Geographical Creative Thinking Ability (GCTA) of Students in the Diamond Panning Cempaka Area Banjarbaru

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Abstract **– This research aims to identify students' geographical creative thinking ability (GCTA) and analyze teachers' problems in developing GCTA for high school students in the diamond panning area, Banjarbaru City, South Kalimantan. This research method is a quantitative method using survey techniques and a qualitative method using interview techniques. The research sample consisted of 234 students and 11 geography teachers. The results of the research show that most of the GCTA in the diamond panning area of Banjarbaru City have a fairly creative predicate of 39.7% and a less creative predicate of 35.5%. Another finding was that high school GCTAs in city centers far from diamond panning had higher GCTAs in terms of fluency, flexibility and elaboration. However, in terms of originality, suburban students near the panning area had better results. Most teachers have implemented the development of students' GCTA, but have encountered challenges and obstacles. The findings in this research can provide input to schools, teachers in particular, and related institutions to provide the best solutions in the form of new policies, such as making a curriculum that is relevant to the needs of students and teachers in terms of developing creativity.**

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1. Introduction

In the 21st century, students need to have the 4C abilities, namely critical thinking, collaboration, communication, and creative thinking [1], [2]. In line with Albar *et al*. [3] and Yeh Y *et al.* [4] stated that students in the 21st century must have the skills to face all market challenges in the future. In this research, one of the 4C abilities studied is creativity, especially the ability to think creatively in solving geographical problems or geographical creative thinking ability (GCTA). One of the interesting topics to study in geography learning is the problem of managing natural resources in Indonesia for which students will later look for solutions in the form of high-level questions, namely high order thinking skill (HOTS). HOTS is the ability to analyze, synthesize, evaluate, improve abilities, estimate, generalize and create thoughts, make decisions, set critical and systematic goals in thinking [5], [6], [7], [8].

Creativity is the result of the thoughts of someone who has the ability to think creatively [9]. Creativity is needed by current and future generations [10], [11]. The ability to think creatively is very important to instill in students in facing future challenges, as stated by Yildiz, C *et al.* [12] that the ability to think creatively should be instilled from an early age. This is because with creativity a person is able to create new, unique products with different ideas [13], [14], [15]. Creativity allows us to fly to the moon, create works of art, develop computers, and cure various diseases [16]. Quality education can be measured by students' ability to produce original ideas, have broad insight, and not just based on academic achievement [3].

The ability to think creatively has an important role in geography learning, such as asking and answering questions, along with active learning and practical investigations.

In geography there is a spatial approach so that in solving problems there is an attachment to place or location [17]. Geography with its environmental approach can be applied to learning so that students can solve problems in their environment with different and unique solutions so that creative ideas are formed [18], [19]. The creative thinking abilities of high school students in the revised version of Bloom's taxonomy can be grouped into stages C4-C6, namely analyzing, evaluating, and creating so that they can be categorized into high-level or creative thinking [20].

One of the challenges in studying geography is the lack of a clear definition of geography creativity itself. This creativity needs to be explored and developed more seriously by focusing on students' responses when solving a problem with different thought processes and with many ways to overcome this through various indicators [21]. To uncover these challenges, this can be done by applying indicators of creative thinking ability with clear boundaries based on experts or previous researchers, including fluency, flexibility, originality and elaboration [22], [23], [24], [25].

The facts show that students' creative thinking abilities in Indonesia are relatively low and there are many obstacles in making it happen. There are still many students who have not solved complex problems, are only able to solve simple problems, and tend to follow example procedures [26], [27]. The Global Creativity Index survey in 2015 showed that Indonesia was ranked 115th out of 139 countries [28]. Apart from that, the results of other institutional surveys by the Program for International Student Assessment (PISA) show that students' creative thinking abilities in Indonesia are ranked 72nd out of 78 countries [29]. A survey conducted on 4000 teachers in the United States, Germany, Australia, and England stated that there are many obstacles in developing creativity. These obstacles are an education system that depends on the results of assessments and exams, lack of resources, teachers are prohibited from deviating from the applicable curriculum, teachers do not yet have the techniques and tools to develop creativity [30], [31].

Geography, in relation to science, has an important position and function for human life. Geography knowledge allows humans to know about the state of nature and the various kinds of changes that occur as well as the impact of human actions on nature itself [32]. Geography learning with an environmental approach can be used to measure students' creative thinking abilities such as environmental topics or those around them. The environment at school is a good source of learning, especially in studying problems related to geographic phenomena.

Students are expected to get the right solutions with sensitivity and in-depth analysis and high-level thinking to overcome these problems. Studying local issues and designing solutions to local problems makes students grow as active participants and contributors to local community problems so that they become sensitive to the environment and develop creative thinking [33], [18], [34].

Teachers are the main learning source for students during learning which can foster student creativity. Teachers who are creative during teaching will create creative students [35]. This research states that the implementation of teaching and learning scenarios that foster creativity can be created by the teacher's actions. Based on observations and discussions with geography teachers in Banjarbaru City, teachers already have the awareness to emphasize creative thinking in teaching. However, the challenges and obstacles they face make them prioritize other aspects, such as conceptual understanding only [36].

There are many factors that can encourage the growth of student creativity, but many teachers have not done so. Mellou [37] states that things that influence the development of creativity are a creative environment, teachers with creative teaching methods, and creative programs. Teachers in geography learning generally do not provide enough opportunities for students to look for divergent answers. Classroom teaching tends to focus on developing analytical thinking with routine and rote problems. Many secondary school teachers report a lack of updates regarding how to create geography questions that require higher order thinking skills. So far, teachers have considered the ability to think creatively as an ability that can be sought by themselves [38]. Teachers have not found the right way to develop these abilities because students' time and knowledge are also limited [39].

In Banjarbaru City there is a Cempaka Diamond panning and it is one of the community mines in Indonesia which is also unique in this research. Diamond panning is certainly no stranger to the community, especially high school students in the city of Banjarbaru. The activities carried out by Cempaka residents in terms of mining include mining for stone, sand, diamonds and gold, but more mining results are found in the form of diamonds. Previously, diamond panning was only done with simple tools, but over time the panning has changed to using machine technology. The use of this machine technology causes a lot of environmental damage [40]. These environmental problems would be very appropriate to be used as material to test students' GCTA so that they can then find solutions to solve the problems. Students are expected to be able to find creative ideas because of problems that students have often heard and seen.

Apart from that, this research will also explore what obstacles and barriers teachers face in developing and growing students' creative thinking abilities in Banjarbaru City.

Based on the background above, this research aims to identify the geographical creative thinking abilities (GCTA) of high school students in the Cempaka diamond panning area, Banjarbaru City and analyze teachers' problems in developing students' GCTA in Banjarbaru City, South Kalimantan. It is hoped that the results of this research will provide an overview of the differences in student creativity in suburban and urban areas, as well as provide an overview of the problems faced by teachers in developing student creativity in the Cempaka diamond panning area. For this reason, the best solutions and follow-up actions are needed to develop students' creativity appropriately in learning geography.

2. Literature Review

This literature study examines the concept of creative thinking (CT), geographical creative thinking ability (GCTA), and how to develop creative thinking abilities which are the basis for this research.

2.1. Creative Thinking (CT)

Someone who has CT will use their thinking to create various new ideas and thoughts, think flexibly, differently, originally, think twice, be curious, easily become suspicious, and produce different solutions [41]. CT will create ideas, descriptions, concepts, a series of diverse new experiences and knowledge [42]. CT apart from generating and constructing an idea, it can also foster motivation in competing so that it can produce human resources that can compete in the future [43], [44], [45], [46]. CT in this research is also defined as the ability to create strong new ideas, new ways of dealing with problems that arise from discussions and interactions with friends [47].

Creative thinking ability is the ability or thought process to provide new ideas that can be applied in solving problems [23], [48], [49]. Guilford [50] divides creativity into eight constructs: flexibility, fluency, novelty, analysis, reorganization, redefinition, synthesis, complexity, and elaboration. Then other experts such as Trefingger and Torrance [15], [24] stated that the CT indicators consist of fluency, flexibility, originality, and elaboration, the same as research conducted by Munandar [23] and Islami *et al.* [22] using these indicators to classify students' creative thinking abilities.

Research on geography learning encourages CT exploration to develop a deep understanding of geography concepts. Geography subjects have a wide range of content and are quite challenging to understand and use [51]. Geography with its spatial and environmental approach can stimulate students' creativity, namely learning from the problems of the surrounding environment [52]. Geography learning focuses a lot on memorization alone, even though CT is needed for more divergent thinking. To teach CT in geography learning is difficult and requires combining CT in specially designed assessment materials. CT learning supports teachers and increases the possibility of student engagement [53].

2.2. Geographical Creative Thinking Ability (GCTA)

GCTA is a CT in geography required to develop students' abilities. Unusual thought processes in studying various problems will focus students' attention and responses in solving these problems by determining outcome criteria through CT indicators, namely, fluency, flexibility, originality, and elaboration [15]. GCTA is a student creative thinking ability that is developed in geography learning. Student creativity built in geography learning provides opportunities for all students to develop their creative capacities. These opportunities are a means for young people from a variety of contexts to engage with the complexity of geographical ideas [54]. Problem solving can be one approach to understanding students GCTA. Social issues and contextual environmental problems are potential topics for developing students' creative thinking abilities [16]. GCTA deals with divergent and convergent thinking; problem discovery; problem solving; observing new relationships; and making associations between techniques, ideas, and application areas [56].

Many studies state that mastery in geography learning at school is closely related to students' CT [56], [52], [57], [55], [19]. As a result, Torrance [24] in his research stated that fluency and flexibility are important, namely having diverse ideas or opinions on various things. Trefingger [15], Munandar [23], Islami *et al.* [22] also said that originality and elaboration in answers makes students have new and different ideas from before with more detailed stages. In this way, students with different abilities and backgrounds will have the ability to answer problems according to their abilities by emphasizing four aspects, namely fluency, flexibility, originality, and elaboration which can later be applied in real life.

From the explanation above, it can be concluded that GCTA is characterized by creating something new from results, ideas, descriptions, concepts, experiences and knowledge related to geography which includes fluency, flexibility, originality, and elaboration. One area of study related to cognitive processes is CT [58]. CT makes students think divergently, namely being able to produce varied answers to a problem and is very good for development [59]. With creativity in the future it can encourage innovation, increase productivity, flexibility and the ability to adapt to circumstances [60], [61].

2.3. How to Develop and Foster Student Creativity

Teachers as educators have a responsibility to foster student creativity. Teachers need to know possible ways to foster this creativity. Teachers' teaching behavior plays an important role in developing creativity [31]. Supporting factors for increasing creativity according to Mellou's research [37] are a creative environment, teachers with creative teaching methods and creative programs. Teachers are the main learning source for students during learning and become models for them to emulate. When teachers behave creatively it is likely that students will imitate them [62]. Atkin [63] also states that this will happen if the social environment is supportive, namely schools and classes where interactions between students and teachers occur. Scenarios for implementing classroom learning that can foster creativity require creative actions from the teacher [35].

To foster students' creative thinking abilities in the classroom, Barrow [64] states by encouraging students to ask more questions, investigate cause and effect, observe problems. Cropley [65] and Soh [31] stated that teachers who foster student creativity are by: encouraging students to learn independently, having a cooperative teaching style, motivating students to master factual knowledge, students have a solid foundation and be able to think divergently, assess students ideas thoroughly and create clear assessment indicators, encourage flexible thinking in students, respond to students' questions seriously, provide opportunities and offer students to learn in different conditions, and help students overcome feelings of frustration and failure.

According to Jackson *et al.* [66] indicators that can foster creativity are: giving students permission to be creative, encouraging them and appreciating their efforts to be creative, providing space to try new things, giving them the confidence to taking risks and confidence in facing unexpected situations, providing real world learning and meaningful activities for students, providing fun and challenging learning situations, teachers as guides and facilitators, there is a questioning approach in learning, creating opportunities with problem-based or inquiry learning approaches, providing opportunities for collaborative work and discussion, and being responsive to students as a group and as individuals and adapting their teaching to emerging new possibilities.

Based on the explanation above, it can be studied and concluded that the indicators for developing and growing students' creative thinking abilities in this research are: the use of contemporary and current learning models whose scenarios are very suitable for developing creativity such as PjBL, PBL and the like which include problem-based learning and collaborative with groups, use of environment-based learning resources so that learning situations become real and meaningful, mastery of ICT by teachers and up-to-date learning resources so that student motivation increases and student literacy references become wider, providing questions with problem-solving nuances and investigations with clear assessment indicators, so that students think more divergently, often direct students to conduct discussions and ask questions, and give students freedom to be creative and provide reinforcement when they act creatively.

3. Methodology

The research method used in this research is a quantitative descriptive method using survey techniques and a descriptive qualitative method using interview techniques. This research was carried out for 3 months from August to November 2023. Research data was obtained from questionnaires that had been validated by experts, and analysis of high order thinking skill (HOTS) questions that had been tested for reliability and validity.

The subjects of this research were all 11 Senior High School geography teachers in Banjarbaru City. As well as all state high school students in the diamond panning area in Banjarbaru City who have received material on natural resource management. This material has been given to class 12 IPS, totalling 597 students from 5 schools. Sample determination uses the Krejcie and Morgan formula with 95% confidence [67]. The formula used is:

$$\frac{X^2 N.P\ (1-P)}{e^2(N-1)+X^2.P(1-P)} \quad 3\text{-}1)$$

Where:

X^2 = 3.841
N = Number of Population
e = 0.05
P = 0.5

The sampling technique in the research used proportional random sampling technique by lottery. The number of samples per school is presented in Table 1.

Table 1. Population and research sample

School	Population (Student)	Sample (Student)	Class
Senior High School 1	134	53	XII IPS 1 and 3
Senior High School 2	105	41	XII IPS 1 and 2
Senior High School 3	162	63	XII IPS 3 and 4
Senior High School 4	130	51	XII IPS 2 and 3
Senior High School 5	66	26	XII IPS 2 and 4
Amount	**597**	**234**	**10**

The question instruments for GCTA testing have previously been tested for validity and reliability so that they are suitable for use. This test was carried out with the SPSS 26.0 for Windows program using Cronbach alpha and bivariate person. The prerequisite for the validity test is a Sig value. (2 tailed) <0.05 and the pearson correlation is positive, then the questionnaire items are valid. With a Cronbach alpha reliability test prerequisite value of >0.60, the questions are declared reliable or consistent.

GCTA measurement indicators according to Islami *et al.* [22], Munandar [23], Trefingger [15] consist of fluency, flexibility, originality, and elaboration. The GCTA measurement results were analyzed using descriptive quantitative methods based on the resulting numbers and tables. They are then grouped based on a Likert scale consisting of students who are very creative to those who are not creative. The questions consist of 4 questions which contain environmental problems in the form of environmental damage caused by community mining, namely Cempaka diamond panning in Banjarbaru City. Other questions are about the Meratus forest, fuel oil, and water scarcity. The traditional diamond panning in Cempaka, Banjarbaru City can be seen in Figure 4.

Figure 1. (a). Researchers at the mining site; (b). The traditional diamond panning process carried out by the community

Figure 1 above shows the traditional diamond panning process carried out by the local community. This mining is popular in South Kalimantan, especially in Banjarbaru which is located in Cempaka District. This mining is classified as a type of small-scale mining because it is a community mine [68]. Problems arising from this panning activity can be identified by students along with the solutions that must be implemented and can bring out their creativity in thinking.

Another instrument in this research was a questionnaire distributed to 234 students and 11 teachers containing yes or no answers. This is done to find out whether the teacher develops GCTA during learning. The questionnaire uses GCTA development indicators according to Cropley [65], Jackson *et al.* [66], and Soh [31].

This research was also analyzed qualitatively to determine the obstacles and challenges in developing creativity. This is done in an interview with open questions. The questions presented in the interview are as follows:

Question 1: What obstacles and challenges do teachers face when using contemporary learning models during lessons?

Question 2: What obstacles and challenges do teachers face when using ICT and up-to-date learning resources in the learning process?

Question 3: What obstacles and challenges do teachers face when using environment-based learning resources?

Question 4: What obstacles and challenges do teachers face when giving questions that involve problem solving and inquiry in learning?

Question 5: What obstacles and challenges do teachers face in directing students to conduct discussions and ask questions during learning?

Question 6: What obstacles and challenges face teachers when giving students the freedom to be creative and strengthen their learning?

The data analysis technique used in this research is to describe, research, and explain what is being studied as it is. Then draw conclusions from the phenomena that can be observed using data presented in the form of numbers in tables and graphs based on predetermined indicators [69]. Apart from that, the data was also analyzed by data reduction, data presentation, and drawing conclusions [70].

4. Results

The results of students' GCTA measurements in the diamond panning area in the city of Banjarbaru, South Kalimantan and the problems that occurred in the development of the GCTA are as follows:

4.1. GCTA (Geographical Creative Thinking Ability) of Students in the Diamond Panning Area of Banjarbaru City

The results of the GCTA measurements of students in Banjarbaru City which were carried out at 5 State Senior High Schools were grouped and presented in Table 2 and graphs in Figure 2.

Table 2. GCTA grouping of students in the Cempaka Banjarbaru diamond panning area

Predicate	Amount (student)	Percentage (%)
Very creative	4	1.7
Creative	34	14.5
Quite creative	93	39.7
Less creative	83	35.5
Not creative	20	8.5
Amount	**234**	**100**

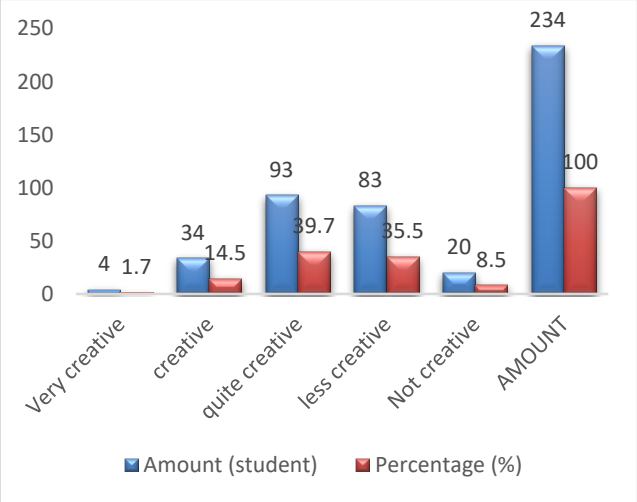

Figure 2. Graph of GCTA grouping of senior high school students in the diamond panning area

Based on Table 2 and Figure 2 above, it shows that the GCTA measurement results of 234 students were only 4 people or 1.7% who were classified as very creative. Then there were only 34 students with a creative predicate or 14.5%. The number of students with creative predicate was quite high, namely 93 people or 39.7%. There were 83 less creative students with a percentage of 35.5% and 20 students with a non-creative predicate or 8.5%. These results indicate that students' creative thinking abilities in geography learning need to be developed. This can be seen from the measurement results on 234 students with the largest percentage being moderately creative and less creative. GCTA of 5 high schools in the diamond panning area, Banjarbaru City can be seen in Table 3 and Figure 2.

Table 3. Comparison of the GCTA percentage of senior high school students in the Cempaka Banjarbaru diamond panning area

Predicate	Senior High School 1 (%)	Senior High School 2 (%)	Senior High School 3 (%)	Senior High School 4 (%)	Senior High School 5 (%)
Not creative	0	0	0	8.5	36.4
Less creative	23.4	21.3	51.1	53.2	36.4
Quite creative	55.3	34.0	44.7	27.7	27.3
Creative	14.9	44.7	2.1	10.6	0.0
Very creative	6.4	0.0	2.1	0.0	0.0
Amount	100	100	100	100	100

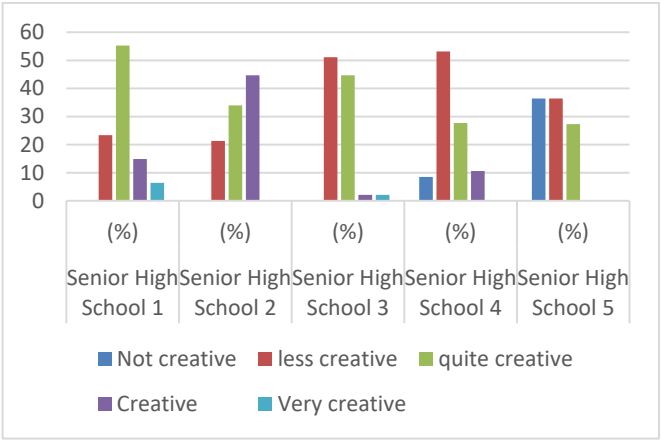

Figure 3. Comparison graph of GCTA for senior high school students in Banjarbaru

Based on Table 3 and Figure 3 above, the GCTA results with the title of very creative are at Senior High School 1 Banjarbaru which is located in the city center. with a very creative percentage of 6.4%. The predicate of students who are not creative is dominated by students at Senior High School 5 Banjarbaru, while students who are less creative dominate, namely Senior High School 3 Banjarbaru at 51.3% and Senior High School 4 Banjarbaru at 53.2%. Then the highest number of creative students was at Senior High School 1 Banjarbaru at 55.3%. The students with the highest creative predicate at Senior High School 2 Banjarbaru were 44.7%. The research results show that the creative thinking abilities of high school students in Banjarbaru City are low and need to be developed. The findings in this research are that at Senior High School 1 and Senior High School 2, which are located in the city center, the GCTA is higher than the GCTA of high schools on the outskirts of the city, namely Senior High School 3, Senior High School 4, and Senior High School 5.

However, in terms of originality, students from Senior High School 3 Banjarbaru, which is located close to the panning location had better answers than students from other schools.

The authentic evidence of student answers is presented in Figure 4 and 5:

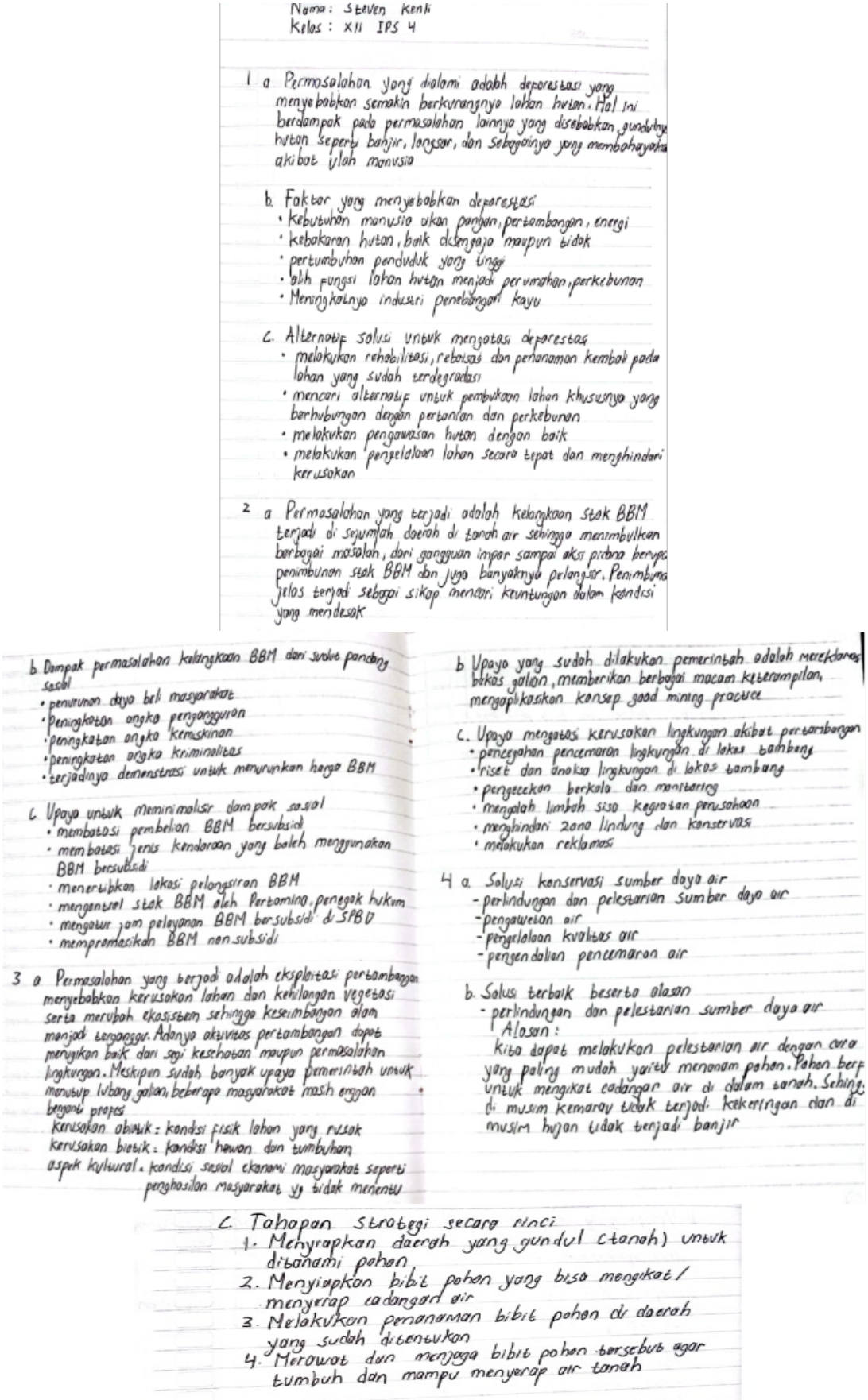

Figure 4. Example of student answers with the predicate Very creative

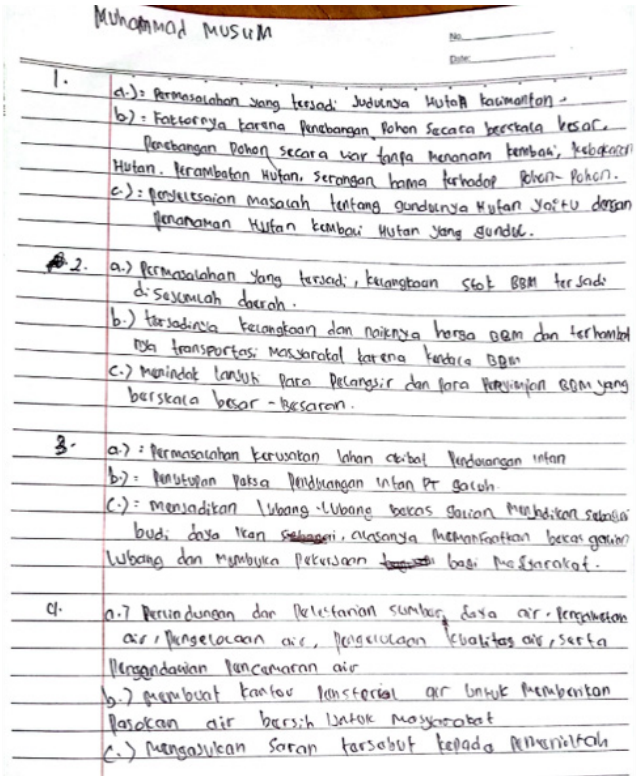

Figure 5. Example of student answers with less creative predicate but better originality

Based on the image above, it can be analyzed in terms of fluency, flexibility, and elaboration in image 4, the answer results are higher than in image 5. This shows that the student in Fig. 4 has used deep and divergent thinking in problem solving. Meanwhile, Fig. 5 fluency, flexibility, and elaboration of students' answers is still lacking but it is better in terms of originality, namely students can answer with new ideas that are unique and different.

4.2. Problems of Developing GCTA for Students in the Cempaka Diamond Panning Area, Banjarbaru City

The development of GCTA for students in the Cempaka diamond panning area, Banjarbaru City based on teacher and student answers is presented in Table 3. This indicator is based on Cropley [65], Jackson *et al.* [66], and Soh [31]. Apart from that, the results of interviews with 11 Geography teachers (R1-R11) were also analyzed regarding the obstacles and challenges in developing GCTA, namely as follows:

Table 3. Percentage of students' GCTA development based on answers from 11 Geography teachers and 234 high school students in the diamond panning area of Banjarbaru city

Question	Teacher's Answer (N=11)	N	%	Student Answers (N=234)	N	%
Has the teacher used contemporary learning models during lessons?	Yes No	11 0	100 0	Yes No	234 0	100 0
Has the teacher used ICT and up-to-date learning resources in the learning process?	Yes No	11 0	100 0	Yes No	234 0	100 0
Does the teacher often give questions that involve problem solving and investigation during learning?	Yes No	9 2	81.8 18.2	Yes No	202 32	86.2 13.8
Does the teacher often direct students to conduct discussions and ask questions during learning?	Yes No	11 0	100 0	Yes No	234 0	100 0
Does the teacher give students freedom to be creative and empowered during learning?	Yes No	11 0	100 0	Yes No	180 54	76.9 23.1
Has the teacher used environment-based learning resources?	Yes No	2 9	18.2 81.8	Yes No	126 108	53.8 46.2

Based on Table 3, it can be seen that the use of contemporary learning models shows that 11 teachers and 234 students answered that they had done this, namely 100%. The obstacles faced by teachers in implementing it according to R1 are that students' basic abilities are still lacking. Then R7 stated that the obstacles came from students, namely intake, literacy and students' lack of learning experience. R8 and R10 added that the obstacle was the lack of supporting facilities in implementing the new learning model. Apart from that, R4, R6 and R11 also think that implementing learning models such as PJBL, PBL, and the like requires a long time and the students' abilities are different.

The use of information and communication technology (ICT) in learning data shows that 100% of teachers and students answered that at school they already use ICT. Teachers' challenge and obstacles in applying ICT during learning according to R1, R2, R9, and R11 are inadequate supporting infrastructure. R3 stated that the application had not been mastered and needed to be studied again. Then R4, R7, and R8 added that children do not yet have devices such as laptops and cellphones, the child quota is not sufficient, and the school Wi-Fi signal is very weak.

Giving questions that have the nuance of problem solving, the teacher's answer data stated that 81.8% had done it. Then the student answer data showed that 86.2% of teachers gave questions with a problem-solving nuance. Teachers' obstacles in making these questions according to R1 are due to the different abilities of children. R2 states that the students' mindset still has difficulty in studying questions. R4 and R5 stated that creating these questions required thinking and was quite difficult. R6 and R8 added that students' literacy was still lacking, making them difficult to answer questions with nuanced investigations. Then R8 also stated that the obstacle was the difficulty in determining indicators and assessment scales.

The existence of discussions and questions and answers in class from research data shows that 100% of teachers and students answered that at school they had used this method. This method is usually used in conjunction with contemporary learning models in the classroom. Teachers' constraints and obstacles in implementing it during learning according to R1, R2, R8, R10 and R11, that students who have more abilities tend to be the support of their friends, while other students are passive. Then R3 says that only certain classes can apply the method. R6 and R10 added that students' literacy was lacking so they were unable to express their opinions.

In terms of giving students the freedom to be creative and think divergently, the teacher's answer data shows 100% achievement.

In contrast to the student answer data, only 76.9% of teachers did this. The obstacle to its implementation that can be analyzed according to R1 and R3 is that many students still experience difficulties in developing their thoughts and ideas so they always depend on the teacher. This shows that teachers still use conventional teacher-centered learning models.

The use of environment-based learning resources data from teachers' answers shows that 81.2% have not done this. Then, from student answer data, only 53.8% of teachers have used environment-based learning. Most teachers do not go directly to the field but only bring environmental problems into the classroom with the help of image and video media. Teachers' constraints and barriers to implementation according to R1, R2 and R6 are limited in time. R3, R7 added that funding and supervision of students requires careful planning. Meanwhile, R10 and R11 stated that sometimes permission from the school was difficult to take students outside.

5. Discussion

The findings in this research indicate that the majority of GCTA students are moderate and less creative. Many students have not been able to develop answers to the questions given by the teacher, most of them do not have the flexibility, fluency, originality, and detail in answering HOTS questions. The lack of GCTA is caused by, among other things, the teacher's lack of action in encouraging students to be creative. Student creativity can be fostered if teachers as educators focus on seeking and building a learning environment that emphasizes creativity [71]. Teachers as facilitators for students should provide treatment that can develop students' creative thinking abilities in terms of problem solving. Teachers can create relevant learning tools and instruments [73], [74]. The use of appropriate learning resources can make learning more interesting and meaningful and new ideas for solving problems can be generated [18], [16]. Creativity is very important so teachers in schools should continue to actively build student creativity [74], [75].

For this reason, teachers in Banjarbaru City, especially geography teachers, need to be given knowledge, professional competence, and motivation. The hope to be achieved is to have high awareness in fostering student creativity. Encouragement and motivation from teachers in cultivating and developing creativity is very important and necessary for students. Yuan *et al.* [76] stated that student creativity is influenced by teacher encouragement and their intrinsic motivation.

In line with Conradty and Bogner [77], teachers need to be given training with appropriate simulations in order to develop their professionalism in teaching. Further research can be carried out on developing teacher motivation in learning.

The lack of GCTA is also caused by schools as places of learning and programs such as the government's curriculum not being supported. Mellou [37] that a creative school environment and programs are very helpful in terms of developing creativity. Mawardhiyah and Manoy [78] and Fatmawati [79] also stated that students' poor thinking abilities due to learning at school do not lead to increased creativity, they tend to only memorize and remember one answer.

Most of the development of GCTA has been carried out by teachers, but the indicators that have been carried out have experienced many challenges and obstacles. This has been explained in the research results. Students' lack of literacy is the biggest obstacle that teachers complain about. Eshun and Agyeman [80] in their research showed that students' low creativity was found in the literacy aspect. In line with Cai and Gut, [81] in their research explains that someone with low literacy causes a lack of problem solving. For this reason, it is necessary to strengthen student literacy in Banjarbaru City with the support of government and school programs. This is done by including literacy as a mandatory habit in the curriculum.

Teachers cannot apply the stages and syntax of contemporary learning models completely due to limited time and different students' knowledge. As stated by Ika *et al.* [82], the disadvantages of using contemporary learning models such as PjBL are that they require a lot of time, students become less active and less motivated. In fact, PjBL is useful for developing student literacy because in the process there is searching for information for problem solving [83]. Another advantageous thing is the achievement of the material to be conveyed and combining it with technology so that students do not just study at school. Carrying out learning at home by providing online learning resources has the advantage that limited time is no longer an obstacle.

The use of ICT in schools is important to increase student motivation and help teachers deepen literacy. Another important thing is the attainment of the material during learning. The quality of learning is currently determined by the integration of technology, information, and communication [84], [85], [86]. The existence of ICT can increase motivation and enthusiasm for learning [87], [88], students can participate in the learning process continuously, and their interest increases [89].

Society's dependence on digital media is important for teachers to face these challenges by making learning more meaningful and able to overcome problems [90]. Schools in Banjarbaru City should provide internet facilities to the classrooms. The thing that teachers must pay attention to is that to prepare themselves in this technological era, they must have ICT skills.

Making questions that have a nuance of problem solving and investigation in the form of HOTS (high order thinking skills) questions makes students think divergently. HOTS type questions can familiarize students with thinking broadly, solving problems so that creativity grows [91], [92], [93], [59], [73], [74]. Giving questions that direct students to answer with their thoughts gives them freedom to be creative. This triggers students to be able to think divergently which produces diverse ideas in answering a problem [66]. When creating questions, teachers should adjust to the indicators and create an appropriate assessment scale by looking at various previous references.

Several studies show that one way of successful learning is discussion, question, and answer. Discussions, questions, and answers help students become active and think more creatively [94], [95], [96]. Conventional learning that teachers often use, such as the lecture method, does not maximize student involvement and interest in learning [97], [98]. A learning model that is centered on students and adapts to their needs is very necessary.

Teachers give students freedom to be creative and strengthening students during learning can help students become flexible, enthusiastic about learning, and help the formation of new, creative ideas. Jackson *et al.* [66] stated that encouraging students to be creative becomes a stimulus and provides energy for them to take further action. Student-centred learning is very good and the teacher only acts as a facilitator so that students' creations can be formed. Apart from that, students are also given reinforcement from the teacher so they can control their behavior, such as praise if they behave creatively [100]. Winston and Baker [101] also stated that increasing creativity is strongly influenced by reinforcement. Apart from that, according to Wijayanto et al [102] that reinforcement creates learning motivation and can increase creativity. Student-centered learning is very well carried out and the teacher only acts as a facilitator so that student creations can be formed [103], [104], [72], [99]. Soh [31] also said that creative behavior is rarely reinforced and escapes the teacher's view compared to ordinary convergent thinking. This reinforcement should occur at the right time so that the student behavior we want can be realized.

The next finding from this research is that the GCTA of students in the city center is higher in terms of fluency, flexibility, and elaboration. This happens because the culture and learning environment in the city center area is more supportive compared to the outskirts. Apart from that, there is enrichment by teachers, encouragement from parents at home and also a more prominent learning atmosphere. This can improve creative thinking abilities, as stated by [31] that creative schools and the ecology of creative places will influence student behavior. Schools in city centers also have better Internet connection in classrooms, making it easier to use ICT.

Another finding is that the originality of students who live near the diamond panning area, namely Senior High School 3 Banjarbaru, is better than other schools. This is because students are used to seeing the phenomenon of traditional mining activities. Apart from that, some of their parents were also miners there. Their answer is uniquely different from other schools, such as the question regarding the solution offered to reduce environmental damage due to diamond panning. They answered by making a fish pond in the rectangular panning area. Based on researchers' observations, fish can still live in the former mining pond. Apart from making fish ponds, they also want to create a cultural tourism geo park and approach land owners to carry out reclamation with agro-plants. It can be concluded as stated by [18] that environment-based learning is very appropriate to be applied to help students recognize problems and find better solutions. This is in line with the results of this research, only 18.2% of teachers did this. Apart from that, it is combined with ICT and contemporary learning models whose stages and syntax support the growth of creativity.

6. Conclusion

This research produces an analysis of the geographical creative thinking ability (GCTA) of students in the diamond panning area of Banjarbaru City which is still lacking. Apart from that, differences were also identified in the creative thinking abilities of high school students in city centers far from diamond panning areas. These differences include higher fluency, flexibility, and elaboration scores compared to high schools in the suburbs which are very close to the panning area.

However, in terms of originality, schools close to the diamond panning area had better answers than students in the city center.

This research also provides a complete picture of the problems in the form of obstacles and challenges in the development of GCTA in the diamond mining area, Banjarbaru City.

Teachers have done everything to develop students' GCTA but they face many obstacles. These obstacles and challenges include limited time and internet facilities, students' lack of literacy, teachers' difficulties in creating questions and scoring questions that are investigative and problem solving. Other obstacles include different student abilities, teachers' lack of ICT mastery, and only a few teachers carry out environment-based learning. Another thing that needs to be paid attention to is that there are still teachers who do not give students freedom to be creative and use conventional methods in teaching.

This research can provide input to schools, teachers in particular and related institutions to provide the best solutions in developing the creative thinking abilities of students and teachers. It is hoped that this input and information can give birth to new, better policies, such as creating a curriculum that is relevant to the needs of students and teachers in terms of increasing creativity. Apart from that, increasing teacher competency and teacher motivation are also very important things to do.

In the future, further research can be recommended by providing certain treatment to students. The use of constructivist learning methods integrated with technology and environment-based learning resources is appropriate for the development of GCTA. Other recommended further research is how to develop teacher motivation in growing students' GCTA and how teacher competence influences teacher creativity.

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