



Students' creative thinking ability assisted augmented reality based on visualizer-verbalizer cognitive style

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Abstract

Creativity is the highest order of thinking, which leads students to generate new ways to find a solution to many unpredictable problems in the future. Although there are many studies on creative thinking ability, no research focused on augmented reality and visualizer-verbalizer cognitive style in creative thinking ability. This study aims to describe creative thinking ability assisted with augmented reality view from visualizer-verbalizer cognitive style. This study used a qualitative descriptive approach. The subjects of this study were selected four students' 52 from the 10th grade. The process of selecting this subject was analyzed by the Rasch Model analysis using Winsteps software version 3.73. The data were collected using Visualizer-Verbalizer Questionnaire (VVQ), a creative thinking ability test assisted with augmented reality and interview. The final scale from the visualizer scale has a Cronbach alpha value of 0.67, while the verbalizer scale has a Cronbach alpha value of 0.66. The results show that the visualizer students meet all the indicators of creative thinking ability: fluency, flexibility, originality, and elaboration. While the verbalizer students only meet fluency indicators or fluency and originality indicators in creative thinking ability. Therefore, based on this research analysis, teachers can pay more attention to the students' cognitive style in creative thinking ability.

Keywords: augmented reality; cognitive style; creative thinking ability

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Introduction

Creativity is the highest order of thinking, which leads students to generate new ways to find a solution to many unpredictable problems in the future (Fatah et al., 2016; Prihatiningsih & Ratu, 2020; Widana & Septiari, 2021). We know that creativity plays an essential role in high thinking level mathematical and creative thinking plays an essential role in life that is one of human ability (Puspitasari et al., 2019). The creative thinking ability possessed by students is one of the goals of mathematics (Ginting et al., 2019). Some aspects of creative thinking ability include fluency, flexibility, originality, and elaboration (Swandewi et al., 2019; Wahyudi et al., 2019). Students' abilities are different from each other, which is students' creativity is needed to express new ideas (Sari & Prabawanto, 2019; Siswono, 2010, 2011).

The problem showed that students could not improve their creative thinking ability because not all mathematics lessons provide opportunities for that, especially the thinking ability of male students was lower than that of female ones (Wahyudi et al., 2019). Even though becoming creative is one of the objectives of Indonesian education (Wahyudi et al., 2019). Also, creative thinking has been stated in learning mathematics in the document of the 2013 curriculum (Fatah et al., 2016). However, implementing classroom learning is still far from what is expected to show students' creativity (Anggraini & Zulkardi, 2020; Waluyo et al., 2020). The learning process and student learning outcomes in creative thinking ability are still affected by how the teacher presents the information (Yeh et al., 2019). Teachers tend to teach conventionally, and domination makes the students only listen and solve the problem just as the way the teacher does, which causes passive learning to be unable to explore students' creative ideas (Fatah et al., 2016; Fatmawati, 2016; Lince, 2016; Widana & Septiari, 2021).

This condition needs to be educated seriously. A change is necessary for packing an appropriate learning model (Wahyudi et al., 2019). Need to know that every student has different abilities to understand mathematics (Hadar & Tirosh, 2019). Teachers commonly focus on the learning system and ignore students' cognitive styles (Tambunan, 2016). Whereas solving the problem with many strategies in creative thinking ability is more influenced by cognitive style (Sari & Prabawanto, 2019).

Cognitive style is an important thing to improve student creativity (Miller, 2007). Characteristics or habits in learning are also called cognitive styles (Faradillah, 2018). It can be said that cognitive style has an important role in learning, especially in mathematics learning (Sari & Prabawanto, 2019). Cognitive style is one factor that causes students to have different ways of organizing and processing information (Sari & Prabawanto, 2019). According to this, incoming information is processed in two ways visually and verbally. Visualizer and verbalizer cognitive styles influence learning with text and pictures (Koc-Januchta et al., 2017). Visualizers use pictures to process information, whereas verbalizers use a preferred word (Thomas & McKay, 2010). In visualization mathematics, one technology can also be applied as a medium of learning in education today, namely Augmented Reality (AR).

Augmented Reality (AR) visualizes digital content in real-time and has become the newest technology used in learning or practice classes (Clini et al., 2014; Pujiastuti & Haryadi,

2020). Users in this process could interact with virtual 3D objects in a real scenario because this connects virtual objects with the real world (Cai et al., 2020; Chen et al., 2013; Qumillaila et al., 2017). Besides providing a new experience, AR technology offers multiple benefits that positively affect students' learning (Bujak et al., 2013; Cahyono et al., 2020; Del Cerro Velázquez & Méndez, 2021). This technology is a visualization that can be used in learning mathematics, and the visualizer's cognitive style emphasizes more images. Moreover, the cognitive style has an important role in increasing creativity. There is no doubt that AR technology effectively could improve students' interests which could help them build better learning (Nincarean et al., 2013; Sahin & Yilmaz, 2020).

Based on the explanation above, creative thinking has different stages in every student's learning process. With visualizer-verbalizer cognitive style cannot be determined, which is excellent because both have their characteristics. Learning with AR turns out to produce different outcomes. Research (Sophocleous, 2013) about creative mathematical abilities revealed that students use different strategies in creative math tasks depending on different cognitive style tendencies. Koć-Januchta et al. (2017) research about visualizers versus verbalizers found that visualizers inspect the pictures more than verbalizers more significantly inspect the word. Furthermore, research is concerned with Augmented Reality, findings successfully designed in the educational program given meaningful mathematical experience for students (Cahyono et al., 2020). Moreover, the research about probability learning in mathematics using augmented reality (Cai et al., 2020), it can be concluded that AR-based applications are a series of positive learning because they would be helpful for students' learning gains and students' attitudes.

Although there are many studies on creative thinking ability, no one has yet discussed the visualizer-verbalizer cognitive style using augmented reality on creative thinking ability. The researchers want to study more about creative thinking ability, augmented reality, and visualizer-verbalizer cognitive style. Therefore, this study analyzes students' creative thinking ability with augmented reality viewed from visualizer-verbalizer cognitive styles.

Methods

The method used in this research is the descriptive qualitative approach. This research was conducted in class 10th grade at Prestasi Prima Senior High School. The subject was taken by purposive sampling, choosing 52 students, which consisted of 29 male students and 23 female students.

The research data were taken by questionnaire, test, and interview. The cognitive style test in this study used Visualizer-Verbalizer Questionnaire (VVQ), which has been tested for its validity and reliability. The final scale from the visualizer scale has a Cronbach alpha value of 0.67, while the verbalizer scale has a Cronbach alpha value of 0.66. The questionnaire consisted of ten items for visualizers and ten items for verbalizers to get subjects with different cognitive characteristics. Table 1 shows the grouping of the cognitive styles of visualizer-

verbalizer. The words VB and VS in this table had different meanings. VB, which means verbalizer, and VS which means visualizer.

Table 1. Visualizer verbalizer cognitive style grouping

Score	Cognitive Style
$VB \geq 40$ and $VB - VS \geq 20$	Verbalizer
$VS \geq 40$ and $VS - VB \geq 20$	Visualizer
$VB \leq 40$ and $VS \geq 40$ or $VB - VS \leq 20$	Negligible

The test of creative thinking ability consists of four indicators: fluency, flexibility, novelty, and elaboration. This test of creative thinking ability assisted with augmented reality. The test of the creative thinking ability and augmented reality application has been validated by content validity and was carried out by three expert lecturers with some changes form of errors, suggestions, and comments such as improvements to the use of words and the addition of mathematical symbols. The data are collected in Ms. Excel and analyzed with the Rasch Model using the Winsteps software version 3.73 (Chan et al., 2021). The Rasch model is only used to determine the high, medium, and low levels of creative thinking.

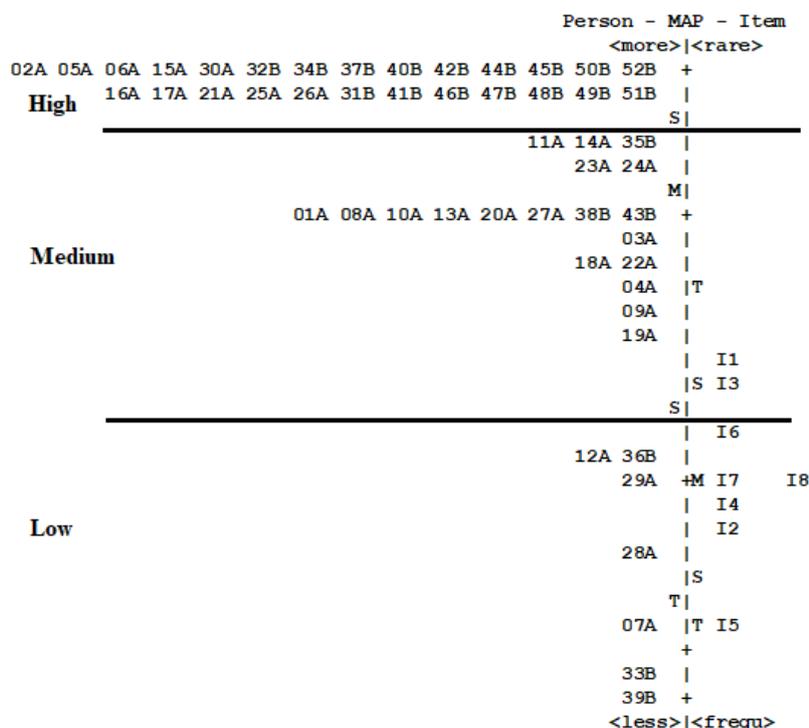


Figure 1. Wright maps (person-item) Winsteps

The result of the creative thinking ability in the item section of figure 1 shows three categories. 26 students are in the high category, 19 are in the medium category, and seven are in a low category. First, subjects were specified based on the type of cognitive style, visualizer-verbalizer, and creative thinking ability. Subjects were then selected based on the creative thinking ability categories, as seen in table 2. The subject in table 2 used the abbreviation name, and the code has different meanings for each other. For example, the code Vs1 means subject visualizer number one and Vs2 for subject visualizer number 2. Meanwhile, Vb1 means subject verbalizer number 1 and Vb2 for subject verbalizer number 2.

Table 2. Creative thinking ability category

No	Cognitive	Subject	Interpretation	Code
1	Visualizer	ARN	High	Vs1
2	Visualizer	AF	High	Vs2
3	Verbalizer	NAA	Medium	Vb1
4	Verbalizer	DOS	Low	Vb2

Subjects who had been selected took the creative thinking ability test. The instruments consisted of 8 questions of trigonometric that were suitable for use after being validated by the experts. After taking the creative thinking ability test, the researcher interviewed the students. The purpose of the interview is to determine the students' creative thinking ability, which is cognitive in visualizers and verbalizers. Researchers do not ask the same questions for each subject but depend on the amount of information the researcher needs.

Results

The Visualizer-Verbalizer Questionnaire (VVQ) results show that students' cognitive styles have differences between visualizers and verbalizers. The four subjects were selected according to their cognitive style. The researcher then analyzed the students' creative thinking ability assisted with augmented reality.

The use of augmented reality requires a cellphone camera and a learning application that is adapted for augmented reality. This camera scans a barcode which will display the image on the screen of the students' mobile devices. The use of augmented reality technology is used in questions number four, five, and six. The research results will be described following the indicators of creative thinking ability.

Fluency

In the fluency indicator, figure 2 shows the answers from the visualizer and verbalizer students at number one. In contrast, figure 3 shows the answers from the visualizer and verbalizer students at number two.

(a)

$$1 + \cot^2 A = \operatorname{cosec}^2 A$$

$$1 + \cot^2 (A)^2 = \operatorname{cosec} (A)^2$$

$$1 + \operatorname{cosec} (A^2) - 1$$

$$\operatorname{cosec} (A)^2$$

$$\operatorname{cosec}^2 A = 1$$

$$\operatorname{cosec}^2 A = \operatorname{cosec}^2 A$$

(b)

$$1 + \cos^2 A : \operatorname{cosec}^2 A$$

$$\rightarrow 1 + \cot^2 A = \operatorname{cosec}^2 A$$

$$1 = \operatorname{cosec}^2 A - \cot^2 A$$

$$1 = 1$$

Figure 2. (a) Visualizer answer (b) Verbalizer answer

Based on the figure 2 results of the visualizer student's answer for question number 1, subjects Vs1 and Vs2 can answer more than one solution with the correct clear solution. The

student could do the problem fluently since the students can generate many problems with correct solutions. The answers are different when they have different concepts or formulas.

R : Do you understand question number 1 ? And how did you finish more than one answer? Explain to me.

Vs1 : Yes, I finish it according to the command question, and for the first step, I change $\cot^2 A$ to $\operatorname{cosec}^2 A - 1$ and the second step, I change $\cot^2 A$ to $\cos^2 A / \sin^2 A$, so I get the same answer is $\operatorname{cosec}^2 A = \operatorname{cosec}^2 A$.

Vs2 : Yes, I understand. I answered the question by flipping through the formula miss. For the first step, I change $\operatorname{cosec}^2 A$ to $\cot^2 A + 1$, and in the second step, I change $\operatorname{cosec}^2 A$ to $\operatorname{cosec}^2 A - \cot^2 A$, I also thought of other ways besides the first and second way, that is to change $\operatorname{cosec}^2 A$ to $1/\sin^2 A$.

Meanwhile, the results of the verbalizer student's answers for questions 1, Vb1 and Vb2 can only answer one solution with the correct answer.

R : Do you understand question number 1? Explain to me.

Vb1 : Yes, prove trigonometric identity.

Vb2 : Prove trigonometric identity that $1 + \cot^2 A = \operatorname{cosec}^2 A$.

R : Was the problem has many different solutions? If there was, what is it?

Vb1 : I think yes, but I don't know.

Vb2 : I don't know, miss.

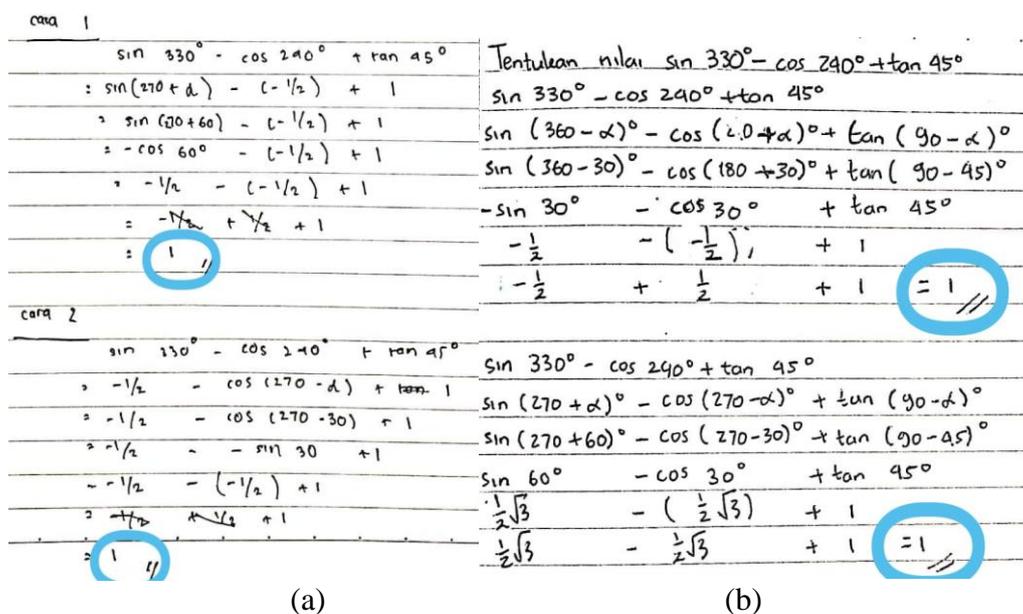


Figure 3. (a) Visualizer answer (b) Verbalizer answer

Based on the figure 3 the results of the visualizer student's answer for question number 2, subjects Vs1 and Vs2 can answer more than one solution with various answers correctly.

R : Do you understand question number 2 ? And how did you finish more than one answer? Explain to me.

Vs1 : Yes I understand, and I used that way because that is easier. And I'm using quadrant miss.

Vs2 : For number two, it uses quadrant miss. So for the first way, I change $\sin(330^\circ)$ to $\sin(270^\circ + \alpha)$, then for the second way, I change $\cos 240^\circ$ to $\cos(270^\circ - \alpha)$.

In addition, the results of the verbalizer student's answer for question number 2 in figure 3, Vb1 and Vb2 also give more than one solution. It shows that verbalizer students also met indicator fluency.

R : Do you understand question number 2?

Vb1 : For number two, I'm using the quadrant to find the answer miss.

Vb2 : I'm using quadrant to change sin and cos, and then I'm using the table of trigonometric.

Flexibility

In the flexibility indicator, figure 4 results from the answers from the visualizer and verbalizer students at number three. In contrast, figure 6 shows the answers from the visualizer and verbalizer students at number four. Figure 5 is the picture of augmented reality for number four.

(a) Visualizer Answer

(b) Verbalizer Answer

Figure 4. (a) Visualizer Answer (b) Verbalizer Answer

Based on figure 4, visualizer subjects Vs1 and Vs2 can answer question number 3 with different strategies. It indicates flexibility in students' abilities. Although the strategy is the same, namely using trigonometric identities. The choice of the technique employed was to form trigonometric identities in Pythagorean identities to produce a value of 1. Then they solve it correctly.

R : You succeed in answering more than one strategy. How did you finish the problem?

Vs1 : Because I've done things like that before miss, and I think there is more way to answer.

Vs2 : I answered it by changing the trigonometric identity. For the first step, I change $\tan^2 A$ to $\sin^2 A / \cos^2 A$ and the second step I change $1 + \cos^2 A$ to $\operatorname{cosec}^2 A$

In addition, the verbalizer students, Vb1 and Vb2, only can answer with one strategy and are incomplete. Moreover, Vb1 and Vb2 do not solve the problem in other strategies due to forgetting the material. This problem was very often among students.

R : You were only able to answer in one strategy. How did you finish the problem?

Vb1 : I forgot how I answered the question.

Vb2 : I just know $\sin^2 \alpha (1 + \cot \alpha) = 1$ and I forget what others.

R : Was the problem have another strategy? If there was, what is it?

Vb1 : I don't know.

Vb2 : I don't know miss.

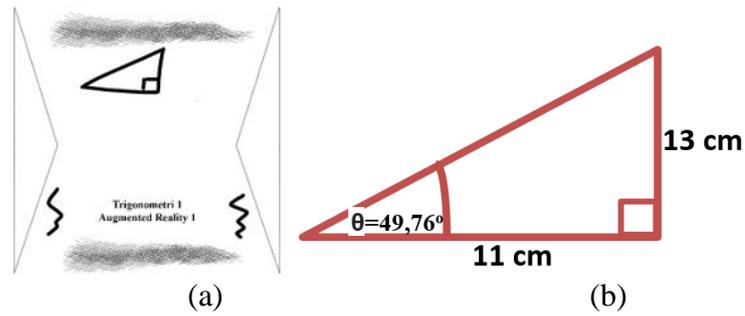


Figure 5. (a) Barcode augmented reality (b) Augmented reality

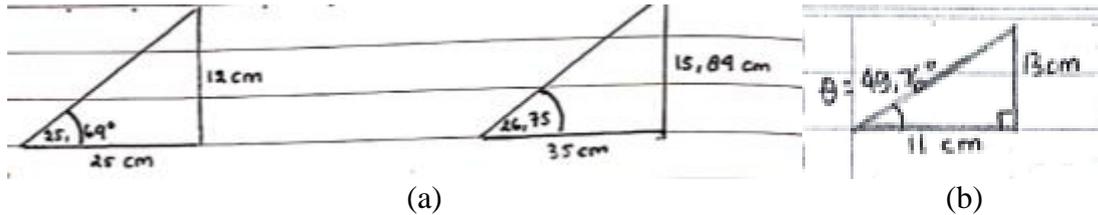


Figure 6. (a) Visualizer answer (b) Verbalizer answer

In this case, question number 4 on figure 5 using augmented reality application. And the answers based on figure 6, visualizer subjects Vs1 and Vs2 can write what they know and are asked. Vs1 and Vs2 can give more than one answer.

R : You succeed in answering more than one. How did you finish the problem?

Vs1 : I use the help of a calculator miss, and this question is easier with a picture.

Vs2 : I also use the help of a calculator at first miss, and when I understand the problem, I answer it that way, with a triangle like that.

However, the verbalizer students, Vb1 can only write down the example of the question without trying to answer, and Vb2 did not answer the question.

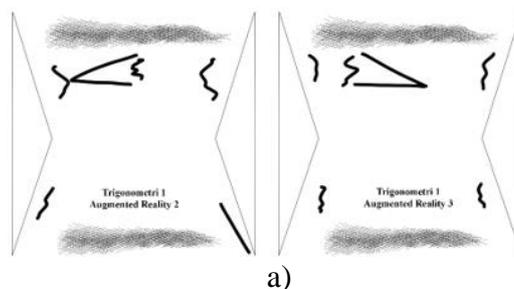
R : Do you understand question number 4?

Vb1 : I don't think so.

Vb2 : It seems hard.

Originality

In the originality indicator, figure 7 is the result of the answers from the visualizer and verbalizer students at number five. In contrast, figure 10 shows the answers from the visualizer and verbalizer students at number six. Meanwhile, figure 7 shows the augmented reality for number 5, and figure 8 shows the augmented reality for number 6.



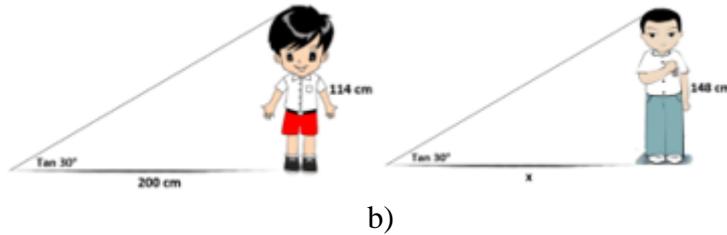


Figure 7. (a) Barcode augmented reality (b) Augmented reality

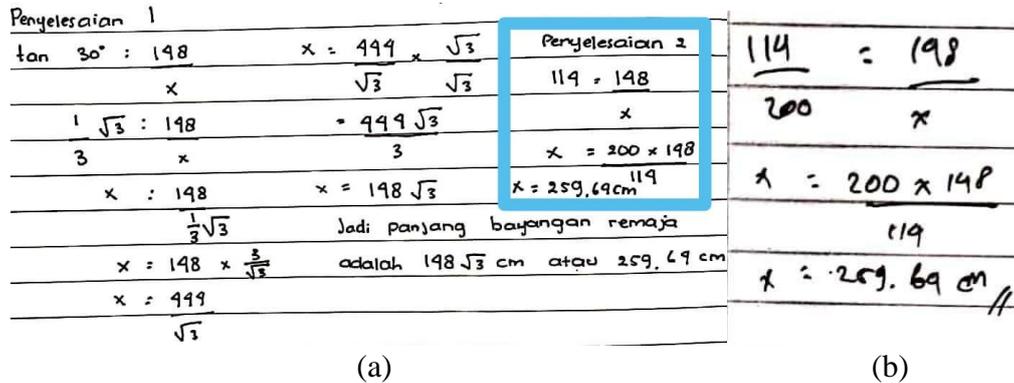


Figure 8. (a) Visualizer Answer (b) Verbalizer Answer

Figure 7 shows the augmented reality for this question, and based on figure 8, the visualizer students' Vs1 and Vs2 can answer question number 5 correctly. Vs1 and Vs2 could be finding an original solution with two solutions, calculation process, and correct results. At first, they used trigonometric, and then they used mathematical comparison.

R : Can you explain how you got the results?

Vs1 : Number 5, I answer using $\tan 30^\circ$ miss to get the shadow length. And I draw a picture to solve the problem because it's unclear if I do not draw a picture.

Vs2 : I answer it in two-way miss. For the first step, I answered directly according to the formula miss with $\tan 30^\circ$ to find x . And the second step, I used to compare the child and teenager pictures to find the shadow length. And I have to draw an illustration to answer this number.

For the verbalizer answer, Vb1 can answer the question briefly using mathematical comparison, and Vb2 did not answer the question.

R : Do you understand question number 5?

Vb1 : I think yeah, I don't know if it's true or not. But I'm comparing the child and the teenager to find the shadow length.

Vb2 : No, I don't understand miss.

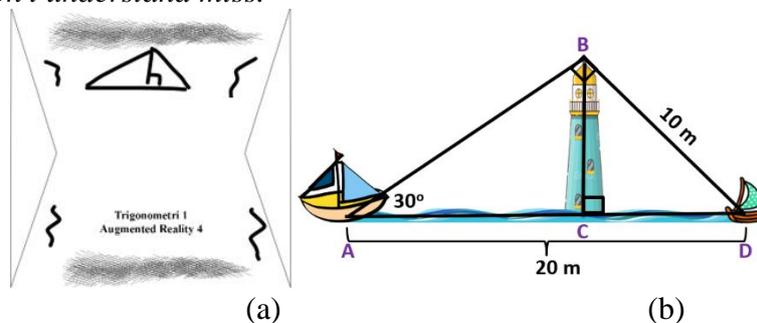


Figure 9. (a) Barcode augmented reality (b) Augmented reality

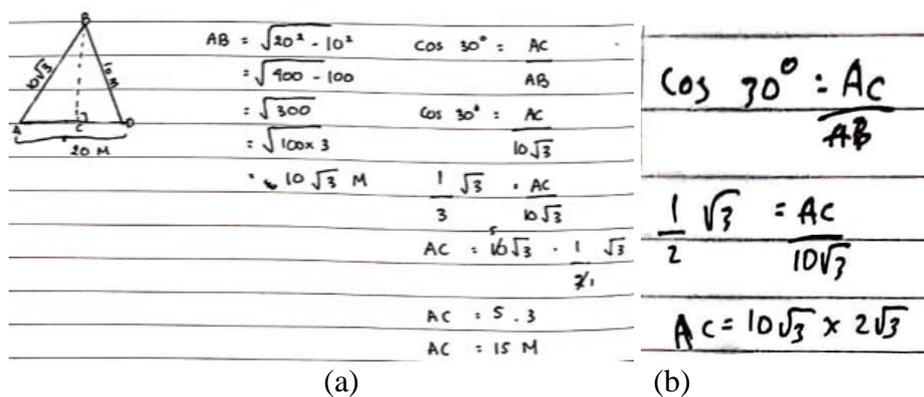


Figure 10. (a) Visualizer answer (b) Verbalizer answer

Figure 9 shows the augmented reality for this question, and based on figure 10, the visualizer students' Vs1 and Vs2 can answer question number 6 with the original solution, calculation process, and correct results. The visualizer student has used a mathematical comparison to solve this problem.

R : Can you explain how you got the results?

Vs1 : First, I am looking for the length AB, then I'm using the formula $\cos 30^\circ$ to find AC.

Vs2 : In the question asked, the length AC miss, and ABD triangle is a right triangle. First, we were looking for the length AB with Pythagoras. After we find the length of AB, we can use the formula with $\cos 30^\circ$ to find AC.

For the verbalizer students, Vb1 can answer the question but is incomplete, and Vb2 did not answer the question. Based on the interviews, the verbalizer students had difficulty answering.

R : Can you explain how you got the results?

Vb1 : I don't know miss.

Elaboration

In the elaboration indicator, figure 11 results from the answers from the visualizer and verbalizer students at number seven. In contrast, figure 11 results from the answers from the visualizer and verbalizer students at number eight.

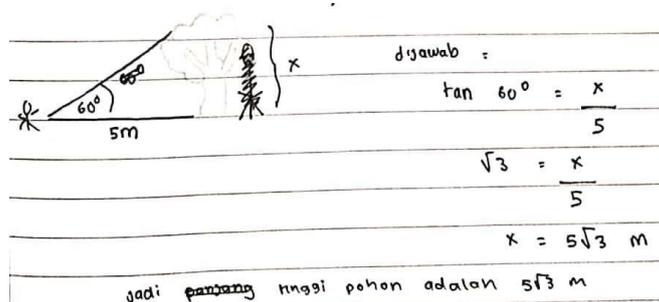


Figure 11. Visualizer answer

Based on the figure 11 results of the visualizer student's answer for question number 7, subjects Vs1 and Vs2 can solve the problem in detail. The visualizer students drew an illustration to explain more and made conclusions completely and clearly.

R : Can you explain how you got the results?

Vs1 : First, I was asked to find the tree's height, so I drew an illustration first, and I assume the height of the tree as Y . And then just enter the formula $\tan \alpha$ or $\tan 60^\circ$.

Vs2 : Number seven directly uses the \tan formula. Because it is known the side and asked the front side. So I use the formula $\tan 60^\circ$.

In addition, the verbalizer students, both Vb1 and Vb2 did not answer the question.

R : Why you did not answer the question?

Vb1 : I don't understand.

Vb2 : I don't understand.

$\sin 45^\circ = \frac{t}{50}$
 $t = 50 \cdot \sin 45^\circ$
 $t = 50 \cdot \frac{\sqrt{2}}{2}$
 $t = 25 \sqrt{2}$
 Jadi, tinggi tiang sesungguhnya $25\sqrt{2}$ M

Figure 12. Visualizer answer

Based on the figure 12 results of the visualizer student's answer for question number 8, subjects Vs1 and Vs2 can solve the problem correctly. The students also give an illustration to make a triangle to explain the answer and write the conclusion at the end of the answer.

R : Can you explain how you got the results?

Vs1 : In the problem, 45° is known, the question is height, and the side is known. After that I assume height as T , then enter the formula into $\sin 45^\circ$.

Vs2 : For number eight, I use the formula \sin . Because \sin is the front side per hypotenuse, and what is known as the hypotenuse, therefore I use the formula $\sin 45^\circ$ to determine the height of the pole.

In addition, the verbalizer students, both Vb1 and Vb2 did not answer the question.

R : Why you did not answer the question?

Vb1 : I don't understand. I don't have enough time.

Vb2 : I don't understand.

In this case, the verbalizer students need more time to think up the solutions. There is no preparation and not enough time to take the test. This also indicates that verbalizer students have not been able to determine the answer to the question on elaboration indicators.

Discussion

Based on the study's results, there is a difference between the cognitive style of visualizer and verbalizer students' creative thinking ability assisted with augmented reality.

Fluency

In the fluency stage, the most prominent characteristic is that students can provide more than one relevant idea with a correct and clear solution. This result aligns with previous research

(Siswono, 2011) that students show fluency when they produce different ideas. Visualizer students', Vs1 and Vs2, can answer with many ideas for numbers one and two. Also, verbalizer students', Vb1 and Vb2, can solve the problem with more than one solution in numbers one and two. Visualizer and verbalizer students' have a similar concept, but the way they use the quadrant in trigonometric is different.

Both visualizer students' and verbalizer students' managed to meet the fluency indicator. Therefore, it is known that both students easily to be able to solve the problem. It is in line with the previous research by (Firdaus et al., 2018) with his research that the fluency indicator is the highest.

Flexibility

In the stage of flexibility, the aspect seen is to provide answers in more than one way with the correct process and calculation. It is in line with the previous research (Fatmawati, 2016) that flexibility creates new ideas. Visualizer students', Vs1 and Vs2 know what is asked and determine different strategies for developing existing problems. Also, in this staged interview, visualizer students' admit that they are easier with pictures. It follows the characteristics of the visualizer, which is more interested in images. Meanwhile, verbalizer students', Vb1 and Vb2 cannot answer due to forgetting the material. It is in line with previous research (Faradillah & Humaira, 2021) that forgetting the material is one of several factors for student errors in solving problems.

It is known that visualizer students' can meet the flexibility indicator while verbalizer students' do not meet this indicator. In this stage, verbalizer students' have difficulty. In line with previous research, students have difficulty determining flexible indicators (Siswono, 2011).

Originality

In the originality stage, originality's characteristics are not only being able to provide good solutions but also being able to provide good and innovative solutions. Originality includes thinking of ways to express unique or unusual statements (Lince, 2016). Visualizer students', Vs1 and Vs2, found original solutions using mathematical comparison. Moreover, verbalizer students', Vb1 can answer briefly while the Vb2 did not answer. The visualizer students' draw an illustration to solve the problem in this stage, which indicates that the visualizer is more image-oriented.

It is known that visualizer students' Vs1 and Vs2 can meet the originality indicator while verbalizer students' only Vb1 can meet this indicator. However, Vb2 seems to have difficulty. It is this stage. It is in line with previous research (Puspitasari et al., 2019) that students with low mathematics ability have difficulty determining understanding problems.

Elaboration

The elaboration stage can be said to have an elaboration indicator if it can add details to the main idea (Doerr, 1980). Students not only give short answers but are also able to give the right reasons in the form of good explanations so that other people who read will more easily understand the students' answers given. Visualizer students', Vs1 and Vs2 can solve the problem in this stage in detail and give a sketch to explain more. It is represented elaboration that has to explain in detail or answer specific mathematical situations (Lince, 2016). On verbalizer students', Vb1 and Vb2 did not answer the question due to limited time.

It is known that visualizer students' can meet the elaboration indicator while verbalizer students' do not meet this indicator. The difficulty is visible on this indicator for verbalizer students'. There is no preparation and not enough time to take the test. It also indicates that verbalizer students have not been able to determine the answer to the question on elaboration indicators.

Visualizer and verbalizer cognitive styles have differences in learning. Students with a visualizer cognitive style tend to be more proficient in images. Therefore, verbalizer students dominate in words. In using augmented reality technology, there is an effect on learning. It is in line with a study by (Acesta & Nurmaylany, 2018) that there is an effect of using augmented reality media on learning outcomes. It means that indirectly interest in learning mathematics increases. However, there are obstacles for researchers, such as the use of technology which is relatively new for students. Based on the description above, learning using augmented reality positively impacts students' creative thinking ability in mathematics. However, there are differences between the cognitive styles of visualizers and verbalizers.

Conclusion

The creative thinking ability assisted with augmented reality has a different result in visualizer-verbalizer cognitive style. The researchers found that visualizer students dominate all indicators of creative thinking compared to verbalizer students'. Students with a visualizer cognitive style can meet all the indicators of fluency, flexibility, originality, and elaboration. They took a step in carefully with strategies and various ways and did not have any difficulties understanding the problems. However, the verbalizer students' only meet fluency indicators or fluency and originality indicators in creative thinking ability. Their ideas were less in ways and strategies also making steps toward the solution, but they still encountered many obstacles. The flexibility and elaboration indicator of creative thinking has not yet emerged in the students' verbalizer cognitive style.

Therefore, teachers can pay more attention to the student's cognitive style in creative thinking ability. This study has several limitations of the study, with this limitation expected to be improved in future research. This research only uses three variables: creative thinking ability, augmented reality, and visualizer-verbalizer cognitive style. Whereas many other variables in

students' thinking ability and cognitive style. Also, collecting data in this study is time-consuming due to the development and validation of augmented reality technology.

Conflicts of Interest

The authors declare that no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely by the authors.

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