feedback to the communicant from interpreting the response or response to a message that has been conveyed. The results of this response have two forms, namely pleasure or hatred (Putri and Noor, 2013). For this reason, it is necessary to assess student responses about the learning carried out. The survey method was used to explore student responses about learning, and the system or model applied (Benson, Szucs, and Taylor, 2016).

The student responses intended in this study were student responses related to how the lecturer taught, the learning model used, the effects during teaching and learning, and the results obtained after applying the learning model. Student responses in the experimental group, namely the mind mapping learning model, had a median value of 82.5, meaning that many students were happy and enthusiastic about the mind mapping learning model. While in the control group with the conventional learning model, the median value was 69.5; this indicates several points in the student response questionnaire that did not occur properly. This difference in value is supported by the value of = 0.05 and the p-value of 0.000. The data can be concluded that there are significant differences in student responses to the mind mapping learning model and the conventional model.

The presence of universities where lecturers serve is to serve students in the sense of providing information. On the other hand, students have their expectations of the quality of lecturers. In other words, students have specific criteria regarding the professionalism of the lecturers who teach them (Simarmata, 2016). In general, the assessments seen in the characteristics of this lecturer are time discipline, how to speak, mastery of the material, broad insight, teaching skills, evaluation skills, good looking, and good report cards (Simarmata, 2016). The questionnaire results showed 96.67%, while in the conventional group, it was 83.33%. When viewed from the median of the two groups, the mind mapping group was two points superior, namely 29, compared to the conventional group, which was 27. In the Mann Whitney test results, the results for the characteristics of this lecturer were = 0.05 with a p-value of 0.003. So, the researcher concludes that there is a significant difference between the mind mapping learning model and the conventional model in this variable.

In the learning activity variables, namely lecturers and students, student responses, and lecturer characteristics, the comparison value is visible, and there is a significant difference between the mind mapping model and the conventional model. Of course, this is by existing theories and in line with previous research. So the conclusion is that the value of the variable or factor of lecturer and student activities, student responses, and lecturer characteristics affect the learning process. At the same time, the results of the analysis on learning facilities are not
in line with the results of research (Wulandari and Muhiddin, 2019), which states that there is an effect of using learning facilities on student learning achievement. The results of this study are not following the existing theory where facilities are one of the main factors to achieving a good learning process.

After performing statistical tests on the pretest and posttest scores in the two groups, namely the mind mapping model and the conventional model, it showed a difference in values in the two groups. The median value of the pretest in the mind mapping group was 42.855, while the conventional group was 34.285. In the posttest, the median value for the mind mapping group was 88.567, while the conventional group was 71.425. The p-value with = 0.05 indicates a value of 0.000 in both mind mapping learning models and conventional models. This means that both the conventional and mind mapping models affect student learning outcomes. However, if seen from the value of the distribution of data in the learning process and the number and median difference of the two groups in the learning outcomes of the mind mapping learning model, it is much higher than the conventional model. So it can be concluded that the application of the mind mapping model in the course of maternity midwifery care to the learning outcomes of midwifery DIII students has better effectiveness than the conventional model because the mind mapping group experienced an increase in mastery of learning materials evenly marked by all respondents successfully exceeding the KKM score of 68, students are more communicative, enthusiastic and creative in compiling the material on their notes and students are more like and happy with the mind mapping model in terms of the results of student response questionnaires.

Conclusion and suggestion

The learning process consists of activities of lecturers and students, student responses, and characteristics of lecturers. There are significant differences between the mind mapping learning model and the conventional model. In learning facilities, there is no difference between the conventional and mind mapping models. From the evaluation results, it can be concluded that the mind mapping learning model affects the learning outcomes of DIII Midwifery students and conventional learning models. When viewed from the difference in the median value of the two groups, the mind mapping model is superior and far above the conventional learning model. So, it can be concluded that the application of the mind mapping model in maternity midwifery care on the learning outcomes of DIII Midwifery students has better effectiveness than the conventional model.

Future researchers are expected to develop this research and look for other aspects related to the application of the mind mapping learning model.

BIBLIOGRAPHY


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