

The Use of Mind Mapping to Understand Question Words of Hearing-Impaired Students

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Abstract: The research aims to determine the effect of mind mapping method on increased understanding of question words of first grade elementary school students with hearing impairments in the special school for hearing-impaired students in Indonesia. Mind mapping method is one of the visual-based methods to focus the mind into a form of diagram that contains themes, subthemes, and important parts of a piece of information. This research used quantitative approach with experimental method and one group pretest-posttest design. It was conducted to seven first grade elementary school students with hearing impairments with three treatments. Data were collected through written tests. The data were then analyzed with quantitative analysis techniques using nonparametric statistics, i.e. Wilcoxon test. The results of this research show that mind mapping method had an effect on increased understanding of question words of the first-grade elementary school students with hearing impairments in the special school for hearing-impaired students. The implication of this research is that teachers are expected not to hesitate to apply the mind mapping method in helping to improve hearing-impaired students' understanding of question words.

1 INTRODUCTION

Based on preliminary observations conducted to the first grade of a special elementary school for hearing-impaired students in Indonesia, communication problems were discovered, one of which was found in the questioning activity. Questioning activity becomes one of the learning stages at all grade levels using a scientific approach. According to the Regulation of the Minister of Education and Culture No. 81A of 2013, appendix IV, Curriculum 2013, there are two models of learning process that have been developed, namely direct and indirect learning processes. Direct learning is the process of education to develop knowledge, thinking ability, and psychomotor skills through direct interactions with learning resources designed in the syllabus and lesson plans in the form of learning activities. Indirect learning is the process of education that occurs during the process of direct learning, but it is not designed in special activities. In direct learning, learners learn to observe, ask questions, collect information, associate or analyze, and communicate their findings. In the questioning

stage in the classroom, students are required to make inquiries based on observations made in the previous stage, and it is at this stage that hearing-impaired students have difficulty because they still do not know about the types and uses of question words. Understanding the use of question words is very important to align the perceptions of the person who asks and the person being asked, or between the communicant and communicator. Disagreement between a communicant and communicator about the question words will cause the information given or received to be irrelevant.

Question words are words used to form interrogative sentences (Ramlan, 1985). Question words include what, who, when, where, where to, where from, how much, how, and why. In the questioning activity, there are some components that must be understood in advance by students, including the types of question words, uses of question words, differences in question words, structure of interrogative sentences, and the like. They have to be familiar with the components for making simple questions; for example, the question word "who" serves to show people, the question word "what" serves to show things, the question

word “when” functions to indicate time, and so on. Based on these problems, efforts should be made to increase the understanding of the question words.

One of the efforts assumed to be able to increase the understanding of question words of hearing-impaired students is a visual learning method that maximizes the visual sense of hearing-impaired students, who are often referred to as visual people. This is in line with the opinion of Bunawan and Yuwati (2000: 5) who explained that in the hearing impaired, "the visual sense will take an important role, followed by the senses of touch, smell, and taste." Thus, hearing-impaired people will more easily receive information or learning by maximizing their visual sense. The visual learning methods in question are, one of them, the mind mapping method. Musrofi (2008: 179) defined mind mapping as “a technique in the form of a scheme to describe everything we think about or have in our brain”. Mind mapping is also one of the ways teachers use to assist students in focusing their concentration and organizing learning materials to be easily understood by students.

There are several journal articles that are relevant to the use of mind mapping. First, there is the article written by Kernan et al. (2017) which suggested that by constructing mind maps, students can develop structured research questions and a list of major search terms that form the basis for literature review and questionnaire development for descriptive research. Second, Jimenez (2017) argued that mind maps can be used to understand autistic conditions, which include: the brain that has different abilities, repetitive behavior, and limited communication. He added that intelligence in different aspects is conserved, and there is isolation or little social interaction. Third, the article written by Dutt (2015) shows that mind maps are effective as a thinking tool, and there is an opportunity to use mind mapping in adding values into and effectiveness in managing projects. Fourth, the article written by Shallcross (2016) demonstrates that concept maps are useful tools for assessing knowledge and understanding of sustainable development concepts and the students surveyed in the research had a good awareness of the technical, social, and environmental aspects of the domain. Fifth, in the article written by Enright and White (2012), it is explained that mind mapping can be used to clarify and simplify the complex problems of pharmaceutical department. Mind maps are used to shape, visualize, produce, categorize, and classify ideas, as well as assist in various activities including problem solving, writing, and critical decision

making. Sixth, the article written by Ginting (2013) shows that the mind map model is effective in improving the ability of writing articles of eleventh grade high school students. Seventh, the article written by Rejeki et al. (2014) indicated that the use of mind mapping model can improve the process and learning outcomes of social studies of the fourth-grade students of elementary school. Eighth, the article written by Salfina and Pasaribu (2015) demonstrates that the achievements of students who were taught using the mind mapping method were better than those of the students taught by conventional methods.

Of the various journal articles found, none has examined the application of mind mapping method to increase understanding of question words of hearing-impaired students. Therefore, there is a need for research to determine the effect of mind mapping method on hearing-impaired students' increased understanding of question words.

2 METHODS

This research used quantitative approach with experimental method. It employed the one-group pretest-posttest design. The design is as follow in table 1:

Table 1: One-group pretest-posttest design.

| Pretest | Treatment | Posttest. |
|----------------|-----------|----------------|
| O ₁ | X | O ₂ |

(Noor, 2011, p. 115)

Notes:

In this design, there is no control group.

O1 = Measurement before treatment

X = Treatment

O2 = Measurement after treatment

At the measurement stage, students were given a test with the same instrument. The test was given to uncover their understanding of the use of such question words as “what”, “who”, “when” and “where”. The test includes: a complete test of the function of the question words (what, who, when, and where); matching the questions with the right answers; completing interrogative questions with the right question words, and answering simple questions.

At the treatment stage, a teaching and learning on the use of the question words (what, who, when, and where) was carried out, using the method of mind mapping. The steps to make the mind map referenced Buzan (2011), namely: (1) The activity starts from the middle of a blank page to the side; (2)

As the central idea, the child’s photo is used with a question mark, so that the child can stay focused and concentrate. In mind mapping, a variety of colors are used to make the mind maps more alive and fun; (3) The child connects the main branches to the central image, then connects the second and third level branches to the first and second levels, because the brain works according to the association. In its application in the present research, the subjects were guided to read the main part of the mind mapping, and then together connected the main part with the branches of understanding, type, function, characteristic, and example of the question words; (4) The child creates a curved line; (5) The child uses one keyword for each line; and (6) Each keyword has a picture to make it easier to remember the mind maps. In the implementation in the research, the mind maps were made through computer applications.

In this research, the samples were taken by nonprobability sampling with surfeited sampling technique. The samples included all (seven) first grade hearing-impaired students, at one of the special schools in Indonesia. The description of the samples can be seen in table 2.

Table 2: Research sample.

| No | Name Initial | Gender (year) | Hearing loss level (dB) | |
|----|--------------|---------------|-------------------------|------|
| | | | Right | Left |
| 1 | Ab | man | 8 | 100 |
| 2 | Al | woman | 9 | 90 |
| 3 | Ar | man | 7 | 90 |
| 4 | Bo | man | 8 | 100 |
| 5 | Da | man | 9 | 90 |
| 6 | Mu | woman | 9 | 100 |
| 7 | Ra | woman | 7 | 90 |

Table 2, indicated that students who become research samples experience hearing loss at the level of profound, so classified as deaf person. In general, they can read and write simple sentences.

Data collection was done by using the test technique, namely a written test on the use of question words (what, who, when, and where). The test is in the forms of completing sentences, matching items, and short answer questions. In the implementation, the students were assisted by using total communication to clarify the questions asked.

3 RESULTS AND DISCUSSION

The research aims to obtain a description of the effect of mind mapping method on increased understanding of question words of hearing-

impaired students. Therefore, it required data in the forms of pretest and post-test scores for comparison. The results can be seen through the difference between the pre-test and post-test scores, or the difference between the scores of understanding question words before and after treatment. The difference between the pre-test and post-test scores can be seen in table 3.

Table 3: Difference between the pre-test and post-test scores of understanding question words.

| No | Research sample | Pretest scores | Posttest scores | Difference |
|-------------|-----------------|----------------|-----------------|------------|
| 1 | Ab | 7 | 13 | 6 |
| 2 | Al | 10 | 14 | 4 |
| 3 | Ar | 5 | 13 | 8 |
| 4 | Bo | 5 | 9 | 4 |
| 5 | Da | 7 | 15 | 8 |
| 6 | Mu | 10 | 18 | 8 |
| 7 | Ra | 8 | 14 | 6 |
| Total | | 52 | 96 | 44 |
| Average (%) | | 37.14 | 68.57 | 31.43 |

Table 3 indicates there was a significant difference in the hearing-impaired students’ understanding of question words before and after getting treatment. The average ability of the students in the pre-test was 37.14%, while the average ability of the students in the post-test increased to 68.57%, so the average percentage of students’ understanding of question words increased by 31.43%.

The data that were obtained then processed using quantitative analysis techniques, more specifically using non-parametric statistical test (Wilcoxon test). Meanwhile, the significance level used was $\alpha = 0.05$. Based on the calculation of total absolute value taken (the smallest one), $J_{count} = 0$. The value of J in the table or J_{table} with a significance level of $\alpha = 0.05$ and sample number $(n) = 7$, was 2. Based on the hypothesis testing criteria previously set, if the value of $J_{count} < J_{table}$ is $0 < 2$, then H_0 is rejected and H_1 is accepted. This means that the proposed hypothesis was accepted, and it can be concluded that the mind mapping method had a significant effect on increasing the understanding of question words of the hearing-impaired students of the first grade of a special elementary school in Indonesia.

Based on the results explained above, it is found that the hearing-impaired students’ understanding of question words experienced significant progress due to the use of mind mapping method compared to before the students were taught with the method. Thus, the hypothesis formulated in this research, which is “mind mapping method has an effect on the increased understanding of the question words of the hearing-impaired students in the first grade of a

special elementary school” is accepted. This is in accordance with the Wilcoxon test results which determines that when $J_{count} < J_{table} = 0 < 2$, then H_0 is rejected and H_1 is accepted. In addition, the average test score obtained by each student increased after the students were given treatment through the mind mapping method. This can be seen from the comparison of the pre-test and post-test results for each student as presented in table 2, which reinforces the acceptance of the proposed hypothesis.

The explanations show that in an attempt of increasing hearing-impaired students’ understanding of question words, the learning methods used by teachers by considering students’ needs and conditions are very influential. This is in line with the argument of Barizi and Idris (2010: 119) that “in using a certain method, considerations of students’ condition should be made, including considerations of their intelligence level, maturity, learning style, individual differences, and so on.”

Still based on the research results, the mind mapping method is significantly influential in increasing hearing-impaired students’ understanding of question words because this method is visually based. Visual-based methods are very suitable for hearing-impaired students, who because of their hearing impairment, rely so much on their vision to understand various pieces of information, thereby making them earn the nickname of “visual people.” This corresponds to Myklebust’s argument (in Bunawan and Yuwati, 2000: 5) that in hearing-impaired people who are classified as deaf, the visual sense will take the most important role, followed by the senses of touch, smell, and taste.

The results of this study prove that the mind mapping method significantly affected the increased understanding of the question words of hearing-impaired students; therefore, teachers should not hesitate to apply the method. This research examined the implementation of the mind mapping method to increase the understanding of question words related to the subject of Indonesian language among hearing-impaired students. Future research is suggested to examine the application of mind mapping method to increase other abilities, such as material understanding on the subject of natural sciences.

4 CONCLUSIONS

The results of this research show that the mind mapping method had a significant effect on increased understanding of question words of hearing-impaired students. The question words

included what, who, when, and where. The increase was based on the average post-test score obtained by the students which shows a significant increase compared to the average pre-test score. This increase is very possible to achieve, because mind mapping is one method that is based on vision, appropriate for hearing-impaired students who are often referred to as visual people. The visual-based method is perfect for hearing-impaired students, because for them the visual sense serves a very important role in the limited ability of interpreting language as the impact of their hearing impairment.

This research is very important to do in order to show that the method of mind mapping is effective to improve the understanding of hearing-impaired students of question words. Therefore, teachers need not hesitate to use this mind mapping method, especially in improving the understanding of the question words for hearing-impaired students. Based on the results of this study, it can be concluded that the results of this study support the proposed hypothesis.

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