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Students' Creativity in Suspension Bridge Miniature Projects Based on Field-Dependent Cognitive Style

Nova Febrian Alfianita[1*], Yurizka Melia Sari[1]

[1]Pendidikan Matematika, Universitas Negeri Surabaya, Kota Surabaya, Indonesia

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***Corresponding author:**
novafebrian.22026@mhs.unesa.ac.id

Abstract: Creativity is the ability to generate new ideas that are needed in the world of work, which demands innovation and solutions to complex problems. In the context of education, students still find it difficult to develop their creativity because learning is still carried out in a conventional manner. This research is a qualitative study that aims to describe the creativity of high school students in designing miniature suspension bridges using a STEM approach to quadratic functions, as viewed from a field-dependent cognitive style. The data for this study was collected from twenty-eight high school students at a school in Malang City. The research data was collected through the group embedded figures test, mathematics ability test, miniature suspension bridge products, and interviews. The research subjects were two students with a field-dependent cognitive style. The results of the study indicate that cognitive style influences how students model quadratic functions in a miniature suspension bridge project, and that students with a field-dependent cognitive style do not utilize quadratic functions when constructing the suspension arches. Therefore, further research is recommended to strengthen the integration of mathematical concepts in STEM projects.

INTRODUCTION

Conventional mathematics learning, such as teacher-centered learning, can hinder the development of students' creativity (Mesnan et al., 2023). In fact, individuals with high creativity can help in the workplace to identify problems and develop new ideas (Javed et al., 2021). Conventional mathematics teaching methods can make it difficult for students to apply concepts because they only focus on memorizing formulas, preventing them from developing their creativity (Shodikin & Rohim, 2020). In mathematics education, quadratic functions are one of the topics that students find difficult to understand due to their limited ability to explore the shape of the graph visually (Orhani, 2023). Therefore, an innovative approach is needed that challenges students to relate quadratic functions to real life (Utami et al., 2025). This issue has prompted to need for in-depth research on student creativity in quadratic function material.

To explore this issue further, this study examines student creativity through three indicators of CPAM developed by Besemer (1998), namely novelty, resolution, and elaboration and synthesis. These three indicators are used to assess students' creative products in making miniature suspension bridge using the STEM approach in quadratic function material. Creativity is not limited to finding new ideas but also combining ideas into something different from before (Nugraha et al., 2023). However, even if the idea differs from the previous one, it must still meet certain specifications and criteria in line with the design objectives (Aguilera & Ortiz-Revilla, 2021). Therefore, this study also examines how students process information, particularly in terms of field dependent cognitive styles. Individuals with field dependent cognitive style tend to be passive, only doing what they are asked to do and often relying on others to process information, so they often miss important details (Mahvelati, 2020). Therefore, creativity and cognitive style need to be studied further.

Previous studies have shown that STEM projects can encourage creativity. Cahyono et al. (2025) shows that AI-based STEM tasks can facilitate the creativity of pre-service teachers through the design of mathematical dances. Setio & Utama (2022) shows that collaborative projects based on mathematical abilities in STEM with 4DFrame can encourage creativity. Altan & Tan (2021) emphasizes that design-based STEM can enable creativity to emerge. Meanwhile, Azizah et al. (2020) also carried out projects by creating STEM-based creative products to enhance creativity.

Based on previous research, it appears that there are still no studies linking student creativity with field dependent cognitive styles in the context of STEM projects using quadratic function. In fact, cognitive styles can provide insight into student characteristics (Chen & Hwang, 2022). Since previous studies have not yet discussed creativity in STEM projects based on field dependent cognitive styles, this study aims to fill that gap. Therefore, this study aims to fill the gap in previous research by assessing creativity based on STEM project products created collaboratively according to cognitive styles. Cognitive style was chosen as the basis for collaboration because it makes it easier to identify factors that influence ideas during collaboration (Lwande et al., 2021).

In line with previous research gaps, this article focuses on the creativity of high school students in STEM projects by designing miniature suspension bridges using quadratic functions from a field dependent cognitive style perspective. The aim is to describe the creativity of high school students with a field dependent cognitive style in designing miniature suspensions bridges using a collaborative STEM approach to quadratic functions. Therefore, research is needed on the creativity of high schools' students with field dependent cognitive styles in collaboratively designing miniature suspension bridges. This research is expected to be the best solution for educators to provide information on developing tasks with STEM content that encourages creativity, especially in quadratic function material.

METHOD

This study is a qualitative study that aims to describe the creativity of high school students in STEM projects by making miniature suspension bridges using quadratic functions as viewed form field dependent cognitive style collaboratively. This study uses a qualitative approach with a case study method, which aims to analyze a case in greater depth (Creswell, 2009).

The data source for this study involved 28 eleventh-grade students from a public high school in Malang City in the 2025/2026 academic year. Of the 28 students, there were 7 students with field dependent cognitive style. The researcher selected 2 students as research subjects because these two students had equivalent mathematical abilities and collaboration could also be carried out with minimum of two people (Wahyudi, 2024). These two subjects were selected based on their Group Embedded Figures Test scores from Witkin et al. (1977) to determinate their cognitive styles and equivalent mathematical ability test scores.

The research instruments used in this study included the Group Embedded Figures Test (GEFT) adopted from Witkin et al. (1977), a mathematics ability test, creativity indicators adapted from the Creative Product Analysis Matrix (CPAM) developed by Besemer (1998), STEM project sheets, and interview guidelines. The following are the data analysis techniques used in this study.

Group Embedded Figures Test Analysis

A total of 28 students were given the Group Embedded Figures Test (GEFT), which consisted of three sessions, including a practice session in the first session and test sessions in the second and third sessions. Students completed the GEFT by finding simple shapes within complex shapes. Each correct answer was given a score of one, while incorrect answers were given a score of zero. The scores were then added up to determinate cognitive style.

Mathematics Test Ability Analysis

In this study, students were also given a mathematics ability test consisting of five essay questions related to quadratic functions. The mathematics ability test in this study was used to find subjects with equivalent mathematical abilities. Equivalent mathematical abilities in this study adopted those of Putri & Masriyah (2022), who stated that mathematical abilities are equivalent if the difference in scores is less than or equal to five on a scale of 0 to 100.

STEM Project Product Analysis

Student creativity data is based on the products they designed during the research process. Student creativity is an assessed according to the indicators listed in Table 1.

Table 1. CPAM Creativity Indicator by Besemer and Treffinger (1981)

Indicator	Sub-Indicator	Description	Indicator Core	
			Individual	Group
Novelty	Original	Sketches and miniatures of suspension bridges demonstrate the originality of the idea.	NOV1-I	NOV1-K
	Surprise	The suspension arches are different from those on the STEM project sheet.	NOV2-I	NOV2-K
Resolution	Valuable	The miniature suspension bridge was created using aspects of STEM.	-	RES1-K
	Logical	The suspension arches resemble parabolas in quadratic functions.	RES2-I	RES2-K
	Useful	The suspension arches are connected to distribute the load.	RES3-I	RES3-K
	Understandable	The group can explain the miniature suspension bridge they have made.	-	RES4-K

Indicator	Sub-Indicator	Description	Indicator Core	
			Individual	Group
Elaboration and Synthesis	Organic	Each element of the suspension bridge can be connected to each other.	ESY1-I	ESY1-K
	Elegant	Students can make use of the materials provided. Evan though they are limited.	-	ESY2-K
	Well crafted	The sketches and miniatures of the suspension bridge are neat and accurate.	ESY3-I	ESY3-K

Interview Results Analysis

The interviews conducted in this study aimed to gather additional information related to students' creativity in the miniature suspension bridge project. Detailed interview guidelines can be seen in Table 2

Table 2. Interview Guidelines

Number	Question	Indicator
1.	How did you come up with the idea for the sketch of miniature suspension bridge?	Novelty
2.	Why did you choose to make the arch with the same direction/number/pattern as the suspension bridge in the STEM project sheet example?	
3.	How did you implement STEM aspects in the miniature suspension bridge you made?	Resolution
4.	How did you ensure that the shape of the suspension arch was truly parabolic?	
5.	What is the relationship between the parabolic shape of the suspension curve and how the bridge bears weight?	
6.	How does this suspension bridge work when bearing weight?	
7.	Do all parts of the bridge support the function of the bridge, or are some parts merely decorative?	Elaboration and Synthesis
8.	What was your strategy for making a miniature suspension bridge with limited materials?	
9.	How did you divide the process so that the results were neater?	

RESULT AND DISCUSSION

Result

Data from GEFT and Mathematics Ability Test

GEFT aims to determinate students' cognitive styles. Of the total 28 students who took the GEFT, 7 students had a field dependent cognitive style. Based on the GEFT results, 2 students with equivalent mathematical ability test were selected as research subjects. Details of the selected research subjects can be seen in Table 3.

Table 3. Data from Research Subjects

Student Name	Student Code	GEFT Score	Cognitive Style Category	Score of Mathematics Ability Test
FBA	FD1	8	*Field Dependent*	68
AMZ	FD2	11	*Field Dependent*	72

Data from STEM Project Product and Interview

Both research subjects were given STEM project sheets that needed to be completed individually. After that, the research subjects were divided into one group and then worked on the group STEM project sheet. In the group STEM project sheet, there was an instruction to make a miniature suspension bridge. After the product was completed, the researcher interviewed both research subjects to obtain more in-depth information related to creativity. The following is an analysis of the product results, divided into individual and group analysis.

Individual

On the novelty indicator, both members of the FD group were able to sketch a suspension bridge by showing original ideas but without any surprising element. The ideas expressed in the suspension bridge sketches were obtained from exploration several sources, such as the internet and YouTube. This was discovered by the researcher during interviews. When each member was asked about the ideas for the suspension bridge sketches, subject FD1 said "I saw on YouTube how to make it strong, and I figured out how to make the pylon myself." (NOV1-I). FD2 also said, "Look on the internet, find inspiration from the internet, then I see what the real bridge looks like." (NOV1-I). although the idea came from an external source, both individuals modified the bridge design, particularly the suspension arch, which was adjusted to a quadratic function. The choice of a suspension arch design that utilizes a quadratic function arose from the understanding of each individual.

Both members of the FD group presented sketches of suspension bridges with suspension arch resembling the suspension bridges provided the researcher on their individual STEM project sheets. The suspension arch forms an upward-facing curve and can be represented in a quadratic function with a positive coefficient a $(a > 0)$. The sketch drawn on FD1's STEM project sheet can be seen in Figure 1.

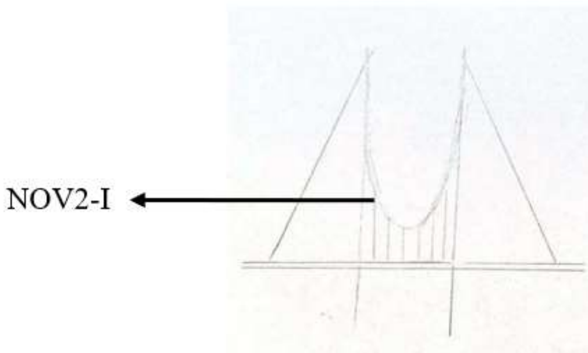

Figure 1. Sketch of FD1 Suspension Bridge

From Figure 1, the suspension bridge sketch made by FD1 shows a similar suspension arch shape to that on the individual STEM project sheet. FD1 said, "My plan was to make a typical suspension bridge." (NOV2-I). This shows that FD1 intended to follow the suspension arch pattern on the STEM project sheet without trying to explore other shapes. The shape of FD2's suspension bridge is also the same FD1's, as can be seen in Figure 2.

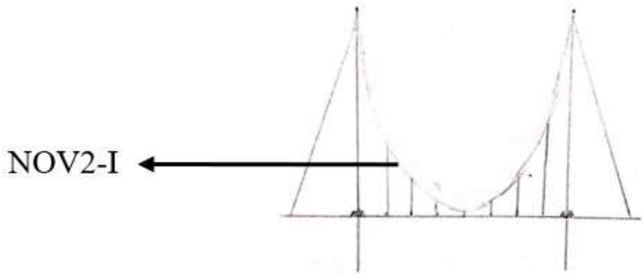

Figure 2. Sketch of FD2 Suspension Bridge

The sketch of the suspension bridge owned by FD2 also has suspension arches tha are similar in shape to those in the individual STEM project sheets. FD2 explained the reason behind the choice of sketch shape, "Because bridges generally require a sketching process before construction. So before building, they must test it first so that after everything is ready for use according to the requirements, the bridge can finally be built. That's why I chose a suspension bridge in general because its safety is definitely clear." (NOV2-I). This shows that FD2 is confident that $a > 0$ is the safest suspension arch shape.

From the sketches and interview results, it appears that the bridge sketches of both individuals did not imitate each other's designs, thus fulfilling the originality sub-indicator. However, the surprise sub-indicator was not fulfilled because the suspension arches in the sketches still resembled those provided in the STEM project sheet.

Both individuals can create symmetrical suspension arches that resemble the parabolic shape of a quadratic function. The sketch of FD1's suspension bridge in Figure 1 is consistent with the shape of $f(x) = 0{,}5x^2 - 7x + 50$. FD1 confirmed this consistency during the interview, saying, "Yes, I used x y, ma'am. I made it and then deleted the coordinates and estimated a little, ma'am.". Meanwhile, the sketch of FD2's suspension bridge in Figure 2 is consistent with the shape of $f(x) = x^2 - 4x + 9$. FD2 conveyed this consistency during the interview, "I copied from GeoGebra, ma'am.".

Both FD individuals were unable to utilize the concept of quadratic functions to explain the relationship between the suspension arch and the load distribution of suspension bridges. This was discovered by researchers in the completed individual STEM project sheets and based on interview results. The following is FD1's answer regarding the selection of the suspension arch shape.

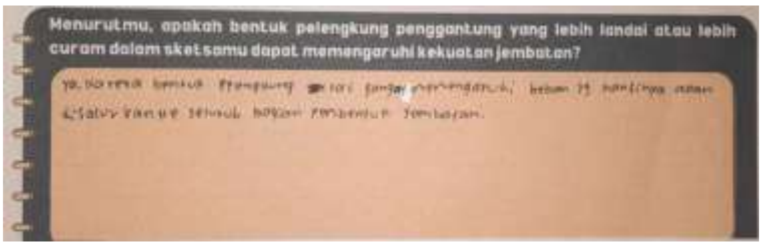

Figure 3. FD1 Response for Useful Sub-Indicator

FD1 Answers:
Yes, because the shape of the curved rope greatly affects the load that will later be distributed to all parts of the bridge structure. (RES3-I)

FD1 also added the reason for choosing the curved suspension shape during the interview, “Okay, yesterday I planned to make it a little deeper, ma’am. Then for the load distribution, the rope is connected to the road and the sides of the pylon, ma’am. So that’s what causes the load to be distributed evenly.” (RES3-I). FD1 did not associate the chosen quadratic function, $f(x) = 0{,}5x^2 - 7x + 50$, with the load distribution of the suspension bridge. This was also similar to FD2, as can be seen in Figure 4.

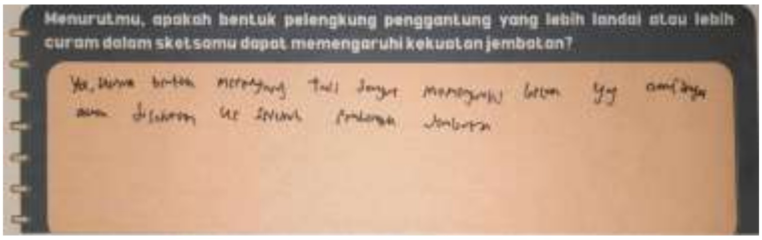

Figure 4. FD2 Response for Useful Sub-Indicator

FD2 Answers:
Yes, because the curved shape of the cable greatly affects the load that will be distributed across the entire surface of the bridge. (RES3-I)

FD2 also added the reason for choosing the curved arch shape during the interview, “In my opinion, at first, I thought that if the bridge was long and the pylon was tall, it would be balanced. Then the cable is just right, not too deep and not too high. I think that’s it.” (RES3-I). FD2 did not associate the chosen quadratic function, $f(x) = x^2 - 4x + 9$, with the load distribution of the suspension bridge.

From the results of the sketches, STEM project sheets, and interviews, it can be concluded that both individuals with a field dependent cognitive style can fulfill the logical sub-indicator because they are able to make a suspension arch resembling a quadratic parabola. Although it is in accordance with a parabola, neither of them has connected the quadratic function used with the load distribution, so the useful sub-indicator is not fulfilled. These findings indicate that both individuals only utilized the shape of the suspension bridge with a quadratic function visually and did not relate it to the structure of a suspension bridge.

FD1 and FD2 were able to sketch suspension bridges with complete parts such as suspension rods, suspension arches, and bridge decks. This can be seen in the suspension bridge sketches made by each individual in Figures 1 and 2. Both FD group members said that they ensured the completeness of the bridge parts through interviews. FD1 said, “What convinced me was that I really consideres all the parts when I made it. Starting with the ropes first, then the pylon, and the path.” (ESY1-I). FD2 also stated, “What convinced me was that parabola in GeoGebra and the shape I wants to create. So, I thought about how the structure would be and how to make it sturdy. So, I didn’t make it carelessly.” (ESY1-I).

The sketches of suspension bridges made by each individual also showed neatness. Both individuals said that there were no revisions made during the sketching process. FD1 said, “No, ma’am. I drew the ropes first.”, while FD2 also confirmed, “No.”. The interview results showed that the sketches remained neat even though they did not go through a process of repeated revisions.

From the sketches and interviews, it can be concluded that both field dependent cognitive style individuals can meet the organic sub-indicator because they are able to sketch a suspension bridge with each part connected to one another and also demonstrate neatness.

Group

The idea for the miniature suspension bridge belonging to the FD group came from an idea belonging to a member of the group itself. In collaborative work, both group members showed each other the designs they had created during their individual work. The FD group chose to use FD1's design as the group's main design, as explained by FD1 during the interview, "There was no consideration for AMZ to follow me. So, it doesn't really affect the bridge." (NOV1-K). In terms of individual contributions, FD1 was the main contributor of design ideas, while FD2 tended to just follow along. Here, FD1 tried to change the values of parameters a, b, dan c. This modification shows that the overall idea came from FD1's own construction and that FD2 simply accepted the idea without reanalyzing it.

The FD group displayed a miniature suspension bridge, which can be seen is Figure 5.

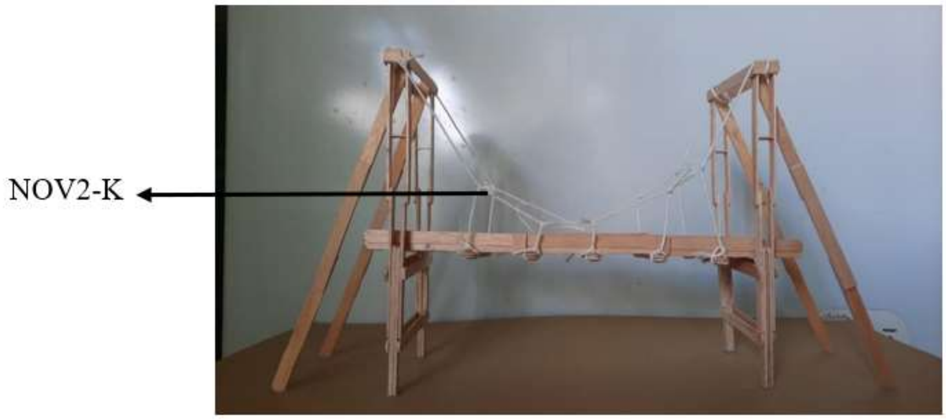

Figure 5. FD Group Suspension Bridge Miniature

The FD group did not show any different patterns in the suspension arches compared to the suspension bridges in the STEM project sheet. This is also consistent with the suspension bridge sketches made by each member of the FD group, where no other patterns were used. This group chose a suspension bridge with a quadratic parabola characteristic, namely value of $a > 0$. FD1 explained the reason behind choosing this suspension bridge, "Because it was our first time making a suspension bridge and we didn't have any experience in making bridges. So, we made a standard one first, and later, if we were given more time, we might have made a more unique one." (NOV2-K). The tendency to maintain the pattern used in the suspension arch shows that the FD group did not attempt to come up with ideas that where different from the examples given.

Based on interview results, the FD group has fulfilled the original sub-indicator because the idea of a miniature suspension bridge came from the group itself, but it did not fulfill the surprise sub-indicator because the suspension arch pattern was still the same as the example on the STEM project sheet. This shows that the FD group could not fulfill the novelty indicator and was categorized as stable because there was no improvement or decline compared to the previous individual ideas.

The FD group utilized STEM aspects in creating miniature suspension bridges. This was conveyed by FD1 during the interview, "In terms of science, this bridge can bear weight, because the weight is in the middle and can be distributed. So, perhaps the pylons can help bear the weight, the cables can help bear the weight, and the road can also help bear the weight, so the science is distributed. Then, in terms of technology, perhaps I can make these cables in GeoGebra to help with the idea of how the cables should be and what their values should be. In terms of engineering, we looked at the shapes and how we could make a bridge from strong sticks, perhaps by gluing them together or making them a little thicker. In terms of mathematics, we used GeoGebra to create $ax^2 + bx + c$ for the cables, then length of the bridge, and the height of the pylon." (RES1-K). Group FD applied STEM through the selection of the shape of the suspension arch so that it could distribute the load given to the bridge (science), the use of GeoGebra to help find the appropriate quadratic function equation (technology), the creation of miniature suspension bridge using ice cream sticks so that the shape would be strong (engineering), and the determination of the length of the bridge, height of the suspension rods, and the use of quadratic function for suspension arches (mathematics). FD1 added, "We really took the STEM aspects into account, ma'am.".

Based on the product, the arch curve made by the FD group still does not resemble the parabolic curve of a quadratic function because its shape is still somewhat jagged. The product can be seen in Figure 5. In their individual work, each member of the FD group had a similar arch curve, namely a steep arch curve. After collaborative work, the FD group agreed to continue using the steep arch curve shape in the sketches they made. However, the products they made did not reflect the designs they had made on group's STEM project sheet. This was conveyed by FD1 during the interview, "I thought that the height of the pylon would be sufficient to make it quite deep, but when it was applied, it didn't really go very deep.". The discrepancy may have occurred because the group did not utilize the quadratic function used, $f(x) = 1{,}5x^2 - 2x + 5$in the product realization.

In individual work, each member of the FD group had not yet linked the quadratic function relationship in the suspension arch with the load distribution. After collaborative work, the FD group's miniature suspension bridge displayed a suspension arch that was correctly used to distribute the load form the bridge deck to the suspension's rods. Unfortunately, the FD group was not yet able to show the quadratic function relationship used in the suspension arch with the load distribution. This was discovered by researchers during interviews, "It seems like there is a connection, but I'm a little confused about which one is stronger, the one that curves inward or the one that is flat. Yes, maybe we can see it from the value. For example, the greater the value of a, the more it curves inward, so it might be a little stronger to withstand the entire load." (RES3-K). This shows that the FD group does not yet understand that differences in the shape of suspension arches can affect the load distribution of suspension bridges. As a result, the suspension arches are merely curved without any mathematical basis behind them in terms of load distribution.

When sked to explain how suspension bridges work to support loads, the FD group responded, "Yes, first I want to explain that in terms of the rope, it has a quadratic function. How about the strength of materials, ma'am. If the materials are thin, it is not very strong. It can bear some weight, but not very heavy." (RES4-K). The FD group explained the miniature suspension bridge that was made briefly without elaborating on the relationship between quadratic functions and load distribution on the suspension arches.

Based on the product and interview results, the FD group has fulfilled the valuable sub-indicator because they can relate the product they made to STEM. The logical sub-indicator is not fulfilled because the shape of the suspension arch, they made does not resemble the parabola curve of a quadratic function, unlike the individual work. The FD group also did not meet the useful sub-indicator because they could not relate the shape of the suspension arch to the load distribution. In terms of understandable, they also did not meet the sub-indicator because the explanation provided did not relate the quadratic function used to the load distribution. This shows that the FD group did not meet the resolution indicator and was categorized as declining because there were different sub-indicators and showed errors compared to the individual work.

The miniature suspension bridge made by the FD group has one part that does not contribute to the strength of suspension bridge. This was stated by FD1 when asked about the elements of the suspension bridge that could be removed, "This one, ma'am (the suspension rod support). Because it doesn't really affect anything, if it's just this, it's fine, but I think it's not strong enough." (ESY1-K). the suspension bridge support does not affect the structure of the bridge, and even when the support is removed, the bridge is still strong enough to bear the load. This shows that not all parts of the miniature suspension bridge play a role in distributing the load.

In this study, the basic materials used to make miniature suspension bridges were limited to ice cream sticks. Group FD demonstrated the maximum utilization of the materials provided. This was discovered by the researcher when asking questions related to the strategy used in making suspension bridges, "Yes, there is. If there are only 1 or 2 sticks, it is not strong enough, so we make it a bit thicker. I stack 4 to 5 pieces and then apply them. It is indeed strong, because if there is only one stick to support the load, it will definitely be bad, so, it must be doubled to make it strong." (ESY2-K). Based on the interview results, this group tried to maximize the materials provided by the researchers. This shows that the group was able to design a miniature suspension bridge solution with simple materials without using excessive materials.

The miniature suspension bridge made by the FD group shows good quality and neatness. This is also supported by the group's explanation of the steps involved in making the product, "First, we made the right and left sides, doubled them with sticks so that the sticks here are held in place by the edges. Then, under the bridge, we stack more sticks to make it stronger in the middle so it can bear heavy loads. Then we make a strong pylon so it doesn't move with the bridge when bearing loads, whether it's going up or down. Then we just add the ropes if they are too loose. So how can we make the ropes strong, straight, and not loose." (ESY3-K). Based on the explanation and the final product, the miniature suspension bridge is neat, strong, and not damaged when a load is applied.

Based on the product and interview results, the FD group did not meet the organic sub-indicator because there was one part that only served as decoration and did not affect the strength of the bridge when removed. The elegant sub-indicator is met because they were able to utilize the materials provided to make a strong suspension bridge. The well-crafted sub-indicator is also met because the miniature suspension bridge shows neatness and precision. This shows that the FD group still does not meet elaboration and synthesis indicators and is categorized as declining because there are different sub-indicators and shows errors compared to when working individually.

Discussion

The findings of the study described above provide an overview of the characteristics of collaborative creativity among students with a field dependent cognitive style. One important finding is the tendency of field dependent groups to rely on the ideas of one member of the group. In field dependent groups, the ideas used in making miniature suspension bridges came entirely from one group member, while the other group members simply followed along without any consideration. This finding is line with the research by Takdirmin dan Mahmud (2023a) that students with a field dependent cognitive style tend to rely on external contexts. The external context referred to is the group's dependence in the ideas of one group member. FD1 became the external context for FD2, so FD2 did not try to develop its own ideas and tended to rely on FD1's ideas. Although this may fulfill the original sub-indicator, the dependence of ideas on one member of the group may prevent the surprise sub-indicator from being fulfilled because there is no attempt to develop the idea further.

The next finding was the uncertainty of field dependent cognitive style students in making decisions. This was evident when the group was unsure about the most suitable shape of the suspension arch to support the load, even though they realized that the quadratic function could actually affect the shape and strength of the suspension bridge was loaded. Indecision in decision-making is indeed a characteristic of the field dependent cognitive style, which is caused by this cognitive style being overly influenced by elements in its environment (Rifa'i, 2021). Additionally, study Deviani & Masduki (2025) also noted that the field dependent cognitive style is unable to articulate ideas to solve the given problem, which could also be one reason why this cognitive style remains uncertain when making decisions. These findings are also in line with the research by Hardiansyah et al. (2024), which states that field dependent cognitive style tend to be hasty and indecisive in solving problems. The uncertainty of the field dependent group in determining the shape of the suspension bridge arch affected the weakness of the resolution indicator. This uncertainty indicated that the quadratic function was not used as a basis for selecting the shape of suspension bridge arch, so the logical and useful sub-indicators were not fulfilled. This can happen because individuals with a field dependent cognitive style tend to rely on external factors, causing them to feel uncertain about their own decisions (Takdirmin & Mahmud, 2023b).

Another finding is that the field dependent cognitive style group only mentioned the suspension arch using quadratic functions without using it as a basis for manufacturing. This shows that quadratic functions are not used as a tool for modeling, but merely as a concept that is mentioned. As a result, the shape of the suspension arch did not resemble the quadratic function parabola curve and did not match the design made on the group's STEM project sheet. This mismatch between the shape of the suspension arch and the requested command was found in Hardiansyah (2024) study, namely when students with a field dependent cognitive style gave incorrect answers when given problems. This finding is in line with research by Jazim et al. (2021), which found that the field dependent cognitive style is able to utilize all available information even though its implementation is not yet fully optimal. The field dependent group utilized various information, ranging from miniature suspension bridge examples, GeoGebra, and ideas from group members. However, the information possessed was not utilized optimally when making the miniature suspension bridge product. It turns out that this was previously explain in Sholahuddin et al. (2021) research, which indicated that students with a field-dependent cognitive style indeed require scaffolding to complete assigned tasks so they can be more focused. Based on the results, while the mention of quadratic functions could fulfill the valuable sub-indicator, the logical and useful sub indicators were not fulfilled.

CONCLUSION AND SUGGESTION

The creativity of field dependent cognitive style students in making mianiture suspension bridges appeared in several sub-indicators of creativity. In general, field dependent cognitive style students can produce original ideas, but the quadratic function concept was not optimally utilized in product creation. The quadratic function was only mentioned as a concept used, but its relationship with load distribution was not analyzed further. Group creativity tends to depend on one member, indecision in making decisions, and failure to relate quadratic functions to load distributions. This causes sub-indicator of creativity to not be fulfilled, such as surprise, logical, and useful. Threfore, reseahers who will conduct similar research can emphasize to students to use mathematical concepts as a basis for decision making.

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