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Systematic literature review: The framework of creative thinking behavior

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Abstract

Creative thinking behavior is an activity in the creative thinking process. Understanding it can help educators design strategies to improve student creativity. The urgency of researching the creative thinking behavior framework is to design effective and appropriate learning strategies. Researchers conducted a systematic literature review to synthesize relevant research as the basis for the preparation of the creative thinking behavior framework. At the SLR stage, validation was carried out by expert judgment on the indicators of creative thinking behavior. The results were analyzed with I-CVI, S-CVI/Ave, and S-CVI/UA, with a value range of 0-1. The results obtained by I-CVI, S-CVI/Ave, and S-CVI/UA received a value of 1, so they are declared valid. The resulting framework includes indicators of creative thinking behavior, which are: (1) Fluency, which is expressing, confirming slowly, and emphasizing a number of ideas or alternative answers; (2) Flexibility, which is identifying, expressing, and classifying approaches or concepts from various perspectives or conceptual approaches in solving problems; (3) Elaboration, which is enriching information, modifying, and marking details of concepts or ideas generated to make them more interesting; and (4) Originality, which is expressing, combining, or modifying different answer ideas to create unique solutions. The research results contribute findings to the development of appropriate learning strategies that encourage creativity.

Keywords: Creative thinking behavior, Framework, Systematic literature review.

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1. Introduction

In the ever-evolving world of education, creativity and creative thinking are developed as important aspects that play a major role in successful learning and facing challenges in the modern era [1]. Creative thinking skills are essential to help

students come up with creative solutions and dare to face new things. Creative thinking allows students to see problems from multiple perspectives, while creativity encourages the exploration of new ideas and the discovery of unique solutions. Developing creativity in education is no easy feat. Educators are increasingly realizing the importance of implementing strategies that can encourage creative thinking and development in learning [2, 3]. Creative thinking encourages flexible thinking and creative activity in students to face complex challenges in an ever-evolving world [4]. It is important to understand creative activity that manifests itself in the form of behaviors to develop creative thinking effectively (Turiman, et al. [5]). Gordon [6] further describes creative thinking as the ability to think "out of the box," examining a problem from multiple angles and making new connections, ultimately leading to more effective problem-solving strategies [7]. Creative thinking behavior is the creative activity that occurs during the creative thinking process. Creativity can be viewed as a product of creative thinking [8]. Research on creative thinking behavior is important to conduct in education to improve the quality of learning and prepare students to face future challenges. Gowan [9] developed the Creative Behavior Inventory (CBI) to measure creative activity and achievement. Runco et al. [10] developed the Runco Ideal Behavior Scale (RIBS) to measure the criteria for creative ideas. Runco's research developed 23 question items to gather information on activities during creative idea generation. The activities that take place during the process have not been identified based on the creative thinking process. It is necessary to start thinking about measuring activities during the creative thinking process through creative thinking behavior based on creative thinking indicators. The measurement of creative thinking behavior can be done, one of them, by using the achievement of creative thinking behavior indicators. Therefore, this research aims to formulate frameworks and indicators of creative thinking behavior.

Conceptual frameworks help organize the processes and skills that support creative thinking, while providing insight into how creativity develops [9, 10]. The creative thinking framework emphasizes key aspects such as fluency of thought, which is the ability to generate many ideas quickly, as well as the skills to innovate and develop ideas further [11, 12]. Some research related to creative thinking and creativity includes individual role identity influencing creative behavior in teams, explaining factors that facilitate or inhibit creativity in the workplace Juniati and Siswono [13]. Samaniego, et al. [14] builds on Sternberg and Lubart [15] basic framework, exploring the role of personality, environment, and cognitive processes in fostering creativity, which significantly contribute to developing indicators of creative thinking.

The preparation of indicators of creative thinking behavior is based on indicators of creative thinking that are linked to indicators of creativity. The creative thinking behavior framework is structured based on the interrelationship of aspects and indicators of creative thinking. The aspects of creative thinking are to generate many ideas quickly and the ability to develop new ideas [16]. This research formulates creative thinking behaviors that are important to help educators observe, develop, and assess creative thinking behaviors, help determine appropriate learning strategies, and assist curriculum developers who focus on measuring creativity effectively. This research uses three stages of Systematic Literature Review (SLR) to produce a creative thinking behavior framework.

2. Literature Review

2.1. Creative Thinking

Guilford [17], an American psychologist in the 1950s, introduced the concept of creative thinking and developed the Structure of Intellect model [18]. Guilford identified several cognitive components that are important in creative thinking, including fluency, flexibility, elaboration, and originality [19]. This model emphasizes the importance of generating many ideas (fluency), the ability to think from various perspectives (flexibility), and developing and enriching ideas (elaboration). Creative thinking is defined as the entire set of cognitive activities that individuals use in dealing with problems, so that they try to use imagination, intelligence, insight, and ideas when they face a situation or problem [20]. Creative thinking also involves the regular activity of searching, enlivening the imagination, developing new potentials, and stimulating unexpected or unique thoughts [21].

2.2. *Creativity*

Aulia, et al. [22] state that creativity is the general ability to discover new things. One of the skills involved is the ability to produce ideas that can be implemented to overcome problems and to see new connections with pre-existing elements. Creativity is determined by the talent and character of each individual, as well as the training process that has been conceptualized. It is viewed as the ability of genius individuals with extraordinary capabilities, involving the activity of the unconscious mind to produce products that are socially regarded as creative [23].

Sadler-Smith [24] who was a psychologist and writer who in 1926 developed the "Four Stages of Creativity" model, which consists of preparation, incubation, illumination, and verification [25]. This model explains the creative process and the stages involved in generating new ideas. Guilford put forward the idea of creativity in the American Psychological Association in 1950, creativity attracted the attention of many experts. Guilford termed it divergent production or divergent thinking and set criteria for creativity based on the degree of novelty of ideas and the frequency of uncommon but acceptable responses Runco and Jaeger [26]. Amabile [27] a psychologist and creativity researcher, developed the "Componential Theory of Creativity" which highlights three main components of creativity namely domain-relevant skills, creativity-

relevant processes, and intrinsic task motivation and focuses on how internal and external factors influence the creative process [27]. Thus, originality and novelty are more appropriately emphasized in the context of uncommon behavior.

2.3. Creative Thinking Behavior

Howard Gardner, a psychologist and educator, is known for his "Multiple Intelligences" theory [28]. Although not directly focused on behavioral indicators of creative thinking, his theories regarding different types of intelligence (e.g., linguistic, logical-mathematical, and interpersonal intelligence) provide insight into how creativity can emerge in different domains and thinking styles. Mihaly Csikszentmihalyi is famous for the concept of "flow", which is an optimal state in which individuals are fully engaged in creative activity [29]. His research shows that creativity is not only related to individual talent, but also to environment and social context. Edward De Bono [30] developed the concept of lateral thinking, which is a creative thinking technique that involves making connections between seemingly unrelated ideas [30]. Estes [31] defined intelligence as adaptive behavior, stating that creativity or creative responses are often not adaptive to a particular environment or within a limited time frame [32]. Creative thinking behavior reflects a person's creative process. Therefore, this behavior can be defined as a series of individual actions or responses when solving problems or tasks, which demonstrate fluency, flexibility, elaboration, and originality through verbs that represent the thinking process.

3. Method

This research focuses on the development of a creative thinking behavior framework based on indicators of creative thinking and creativity, as well as the formulation of indicators of creative thinking behavior. The review using the Systematic Literature Review (SLR) method was conducted systematically based on the guidelines proposed by Kupers, et al. [12] and supported by the methods, reviews, styles, and some figures in this section, which were also motivated by Ramalingam, et al. [33] and Noddings [34]. The Systematic Literature Review (SLR) includes three stages: the planning stage, the conducting stage, and the reporting stage, as shown in Figure 1. Based on Figure 1, there are three stages consisting of nine steps, including the planning stage, conducting stage, and reporting stage. The planning stage begins with identifying the need for a systematic review. Researchers identified concepts related to creative thinking behavior to facilitate the literature review. These concepts became a reference for the formation of a framework, identifying concepts about innovative thinking and its indicators, creativity, and its indicators. In addition, they identified the relationship between the two and found ideas about creative thinking behavior. The second step is to develop the SLR protocol by creating an implementation plan, which includes planning search strategies, determining keywords, and analysis methods. The strategy uses Publish or Perish (PoP) and VOSviewer for search and predefined keywords such as "creative thinking behavior," "creativity indicators," and "creative thinking indicators." Data analysis will be conducted using JASP. The third step is to evaluate the protocol by reviewing the plan and setting a reference for SLR implementation. The conducting stage starts with the fourth step, which is to search for primary studies using the strategy and keywords that have been set through Publish or Perish (PoP).

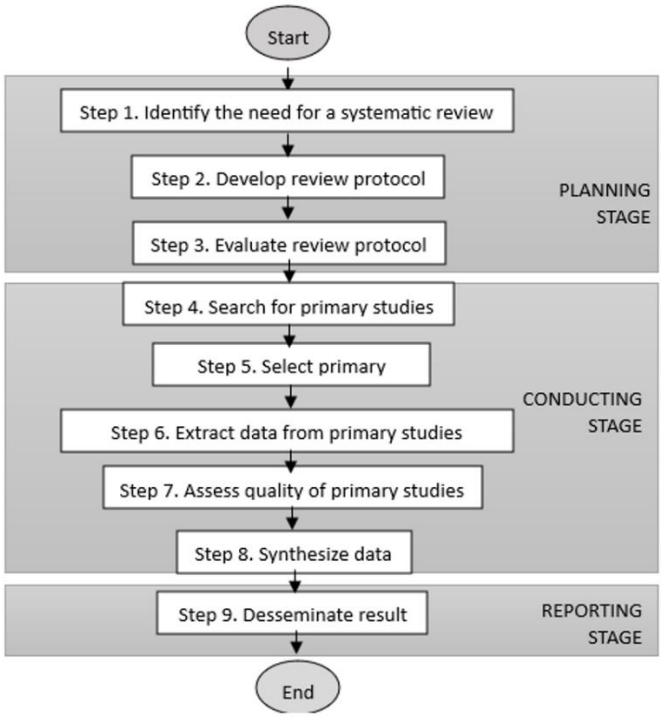

Figure 1.
Research Stages Systematic Literature Review (SLR).

The fifth step involved screening the primary studies from the initial database and importing them into Mendeley for content identification on creative thinking indicators and creativity indicators. The result of the identification in Mendeley

was the final database. The sixth step involved extracting data that focused on creative thinking indicators and creativity indicators. The results of the extraction are then synthesized and analyzed to develop indicators of creative thinking behavior. The seventh step was to assess the quality of the draft indicators through expert judgment, which involved three expert judgments with relevant scientific criteria according to the field of at least ten years [35]. Feedback from expert judgment aims to ensure the content validity of the creative thinking behavior indicators. The eighth step was the synthesis of data from the validation process using the narrative synthesis method to create a creative thinking behavior framework. The development of the framework is done through analysis and synthesis to refine the creative thinking behavior framework by grouping the indicators into several categories. The reporting stage, which is the ninth and final step, is to report the results of the research, including the SLR process, findings, framework development, and research implications. This includes comparing with previous research, evaluating the strengths and weaknesses of the proposed framework, and offering recommendations for future research. The findings will be disseminated to stakeholders and the scientific community through publications, conferences, and focus group discussions (FGDs) to ensure broad impact and relevance in education.

Data analysis involved organizing, evaluating, and integrating information. Data from the selected studies were organized in terms of content related to indicators, methodology, results, and framework. Data quality and relevance were evaluated by assessing the consistency between studies and the significance of indicators. Patterns or trends, such as commonly recognized indicators, were identified. Finally, data synthesis integrates the findings through a narrative synthesis to link indicators and highlight research gaps while suggesting the inclusion of neglected creativity concepts into the existing framework. The conclusion refines the creativity framework, with content validity assessed using the Content Validity Index [33, 35]. This research has received ethical approval from the Faculty of Education, University of Jember (No. 12797/UN25.1.5/SP/2024) and Badan Kesatuan Bangsa dan Politik (BAKESBANGPOL) of Jember Regency, East Java Province (No. 074/2688/415/2024). This research is part of a doctoral dissertation supervised by Dr. Nurcholif Diah Sri Lestari, M.Pd., Dr. Erfan Yudianto, M.Pd., and Dr. Susanto, S.Pd., M.Pd. (No. 001/UN25.1.5/S3MAT/2023).

4. Finding

4.1. Planning Stage

The first step was to identify the need for a systematic review protocol, focusing on the literature related to creative thinking indicators, influencing factors, and the emergence of creativity. In the second step, a protocol was developed to minimize researcher bias, with a plan document and a list of focused questions based on the PICOC criteria [36]. The research questions (RQs) developed include questions related to the creative thinking process, creative thinking indicators, creative thinking outcomes, the creativity process, the relationship between creative thinking and creativity, and the position of creative thinking behavior performed during creative thinking involving creativity. The results of the answers to the research questions (RQs) indicate that the creative thinking process involves four main aspects of creative thinking, namely fluency, flexibility, elaboration, and originality. Each aspect is explained in more detail in the indicators of creative thinking. The results of creative thinking can be realized in creativity. The creativity process is produced through a number of creative thinking behaviors. Creative thinking is a mental process that produces idea exploration and solution findings, so that creativity appears as a concrete result of the creative thinking process. Figure 2 below shows the position of the relationship between creative thinking, creative thinking behavior, and creativity.

Figure 2.
The Relationship Between Creative Thinking, Creative Thinking Behavior, and Creativity.

The keywords that were successfully determined were “creative thinking behavior,” “creativity indicators,” and “creative thinking.” The third step was to evaluate the review protocol by reviewing the plan and assigning references with the help of Publish or Perish (PoP) and Mendeley. The evaluation results included the determination of research questions for identification, keywords, and data-driven search methods planned in the protocol.

Table 1.
Number Of Creative Thinking Indicators Data Base.

Descriptive Statistics													
	2010	**2011**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Valid	2	1	1	1	1	2	3	12	27	38	43	52	46

Note: Excluded 8 rows from the analysis that correspond to the missing values of the split-by variable, years.

Table 2.
Number Of Creativity Indicator Data Base.

Descriptive Statistics																						
	authors																					
	2001	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Valid	2	2	2	1	1	4	3	3	9	9	15	20	6	6	8	8	14	16	16	29	26	16	15

Note: Excluded 6 rows from the analysis that correspond to the missing values of the split-by variable, years.

4.2. Conducting Stage

The results of the fourth step involved searching for primary studies through databases such as Scopus and Google Scholar, using the Publish or Perish (PoP) and Mendeley applications. The following is presented from the database search with keywords. The search with the keyword "creative thinking behavior" did not produce any results, meaning that there were no articles with the main topic on creative thinking behavior. Search results with the keyword "creative thinking indicators" analyzed using JASP are presented in Table 1. The results of the analysis of Table 1 show that the increase in the number of articles in 2022 indicates a significant growth trend in research, driven by increased academic interest, technological developments, and global issues. In the fifth step, 229 titles were identified, and selection was made based on research needs, namely the focus of research topics on creative thinking indicators. Three articles were selected that met the research need of several variations of creative thinking indicators. Further database searches for creativity indicators were conducted, as shown in Table 2.

Table 2 shows 237 article titles obtained using the Scopus and Google Scholar databases on creativity indicators. The fifth stage of primary study selection was the database screening from the previous step. The screening results yielded a total of three eligible articles, but in further exploration of the suitability of the research content, only one article was found to be suitable, namely the research results of S. Vandeleur. Figure 3 below summarizes the overall results of the selected literature study stage relating to creative thinking indicators and creativity indicators.

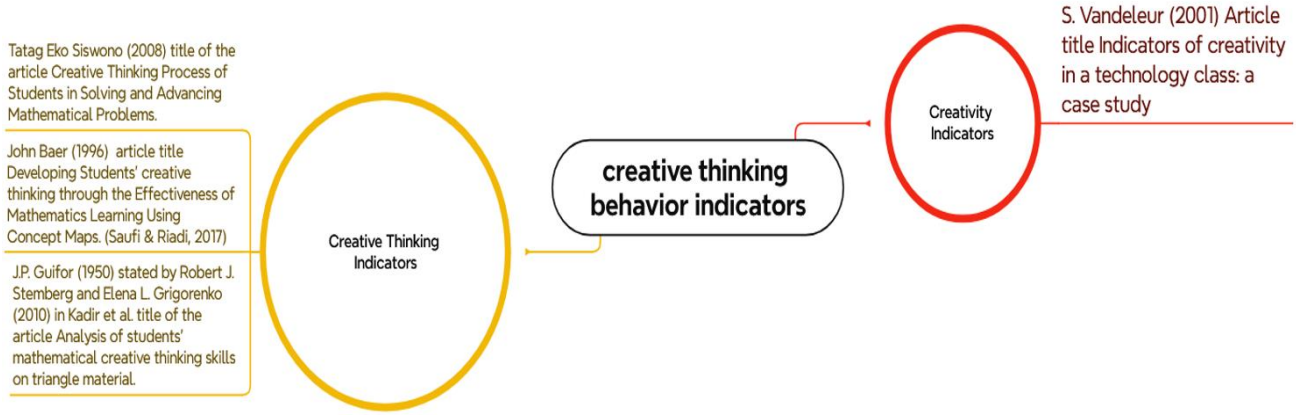

Figure 3.
Results of the Select Primary Studies Stage.
Source: Vandeleur, et al. [37]; Siswono [38]; Baer [39]; Saufi and Riadi [18]; Woolley [40] and Dubois, et al. [41]

The sixth step in this research is to determine the indicators of creative thinking as a reference in formulating indicators of creative thinking behavior. This process was carried out through the analysis and synthesis of Vandeleur's creativity indicators, which include direct indicators (idea generation and experimentation) and indirect indicators (group interaction, prior knowledge, cultural values, motivation, and self-esteem). These indicators were chosen for their comprehensiveness in supporting this research [35]. The integration of creative thinking indicators (CTI) with Vandeleur's creativity indicators (CI) is analyzed in Figure 2, and the analysis of the relationship between these indicators is provided in the Appendix. Figure 4 illustrates the relationship between these indicators in forming the creative thinking behavior indicator (CTBI) through coding (Appendix).

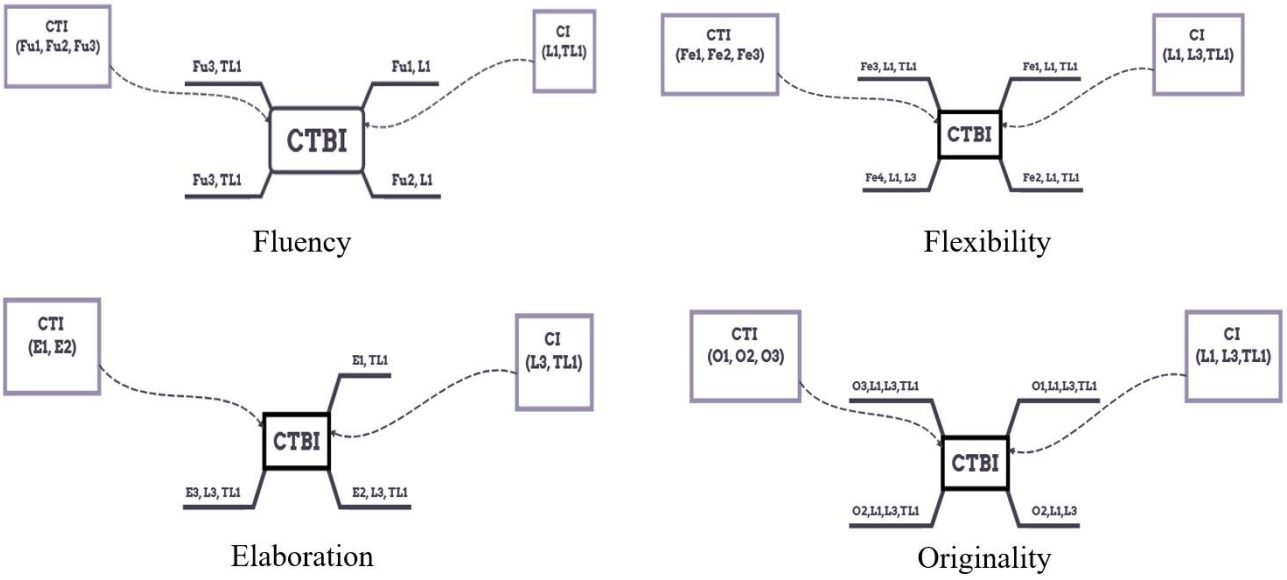

Figure 4.
Construction Of Creative Thinking Behavior Indicators.

The seventh step involved the quality assessment of the preliminary study by three expert judgments (V1, V2, and V3). Each expert judgment conducted three assessments to ensure the validity of the creative thinking behavior indicators. Based on the discussion with the expert judgments, the researcher made several revisions. The summary of the assessment results is presented in Table 4. In the fluency aspect, the assessment results from V1, V2, and V3 provided recommendations to further operationalize some verbs such as "produce," "deliver," "fluently," and "focus." In addition, the recommendation is to use verbs that can be measured and achieved. In the elaboration aspect, V1, V2, and V3 changed "Generate a variety of ideas, questions, or answers (in one topic)" to "Add or enrich information related to ideas/concepts into the answer solution," changed "Add or detail the details of an object" to "Add modifications of various ideas that have been obtained previously," and rewrote "Mark the details of the ideas generated to make it more interesting." In the originality aspect, V1, V2, and V3 revised the concept to produce several unique answers to express original ideas or present new solutions that were not previously thought of.

Table 4.
Recapitulation of Expert Judgement Assessment.

Expert Judgement	n-th Judgement	Score Format	Score For Content	Score For Construction	Score For Construction
V1	1	3.33	2.25	2.80	3.00
	2	4.00	3.25	3.40	3.33
	3	4.00	3.75	3.60	4.00
V2	1	4.00	3.00	3.20	3.30
	2	4.00	3.50	3.00	3.66
	3	4.00	4.00	3.40	4.00
V3	1	3.00	2.25	2.80	3.00
	2	3.33	3.33	3.00	3.30
	3	4.00	3.50	3.40	4.60

Polit & Beck recommend an I-CVI of 1.00 and S-CVI/Ave ≥ 0.90 for three to five experts, while other standards accept a CVI ≥ 0.78 [42]. The validation instrument used a 1-4 scale with the aim of reducing bias and encouraging respondents to provide more affirmative answers by eliminating neutral options [43, 44]. CVI is used for quantitative assessment, including I-CVI (item level) and S-CVI (scale level), with S-CVI/Ave (average I-CVI) and S-CVI/UA (universal agreement). The results of the first assessment showed that the I-CVI score was only 1 for the format assessor, while the assessment of the other three aspects scored ≤ 0.78 in the unfavorable category. The S-CVI/Ave score is 0.66 (the category is not good because it is ≤ 0.90), and the S-CVI/UA score ≤ 0.80 is also not good. Based on these results, revisions were made. In the second assessment, all I-CVI, S-CVI/Ave, and S-CVI/UA scores were 1, categorizing them as good or valid. Although there were still some minor revisions from the expert judgment, another revision was made. The results of the third assessment of the I-CVI, S-CVI/Ave, and S-CVI/UA scores all amounted to 1, categorizing them as good or strong content validity. Expert judgment noted that there were no revisions. Based on the scores and notes of expert judgment from the results of the third assessment, the formulation of creative thinking behavior indicators has been declared valid.

5. Discussion

In the creative thinking framework, behaviors occur during creative thinking, which lead to creativity [45]. The modified creative thinking behavior indicators from Figure 5 include fluency (generating many ideas and answers, giving many suggestions, thinking of more than one answer), flexibility (generating a variety of ideas or answers, considering different perspectives, looking for different answers/methods, changing approaches), elaboration (refining ideas or products, adding details to make them more interesting), and originality (generating unique or different answers, expressing opinions in different ways, combining elements to create non-patterned answers). The creative thinking behavior indicators were declared valid, and the validation data are synthesized in Table 6. The creative thinking behavior indicators in fluency reflect the ability to generate many ideas in a limited time, which is a key aspect of divergent thinking in brainstorming and problem-solving. Runco highlights fluency, flexibility, and originality as important components, which are often assessed through time-limited tests [44, 45]. While quantity is important, ensuring logicality, quality, and relevance are equally important [46, 47]. Generating many ideas without first considering their feasibility can increase the chances of original and innovative solutions emerging [48, 49].

In the fluency aspect, the indicator "express or present a variety of answer ideas in a limited amount of time" shows that the behaviors performed include conveying various ideas quickly and spontaneously, moving from one idea to another smoothly, speaking or writing clearly without hesitation, showing confidence, and managing time efficiently so that all ideas are conveyed within the time limit. The ability to convey ideas quickly and spontaneously is a key indicator of speaking fluency. Research by Ningsih, et al. [50] showed that self-instruction techniques can improve students' oral communication skills, enabling them to express thoughts or ideas orally more effectively in the learning process [50, 51]. The smooth transition of ideas reflects the ability to think in a structured and coherent manner, where effective communication allows for the precise delivery of messages and supports the seamless movement from one idea to another [52, 53]. In the indicator "Slowly ensuring the logicality, quality, and relevance of the answer idea or ideas," the behaviors shown include evaluating ideas before expressing them, comparing answers with prior knowledge, considering suitability to the context of the problem, and composing answers carefully and systematically. Behaviors that arise when individuals answer questions include

reconstructing answers by remembering previous material and ensuring the answer is returned [54]. Revisiting behavior is a creative response in problem-solving activities [55]. In the indicator "Emphasizes the number of ideas or other answer ideas," the behavior of continuing to look for alternatives without directly evaluating is observed. This is in line with the results of research which states that the ability to think creatively can be improved by developing the ability to generate alternative solutions in various contexts [56].

In the flexibility aspect, the indicator "Identify various perspectives or conceptual approaches to solving problems" involves exploring different ways of thinking and analyzing problems from various points of view. This approach is essential in the creative problem-solving and decision-making process, which allows individuals to find multiple solutions and choose the most effective one [57]. By considering diverse perspectives, individuals can address complex problems thoroughly and creatively, synthesizing ideas from multiple frameworks, which encourages creative thinking and flexibility when evaluating various approaches before forming conclusions and justifying reasoning [58]. The indicator "expressing thoughts that are the result of considering different approaches" includes emerging behaviors such as connecting various concepts, comparing alternatives, explaining reasons for choosing solutions, using analogies, thinking flexibly, modifying ideas based on input, and composing thoughts logically. The ability to think flexibly in evaluating and composing ideas from various points of view is often referred to as divergent ability [59]. The indicator "classify approaches or concepts into different groups of similarities (categories)" organizes and simplifies complex information to make it easier to understand. By identifying attributes and creating categories based on similarities, individuals can process information more efficiently and apply concepts effectively across different contexts [26].

The indicator of elaboration is “adding or enriching information related to ideas or concepts into a complete answer solution” by enriching ideas by adding details, examples, or context to increase clarity and depth, strengthening arguments and understanding [26, 58]. The indicator “develop or modify a variety of ideas/ideas obtained previously” corresponds to the statement that developing or modifying ideas based on initial concepts through adaptation, combination, or refinement, to ensure practical and innovative solutions [60, 61]. On the indicator “marking the details of the concept or ideas generated to make it more interesting” with activities to detail, refine and improve ideas, add depth for effective communication and implementation [62].

The indicator of originality is "expressing ideas or notions that are different or never thought of by others." This thinking encourages individuals to break free from conventional patterns and explore unique perspectives that lead to breakthrough solutions. At the same time, the ability to articulate original thoughts enriches personal expression. It contributes to collective knowledge in science, art, and business, emphasizing the importance of generating unique concepts that reflect individual insights and experiences rather than simply adapting existing ideas [57, 61]. Originality is the ability to express ideas or notions that are unique and have never been thought of by others, which is an important aspect of creativity and innovation. It encourages individuals to break away from conventional patterns and explore new perspectives that can lead to innovative solutions. The ability to articulate original thoughts enriches personal expression and contributes to collective knowledge in fields such as science, art, and business. Therefore, creating completely new concepts based on individual insights and experiences is more valuable than simply adapting existing ideas [62, 63]. Original thinking is very important in problem-solving, as it involves combining or modifying different information by synthesizing different ideas to create unique solutions or concepts, both orally and in writing, by combining existing ideas from various sources [64, 65]. By synthesizing various perspectives and elements, individuals can unlock creative and unique solutions that may not be apparent when considering each idea separately [66]. Figure 5 shows the results of developing the framework by adding the results of the creative thinking behavior indicators.

5.1. Reporting Stage

The final step of the research was to disseminate the research results through Focus Group Discussions (FGDs) and publications. The FGD involved 43 participants, including lecturers and students from five universities, to test the relevance of the findings, obtain feedback, and strengthen the implementation of the research results in education. The five universities were STKIP PGRI Situbondo, East Java; Wisnuwardhana University Malang, East Java; Zainul Hasan Genggong University Probolinggo, East Java; Sebelas Maret University Surakarta, Central Java; and Indonesian Christian University Toraja, South Sulawesi. The Focus Group Discussion (FGD) results included constructive feedback from lecturers and students on the relevance, clarity, and implementation of the research findings in an educational context. These discussions helped identify strengths and potential improvements in the research findings while strengthening the validity of the concepts developed.

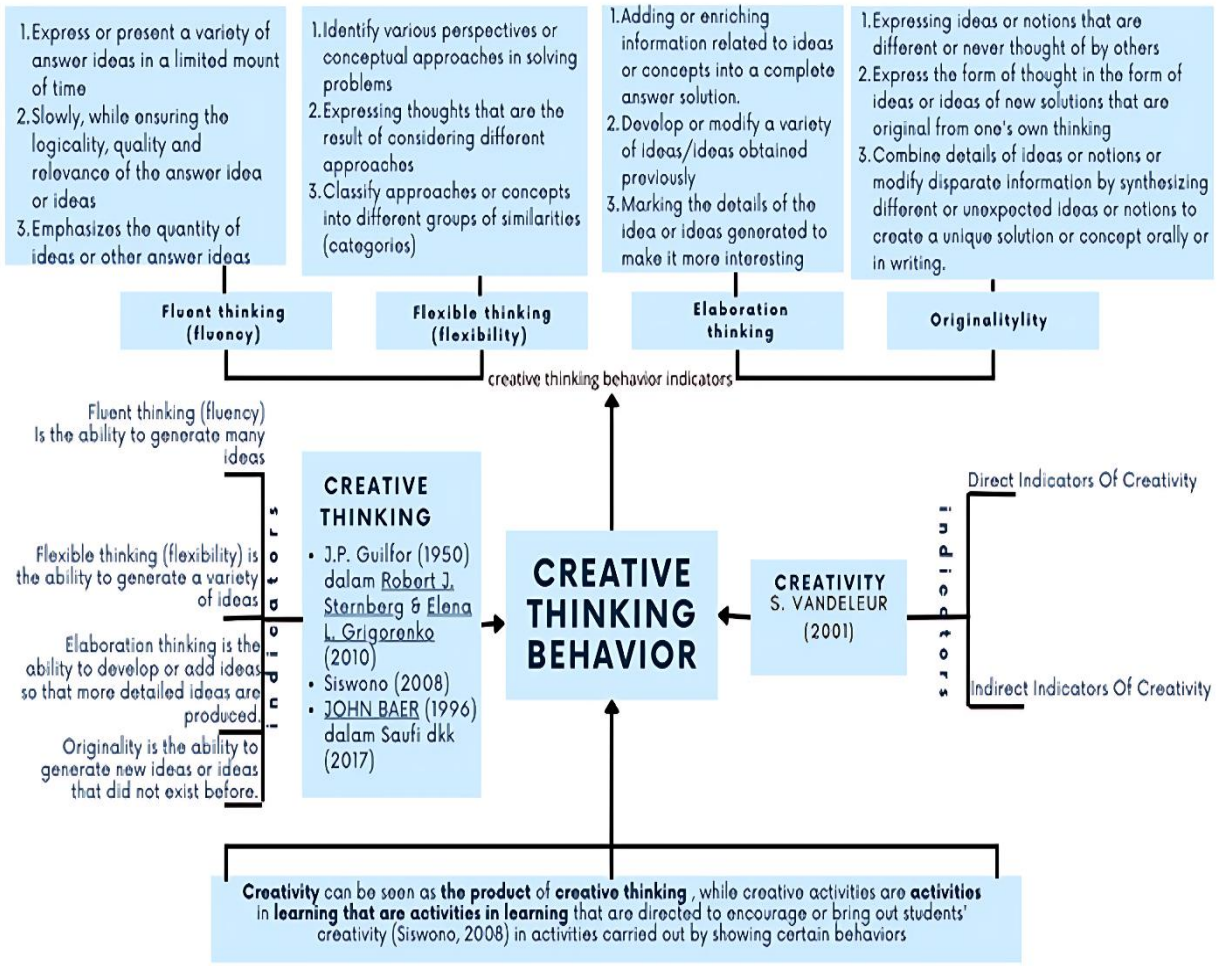

Figure 5.
Framework of Creative Thinking Behavior Indicators.
Source: Vandeleur, et al. [37]; Siswono [38]; Baer [39]; Saufi and Riadi [18]; Woolley [40] and Dubois, et al. [41]

Table 6.
Indicators of Creative Thinking Behavior (Expert Validated).

Indicators of Creative Thinking Behavior/V1	Indicators of Creative Thinking Behavior/V2	Indicators of Creative Thinking Behavior/V3	Indicators of Creative Thinking Behavior (Results)
fluency 1. Conveying/writing a variety of answer ideas in a limited time. 2. Indirect, while checking the logicality and relevance of answer ideas. 3. Focuses on the number of correct answer ideas.	*fluency* 1. Express or present a variety of answer ideas in a limited amount of time. 2. Slowly, while ascertaining the quality and relevance of the answer ideas. 3. Emphasizing the quantity of other ideas or answers.	*fluency* 1. Express or present a variety of answer ideas in a limited amount of time. 2. Slowly, while ascertaining the quality and relevance of the answer ideas. 3. Emphasizing the quantity of other ideas or answers.	*fluency* 1. Express or present a variety of answer ideas in a limited amount of time 2. Slowly ensuring the logicality, quality, and relevance of the answer idea or ideas 3. Emphasizes the number of ideas or other answer ideas
flexibility 1. explore different points of view, approaches, or concepts in solving problems. 2. consider different ideas or approaches. 3. Classify ideas according to different divisions (categories).	*flexibility* 1. Identify various perspectives or conceptual approaches to solving problems. 2. State the thinking that is the result of considering different approaches 3. Classify approaches or concepts into different groups of similarities (categories).	*flexibility* 1. Identify various perspectives or conceptual approaches to solving problems. 2. Expressing thoughts that are the result of considering different approaches 3. Classify approaches or concepts into different groups of similarities (categories).	*flexibility* 1. Identify various perspectives or conceptual approaches to solving problems 2. Expressing thoughts that are the result of considering different approaches 3. Classify approaches or concepts into different groups of similarities (categories)
Elaboration 1. Develop concept ideas into a complete answer solution. 2. Examine the details of the idea, including its impact on various aspects. 3. Collaborate with others to expand or refine idea 4. Adding lines or colors and details or parts to the idea.	*Elaboration* 1. Adding or enriching information related to ideas/concepts into answer solutions. 2. Adding modifications to the variety of ideas/ideas obtained previously. 3. Marking the details of the idea/ideas generated to make it more interesting.	*Elaboration* 1. Adding or enriching information related to ideas/concepts into answer solutions 2. Adding modifications to the variety of ideas/ideas obtained previously. 3. Marking the details of the idea/ideas generated to make it more interesting.	*Elaboration* 1. You are adding or enriching information related to ideas or concepts into a complete answer solution. 2. Develop or modify a variety of ideas/ideas obtained previously. 3. Marking the details of the concepts or ideas generated to make them more interesting.
Originality 1. Thinking of ideas that no one else has thought o 2. Reveal new ideas and or solutions that are original to one's thinking. 3. Combines elements of ideas or modifications by synthesizing different or unexpected aspects of ideas to create a unique solution or concept.	*Originality* 1. Expressing ideas that are different or never thought of by others. 2. Expressing a form of an idea that no one else has thought of. 3. Combine details of ideas or modify different or unexpected information to create a unique solution or concept, either orally or in writing.	*Originality* 1. Expressing ideas that are different or never thought of by others. 2. Expressing a form of idea that no one else has thought of. 3. Combine details of ideas or modify different or unexpected information to create a unique solution or concept orally or in writing.	*Originality* 1. Expressing ideas or notions that are different or never thought of by others 2. Express the form of thought in the form of ideas or ideas of new solutions that are original from one's thinking. 3. Combine details of ideas or notions, or modify disparate information by synthesizing different or unexpected ideas or notions to create a unique solution or concept, either orally or in writing.

6. Conclusion

The creative thinking and creativity framework involves creative thinking behavior, which includes aspects of fluency, flexibility, elaboration, and originality. In detail, each aspect has indicators that detail creative thinking behavior including (1) fluency, which is expressing or presenting various answer ideas in a limited time while still ensuring the logic, quality, and relevance of the answer idea or ideas, emphasizing the quantity of other answer ideas; (2) flexibility, which is identifying various points of view or conceptual approaches in solving problems, expressing thoughts that are the result of considering different approaches, and classifying approaches or concepts into groups that have different similarities (categories); (3) elaboration is adding or enriching information related to ideas into a complete answer solution, developing or modifying various ideas obtained previously, and marking details of the ideas produced to make them more interesting; and (4) originality is expressing ideas that are different or have never been thought of by others, expressing a form of thought in the form of new solutions that are original from one's own thoughts, combining details of ideas or modifying different information by synthesizing different or unexpected ideas to create unique solutions or concepts orally or in writing.

The results of the development of creative thinking behavior indicators can be implemented in developing appropriate learning strategies or methods to explore creative thinking behavior. In addition, collaboration with other approaches, such as Problem-Based Learning (PBL), can be developed to enable creative thinking behavior in problem-solving. Long-term research can also explain the factors that support or hinder the development of creative thinking behavior. Furthermore, research can also be developed related to the implementation of creative thinking behavior assessment in various types of learner diversity based on creative thinking abilities, physical, sensory, intellectual, mental, or emotional limitations. Characteristics or profiles are further research that is also important to conduct to show in detail the creative thinking behavior in certain conditions.

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Appendix

Construction of Creative Thinking Behavior Indicators.

This indicator of creative thinking behavior is only the result of construction; it has not yet been validated. The results of the validation of indicators of creative thinking behavior can be seen in Table 6.

Indicators of Creative Thinking (Construction Result)	**Indicators of Creativity (S. Vandeleur)**	**Creative Thinking Behavior Indicator**
a. *fluency* (Fu) 1. Generates many ideas and answers from various patterns fluently. (Fu1) 2. It provides many ways/suggestions for doing many things. (Fu2) 3. Thinks of more than one answer. (Fu3)	a. Direct indicators of creativity (L): 1. Generate ideas (ideality, originality, critical thinking, fun, aesthetic appreciation of skills). (L1) 2. experimentation (risk-taking, cycle procedures). (L2) 3. persistence. (L3) b. Indirect indicators of creativity (TL): 1. Working group interaction. (TL1) 2. pre-knowledge. (TL2) 3. cultural influences and values. (TL3) 4. motivation. (TL4) 5. Self-esteem. (TL5)	a. Express ideas fluently (Fu1, L1) b. Ask many problem-solving questions (Fu1, L1) c. Answering questions (problems) with several varied answers (Fu2, L1) d. Presents many variations of an answer to a problem (Fu2, L1) e. Work quickly and do more problem-solving than other children (Fu3, TL1) f. Looking carefully and quickly for flaws or mistakes in an idea or problem (Fu3, TL1)
b. *Flexibility* (Fe) 1. Generates various ideas, questions, or answers (within one topic). (Fe1) 2. Identifies problems from different points of view as alternatives. (Fe2) 3. Seeks many different answers/methods. (Fe3) 4. Able to change approach or thinking. (Fe4)		a. Give different interpretations of a picture, story, or problem (Fe1, L1, TL1) b. Able to spontaneously change the direction of thinking (Fe2, L1) c. Classifying things according to different divisions (categories) (Fe2, L1) d. Apply a concept or principle in different ways (Fe3, L1, TL1) e. Considers the situation that is different from that given by others (Fe4, L1, L3)
c. *Elaboration* (E) 1. Able to enrich and develop ideas or products. (E1) 2. Adding or detailing details of an object, idea, or situation to make it more interesting. (E2)		a. Seeking deep meaning in the answer or solution to a problem by going through detailed steps (E1, TL1) b. Enrich or develop the ideas of others (E1, TL1) c. Trying out or testing details to see which direction to take (E2, L3, TL1) d. Has a strong sense of beauty that is not satisfied with an empty or lonely appearance (E2, L3, TL1) e. Adding lines or colors and details or parts to his/her own or others' drawings (E2, L3, TL1)

Indicators of Creative Thinking (Construction Result)	**Indicators of Creativity (S. Vandeleur)**	**Creative Thinking Behavior Indicator**
d. *Originality* (O) 1. Generate multiple but correct answers, or one of them is unique or unusual in its level. (O1) 2. Thinks of an unusual way of expressing his/her opinion. (O2) 3. Combining certain elements produces different answers that do not follow a pattern. (O3)		a. Thinking of problems or things that no one else has thought of (O1, L1, L3, TL1) b. Express new ideas that are original to one's thinking (O2, L1, L3) c. Thinking about existing methods and trying to find new and different ones (O2, L1, L3, TL1) d. Choosing a new step in drawing or illustrating something according to his/her excretion (O2, L1, L3) e. Make modifications by synthesizing parts of the problem in its solution (O3, L1, L3, TL1)