

An Analysis of Creative Thinking Abilities in Early Childhood Using Graham Wall's Theory

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Abstract :

Children's creativity, defined as the ability to think originally and flexibly, is evident in drawing, playing, and various creations. Observations at Permata Ibu Kindergarten show that students have low curiosity, get bored quickly, are passive, and have limited imagination, which indicates a potential lack of creative thinking skills. This study aims to describe the creative thinking abilities of early childhood children at Permata Ibu Kindergarten. The research was conducted in 2023 using a qualitative descriptive approach, referring to the stages of Graham Wallas' creative thinking process. The research location is Permata Ibu Kindergarten in Palangka Raya, with 5 large group students as subjects. Data collection techniques include observation, unstructured interviews, and tests (writing numbers, reading, writing words/letters, and counting). Data were analyzed using data reduction, data presentation, and conclusion drawing, and their validity was tested thru source triangulation and technique triangulation. The research results show that during the preparation stage, students are able to recognize the types of questions and recall relevant information. During the incubation stage, some students exhibited brief thinking behavior before attempting to solve the problem. During the illumination stage, most students were able to generate ideas or solution steps, although some still struggled to explain their thinking process. During the verification stage, not all students rechecked their answers or generated alternative solutions. Out of the five students, three were at the creative thinking level category 2 (moderately creative), one was category 1 (less creative), and one was category 0 (not creative). These findings indicate variations in creative thinking

abilities among early childhood children and the need for learning strategies that are more stimulating to creativity.

Keywords: Analysis, creative thinking, early childhood, Graham Wall theory.

INTRODUCTION

Creativity itself is not a “privilege” nor is it exclusive to those we categorize as geniuses. This means that genius is certainly a great asset when paired with creativity, but genius is not synonymous with creativity. A figure who perfectly illustrates this is Albert Einstein. Albert Einstein was a genius who was also considered creative, yet the fact is that there are many people whose skills in physics and mathematics surpass those

of Albert Einstein (Bohm, 1998). Creative people share several common characteristics: they enjoy taking risks, possess self-discipline, have the ability to work consistently in their field, enjoy practicing, are motivated to do and develop things, are open-minded, are receptive to new ways of doing things, and are able to adapt well under pressure (Kaufman & Baer, 2005).

Given the importance of creative thinking skills as outlined above, it is only logical that these skills should be developed from an early age. A well-known educational psychologist, Jean Piaget, developed a constructivist theory of development that describes intelligence as a process of adaptation. He further explained in his theory that individuals adapt and modify their knowledge structures in accordance with their environment. Piaget also correlated intelligence with creativity, stating that early childhood is the most creative period of life because children are building their understanding of the world around them. According to Piaget, intelligence develops based on what children do while in their social or physical environments. Through the use of reflective abstraction, a child can generate new concepts that lead to a better understanding and elevate those concepts to a higher level. These new concepts can create complex relationships between actions, objects, ideas, and social experiences. Young children need to learn in an ideal learning environment. The environment is structured in such a way that their full potential can be realized.

Formally, early childhood education falls under an educational framework known as Early Childhood Education. According to Suyadi (2013), Early Childhood Education (PAUD) is education designed to facilitate children's holistic growth and development or to emphasize the development of all aspects of a child's personality. Therefore, PAUD provides children with the opportunity to develop their personalities and potential to the fullest. On this basis, PAUD institutions need to provide a variety of activities that can foster various aspects of development, such as cognitive, language, social, emotional, physical, and motor skills (Rahmadani, 2018).

Creativity in children is the ability to produce original, unusual, and highly flexible thoughts in responding to and developing thoughts and activities (Vidya Fakhriyani, 2016). We can see children's creativity when they play, such as when they draw, arrange games, or create various works. Children can explore spontaneously when they play, in addition, they can also be a channel for channeling their negative emotions. Children's ability to explore is based on their great curiosity about the world around them, which then gives rise to unique ideas in their minds. These ideas are channeled through various activities they do, such as putting together puzzles, coloring, drawing, listening to stories, and so on. Children's creativity will develop well in a conducive environment, namely an environment that is comfortable, safe, and provides a sense of freedom. The creativity that children do also makes them feel happy and satisfied. This feeling of joy and satisfaction then helps children in developing their personalities. While playing, children learn to think and imagine simultaneously, which is then expressed in their creative ideas. Play provides an opportunity for children to be creative by trying new things, facing challenges in novel ways, and even discovering new things. This requires classroom management to ensure learning and play can coexist without sacrificing children's creative thinking skills.

Teachers play a crucial role in managing learning strategies and environments that support this creative thinking process. Using simple logic, we can say that to raise creative children, we need creative teachers. A teacher's creativity is evident when they are able to incorporate variety into their teaching. This variety refers to methods and media designed to meet children's needs, enabling them to express their ideas through

their work—primarily through their creations. Children's creativity can be developed through learning activities that engage their imagination and are enjoyable, packaged within the concept of "learning through play" (Taher & Munastiwi, 2019).

The creative thinking process can be divided into several stages, as per Graham Wallas's theory of the stages of creativity. Wallas's four stages of creativity are preparation, incubation, illumination, and verification (Wallas, 2014). In Stage 1: Preparation, the creative process begins with preparation: gathering information and materials, identifying sources of inspiration, and gaining knowledge about the project or problem at hand. This is often both an internal process (deep thinking to generate and engage with ideas) and an external process (going out into the world to gather the necessary data, resources, materials, and expertise). In Stage 2, or Incubation, the ideas and information gathered in Stage 1 percolate in the mind. As the ideas slowly simmer, the work deepens and new connections are formed. During this germination period, the artist shifts focus from the problem and allows the mind to rest. While the conscious mind wanders, the subconscious engages in what Einstein called "combinatorial play": taking various ideas and influences and finding new ways to combine them. Then, in stage 3, or Illumination, after a period of incubation, an insight emerges from deeper layers of the mind and penetrates consciousness, often dramatically. This is the sudden Eureka! moment that comes while you're in the shower, taking a walk, or otherwise engaged in something completely unrelated. Seemingly out of nowhere, the solution presents itself. And in stage 4, or Verification, whatever ideas and insights emerged in stage 3 are refined and developed. One uses critical thinking and aesthetic judgment skills to hone and refine the work and then communicate its value to others (Gregoire, 2019).

Based on the results of observations conducted by one of the research team members at Permata Ibu Kindergarten, several things were obtained, namely (1) The curiosity of kindergarten students did not appear prominent during the observation, they tended to be quiet and passive. (2) when the opportunity to color, some kindergarten students started drawing without instructions and others waited for instructions. Then some children who felt bored started to stop coloring and did other activities besides coloring, (3) During the learning process, students were also more silent when given the opportunity to ask questions, (4) Most students tended to wait for instructions from the teacher to start work and even a small number did not want to carry out the teacher's instructions even though the instructions had been repeated several times, (5) There was no apparent ability to imagine that was prominent, especially in the works they made, in general, students who were willing to listen to instructions, did their work depending on the teacher's instructions. From several observation findings above, it is strongly suspected that there are problems related to the creative thinking abilities of Permata Ibu Kindergarten students.

Therefore, this study attempts to analyze the description of the thinking abilities of early childhood children at Permata Ibu Kindergarten. The human age from one to five years is a period that greatly determines the quality of human life later. The quality of human life is related to how the education process, treatment, and care in the first five years of life (Musfiroh, 2003). Based on the background explanation above, the researcher is interested in conducting a study with the title "Analysis of Early Childhood Creative Thinking Abilities Using Graham Wall's Theory."

METHODS

The research was conducted in 2023 using a qualitative descriptive approach, referring to the stages of Graham Wallas' creative thinking process. Kamaria (2016)

describes the research methodology used in this study as a qualitative descriptive study conducted with real-world subjects throughout the investigation. This investigation seeks to elucidate all relevant information regarding the creative thinking of students enrolled in early childhood education (PAUD) programs. Graham Wallas's model will be used to conduct this research. The procedures or actions carried out during this investigation are divided into three distinct stages. These stages are as follows:

- a. The initial stage of the procedure is preparation. The researcher will be tasked with the following duties during the preparation stage: (1) drafting a research proposal; (2) obtaining permission from the school administration to conduct the research; (3) processing the research permit; (4) conducting field observations; and (5) designing research instruments.
- b. The second stage is the implementation period. During the implementation phase, the researcher will engage in the following activities: (1) selecting five students to serve as research subjects; and (2) conducting interviews with the students selected for the study.
- c. The final stage of the procedure. After this, the researcher will proceed to the final stage, which involves analyzing the data collected during the research and preparing the research report. The research findings and discussion, as well as conclusions and recommendations, will be included in this report.

Table 1. Analysis of the Creative Thinking Process According to Graham Wallas

Stage	Indicators of Students' Creative Thinking Stages According to the Wallas Model in Problem Solving
Preparation	By gathering relevant material and considering various approaches to the problem, students prepare to solve it. 1) Students understand the introductory material in the provided questions, which includes: 2) Students make a list of their questions and what they already know. 3) Students understand the intent of the questions. Before taking the test, students can refer to the material they received from the teacher or open their textbooks to recall the information they have learned.
Incubation	By gathering relevant material and researching approaches to the problem, students prepare to solve it. 1) Students review the introductory material for the provided questions, which includes: 2) Students make a list of their questions and what they already know. 3) Students understand the intent of the questions. Before taking the test, students can refer to the material provided by their instructor or consult a textbook to recall the information they have learned.
Illumination	After considering the problem-solving procedures, students arrive at a solution. Students will put their ideas into practice as solutions to arrive at the correct answer once they have found inspiration.
Verification	Students check and double-check their solutions to the problem against reality. At this point: 1) Students verify that the answers they have obtained match what is asked in the problem and are accurate. 2) Students find additional solutions to the problem.

(Source: Rudi, 2021).

According to Jamaris (Nuraini, Hartati, & Sihadi, 2020), indicators of creative thinking include: 1. Fluency, or the ability to express ideas accurately and appropriately

2. Flexibility, or the ability to find various solutions to a given problem 3. Originality, or the ability to respond with ideas that originate from one's own thoughts (without copying) 4. Elaboration, or the ability to provide accurate and relevant details when answering questions.

Every student is unique in their thinking, mindset, and level of imagination, and no two works they produce will be the same. The stages of students' creative thinking processes must be measured to identify variations in their thinking, as shown in the following table:

Table 2. Levels of Creative Thinking

Levels	Characteristics
Level 3 (Creative)	capable of problem solving, students are able to demonstrate fluency, flexibility, originality, and elaboration
Level 2 (Moderately Creative)	capable of problem solving, students are only able to demonstrate fluency, flexibility and/or originality
Level 1 (Less Creative)	- capable of problem solving - students are only able to demonstrate fluency
Level 0 (Not Creative)	students are unable to demonstrate the four creative indicators.

(Source: Rudi, 2021).

RESULTS AND DISCUSSION

Results

The following is a description of the creative thinking process in problem solving:

1. Subject R1

- a. Preparation Stage. The subject's creative thinking process in problem solving. This individual has a comprehensive understanding of the initial information presented in the investigation. The subject is able to establish strong connections between the knowledge they have acquired and previously studied content.
- b. Incubation Stage. Subject R1, known for her creativity, immediately found a solution to the problem. This was a consequence of the thorough preparation she had undertaken beforehand, which included studying at home with the help of her husband and children.
- c. Illumination Stage. In this phase, subject R1 was able to solve the problem, both in terms of the process and the final result. She achieved the desired result. R1 acquired a concept for solving the problem by utilizing the previous process, "incubation."
- d. Verification Stage. R1, the subject, is currently in the process of reassessing the responses she has received. Conversely, neither interviews nor observations provide evidence that alternative problem-solving methods exist.

R1, who possesses exceptional abilities, fulfills two attributes of creativity: originality and fluency. According to the thinking level of the highly capable female subject examined, her creative thinking level was level 2, which indicated that she was quite creative.

2. Subject R2

The Subject's Creative Thinking Process in Problem Solving occurs in the following four stages:

- a. Preparation Stage. Subject R2 was unable to comprehend the original information, as indicated by the information provided in the questions. Subject R2 was unable to connect the knowledge he had absorbed with previously acquired information. In a previously shared interview, it was revealed that

Subject R2 struggled with the homeschooling process and spent a lot of time playing games on his phone, unrelated to the subject matter.

- b. Incubation Stage. At this stage, the subject exhibited confused behavior and appeared to be talking to himself. He would occasionally look at his friends' work.
- c. Illumination Stage. Although the subject demonstrated the incubation stage, it did not progress to the illumination stage because he was unable to answer the questions himself. The subject frequently asked other friends for help with the answers.
- d. Verification Stage. The subject did not attempt to find alternative solutions or double-check their work at this stage of the verification process. Furthermore, there appeared to be no other viable alternatives.

Subject R2 experienced problems throughout the creative thinking process according to Graham Wall. Based on the subject's level of creative thinking, the level of creative thinking is at level 0 (not creative).

3. Subject R3

The subject's creative thinking process in solving a problem occurs in the following four stages:

- a. Preparation Stage. Subject R3 was unable to provide a comprehensive explanation of the nature of the investigation. Before beginning the task, it was crucial for him to receive assistance in conducting a brief assessment of the book.
- b. Incubation Stage. Subject R3 did not clearly demonstrate the incubation stage in either interviews or observations; he often assisted his friends with their work.
- c. Illumination Stage. Subject R3 was able to complete the problem well. However, he also frequently helped his friends with their work and simply to ensure their answers were correct.
- d. Verification Stage. Subject R3 verified his answer and was confident that it was accurate and correct. Furthermore, Subject R3 failed to formulate alternative solutions to address the problem raised in the investigation.

Subject R3 only met one of the requirements for creativity: fluency. R3's creative thinking level was at level 1, indicating a lack of creativity.

4. Subject R4

The subject's creative thinking process in solving problems occurred in the following four stages:

- a. Preparation Stage. Subject R4 was able to distinguish the types of problems he would be working on. He also appeared focused on paying attention to the instructions before working on the problems.
- b. Incubation Stage. Subject R4 exhibited behaviors indicative of internal processes at this level, which occur before he considered solutions to the situation. During the pencil shaking process, subject R4 appeared to lean on his hand. The individual demonstrated an effort to recall prior knowledge to identify solutions to the problem during the process.
- c. Illumination Stage. Subject R4 successfully completed the entire problem. One reason for this was the fresh information he had learned from his previous learning activities at home.
- d. Verification Stage. Subject R4 was confident in the accuracy of his answer; however, he did not verify or retest his answer. At this point, Subject R4 made no effort to identify alternative methods for solving the problem.

Subject R4 met all three criteria for creativity: fluency, originality, and uniqueness. He is considered to have a moderate level of creativity, which is marked as level 3.

5. Subject R5

The subject's creative thinking process in solving problems occurred in the following four stages:

- a. Preparation Stage. Subject R5 responded very quickly to the questions, immediately paying attention to the questions distributed to him. He immediately and focused on each question he encountered. However, he was unable to differentiate or clearly identify the types of questions he was working on.
- b. Incubation Stage. During this stage, Subject R5 deftly answered the questions he encountered. R5 exhibited behaviors indicative of the incubation process, albeit only occasionally, such as lifting his leg and shaking his pencil while solving the questions.
- c. Illumination Stage. Subject R5 was greatly assisted by his previous home study activities. This allowed him to quickly identify and then solve the various types of questions. R5's work was also good, and he even occasionally allowed his friends to see his work.
- d. Verification Stage. Subject R5 conducted a thorough assessment of his current work and was confident that his answers were accurate. During this phase, no attempt was made to describe alternative solutions to the problem.

The subject under discussion is R5 creative ability, which encompasses the capacity to demonstrate fluency, originality, and elaboration in problem-solving contexts. Level 2, considered moderately creative, is the level of creative thinking that students possess.

Discussion

Based on the findings above, it is interesting that four of the five subjects who participated in this study exhibited unique behavior. They demonstrated empathy for their peers by helping them solve problems, sharing answers, and even validating their peers' answers. This behavior is called collaboration. Collaborative skills can enhance individual abilities through group collaboration, so for students pursuing education, these skills are like a means to improve their circumstances (Mashud, 2022).

One of the most striking and interesting aspects of this study's findings is the emergence of significant collaborative behavior among most of the subjects. This phenomenon emerged amidst observations of individual creative thinking processes, providing a broader perspective on how students interact not only with problems but also with their social environment. Four of the five subjects—R1, R3, R4, and R5—actively demonstrated collaborative behavior, the manifestations of which varied: from helping friends solve problems, sharing answers, to validating their friends' work. Even Subject R2, although not actively helping, his cheating behavior underscored the need for social interaction and support, albeit in less productive forms.

This collaborative phenomenon is not merely anecdotal, but rather a reflection of a fundamental shift in competency demands in the 21st century. In an increasingly complex and interconnected world, the ability to collaborate, share ideas, and achieve common goals has become as important as—or even more so than—individual brilliance alone. Global organizations such as UNESCO and the OECD have repeatedly emphasized the importance of the 4Cs (Communication, Collaboration, Critical Thinking, and Creativity) as pillars of modern education (Partnership for 21st Century Learning, 2015). In this context, the finding that students spontaneously demonstrate collaborative behavior is a positive indication that the seeds of these competencies have been planted.

Mashud's (2022) definition of collaboration is highly relevant here: a pattern of relationships between individuals or organizations that aspire to mutual sharing, full participation, and agreement on joint action. It involves sharing information, resources,

benefits, and responsibilities in collective decision-making to achieve a common goal or solve a problem. It is not simply working side by side, but rather a mutually beneficial integration of efforts.

In the educational realm, collaboration has been shown to have significant positive impacts. Research shows that collaborative learning environments can increase student motivation, improve learning outcomes, and develop social and emotional skills (Johnson & Johnson, 1999). When students collaborate on problem-solving, they are exposed to diverse perspectives and thinking strategies, which can enrich their understanding and spark new ideas. For example, when R1 helps a friend or R5 allows a friend to review their work, this creates a mini-ecosystem where knowledge and understanding can flow horizontally. R3, who often helps his friend validate answers, also acts as a learning facilitator, even though his own individual creativity level is "low." This suggests that collaborative skills do not necessarily correlate directly with high levels of individual creativity, but can instead serve as a bridge for individuals to complement each other.

Furthermore, the collaborative behavior observed in this study, particularly acts of mutual assistance and sharing, strongly indicates the presence of empathy and altruism in the subjects. Empathy is the ability to understand and feel the emotions of others, while altruism is a selfless act motivated by a desire to help others. In this context, students not only focused on solving their own problems but also showed concern for the success of their peers. This is a concrete manifestation of "a generation capable of empathizing with the well-being of those around them," as concluded in the initial presentation.

The transformation from a competitive mindset to a collaborative and contributive one is central to the shift towards a more sustainable and harmonious society. In the era of globalization, the challenges facing humanity—from climate change to pandemics—require collective solutions. The ability to contribute to the common good, even on a micro-scale, such as in the classroom, is a crucial foundation for building this capacity in the future.

These findings have important pedagogical implications. If collaboration is a natural inclination in students, then education systems must proactively facilitate and incorporate collaborative practices into the curriculum. This could mean: a) Project-Based Learning (PBL) Design: PBL inherently encourages collaboration because students must work together to complete complex projects that require diverse skills and perspectives (Thomas, 2000). b) Emphasis on Group Work: Assigning tasks designed for group completion, where each member has clear roles and responsibilities. c) Facilitating Discussion and Debate: Creating a safe space for students to share ideas, defend arguments, and learn from differences of opinion. d) Communication Skills Development: Training students to listen actively, express ideas clearly, and provide constructive feedback. e) The Teacher's Role as a Facilitator: Teachers shift from being information transmitters to facilitators who guide students in their collaborative process, help them resolve conflicts, and encourage reflection.

While this study separately analyzed the creative thinking process and found collaboration to be an interesting finding, it is important to examine the relationship between the two. Several studies have shown that collaboration can enrich and spark creativity (Sawyer, 2012). When individuals with different ideas interact, they can build on each other's ideas, test assumptions, and reach more innovative solutions than they could have produced individually. For example, although R3 is "less creative"

individually, her ability to help and validate her peers' answers may be a form of collaboration that indirectly supports her peers' creative processes.

However, it is also important to recognize that collaboration does not always guarantee increased creativity. Sometimes, group work can lead to "groupthink" or domination by one or two individuals. Therefore, it is important to design collaborative activities that encourage each member to contribute actively and feel safe to share original ideas.

CONCLUSION

This study analyzed students' creative thinking processes using Graham Wallas's framework, revealing variations in creativity levels among subjects. R1, R4, and R5 demonstrated a relatively good level of creativity, supported by thorough preparation and home learning activities, which enabled them to effectively navigate the creative thinking stages. In contrast, R3 was at a less creative level with limitations in the preparation and incubation stages, while R2 was categorized as non-creative due to significant obstacles across all stages.

Of particular interest was the emergence of collaboration in most subjects. These behaviors of helping each other, sharing answers, and validating reflected strong dimensions of empathy and altruism, indicating that students were not only focused on solving personal problems but also cared about the success of their peers. This is a positive indication that education has successfully cultivated the seeds of 21st-century competencies, where collaboration is an essential skill. While individual creativity varies, the ability to collaborate can serve as a bridge to complement each other and foster learning. These findings underscore the importance of integrating collaborative practices into the curriculum to cultivate a generation that is not only individually intelligent but also capable of contributing positively and empathetically to society.

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