turnitin unesa1

SIMILARITY_220 (V.2 N.3)

CEK TURNITIN

Document Details

Submission ID

trn:oid:::3618:1449353181

Submission Date

Jul 5, 2026, 7:29 PM GMT+7

Download Date

Jul 5, 2026, 7:31 PM GMT+7

File Name

Cek 220. pdf

File Size

288.6 KB

12 Pages

4,166 Words

28,322 Characters

*% detected as AI

AI detection includes the possibility of false positives. Although some text in this submission is likely AI generated, scores below the 20% threshold are not surfaced because they have a higher likelihood of false positives.

Caution: Review required.

It is essential to understand the limitations of AI detection before making decisions about a student's work. We encourage you to learn more about Turnitin's AI detection capabilities before using the tool.

Journal of Law and Bibliometrics Studies
Homepage : https://journal.i-ros.org/index.php/JOLABIS
Email : jolabis@i-ros.org

e-ISSN 3109-3310
Vol. 2, No. 3, December 2026

A Bibliometric Analysis and Systematic Literature of Scopus Indexed Journals of Mathematical Creativity Assessment

Nadya Dewinda Agustin*, Mohammad Syarif Sumantri, Arita Marini

Universitas Negeri Jakarta, Jakarta, Indonesia

Check for updates OPEN ACCESS CC BY

DOI : https://doi.org/10.63230/jolabis.2.3.220

Sections Info

Article history:
Submitted: May 25, 2026
Final Revised: June 06, 2026
Accepted: June 07, 2026
First Available Online: July 05, 2026
Published: December 27, 2026

Keywords:
Bibliometric;
Creativity Asessment;
Literature Review;
Mathematic.

ABSTRACT

Objective: *Mathematical creativity plays a crucial role in enhancing the quality of life, resolving challenges, driving change, and improving the efficiency and effectiveness of systems. The objective of this study is to analyze publications from Scopus-indexed journals that investigate the effectiveness of techniques in estimating mathematical creativity.* ***Method:*** *This research is a literature review that utilizes bibliometric analysis in RStudio and the PRISMA technique.* ***Results:*** *This research emphasizes the efficacy of open-ended problem-solving and some frameworks in boosting mathematical creativity. It also uncovers the potential of augmented reality and cooperative learning methodologies in strengthening students' cognitive and creative abilities. Our in-depth study highlights the need for ongoing research and novel pedagogical practices to fully use the advantages of these techniques and instruments in promoting critical and creative thinking in mathematics education.* ***Novelty:*** *The uniqueness of this research lies in the development of a mathematical creativity instrument that integrates analogical and divergent thinking skills into a single measurement model. This instrument provides a more comprehensive assessment of creativity than conventional instruments that focus solely on mathematical knowledge.*

INTRODUCTION

Mathematical creativity is evaluated based on two factors: divergent thinking and the capacity to overcome mental fixations in mathematics (Yang, 2023). These debates provide substantial questions for mathematics instructors about their goals and approaches in teaching mathematics. Given the specialized nature of mathematics, the study of mathematical creativity can be approached from several perspectives. Mathematical creativity is distinct from other forms of creativity, although it has similarities with other scientific fields in the process of knowledge creation (Bicer et al., 2020; Jatiariska et al., 2022).

The instrument, "Creativity in Mathematics," is designed to evaluate pupils' ability to think creatively when solving mathematical problems. From Polya's perspective (Hensberry & Jacobbe, 2012; Polya, 1945), practically all issues in mathematics are connected to previously solved problems since mathematical information is preserved in the form of established theorems (Ying et al., 2024). When individuals face a novel situation, they draw on the knowledge and skills they have acquired by resolving similar problems. When faced with difficulties understanding a subject, individuals often attempt to establish connections using analogies (Whittle et al., 2023). Despite the common use of analogical thinking in several multiple-choice tests to assess mathematical aptitude or reasoning, researchers in the field of creativity have not included analogical thinking into the development of creativity tests (DeHaan, 2009; Kao, 2022; Tall, 2014). Indeed, most paper-and-pencil exams assessing mathematical creativity have focused on evaluating divergent thinking alone.

Nevertheless, measuring analogical thinking in mathematics can also be conducted within the context of divergent thinking. For instance, individuals can create several analogies to solve a mathematical problem. The number of analogies produced may be seen as a measure of fluency, the conceptual classifications of analogies as a measure of flexibility, and the scarcity of analogies as an indicator of originality. The reflections and self-examinations of innovative mathematicians are excellent resources for comprehending the process of mathematics innovation.

Mathematics academics focusing on creativity have emphasized the significance of problem solving and problem posing, while neglecting other crucial aspects of mathematical innovation (Di et al., 2022; Maher et al., 2023). As researchers in the field of creativity, it is necessary for us to carefully examine the role of selection in the creative process and then create tools to assess the selection process or aptitude as a fundamental aspect of creativity (Agiestanto et al., 2020). Regrettably, the measurement of mathematical creativity is lacking because the instrument primarily confirms instructors' explanations through mathematical problems, thereby measuring only students' knowledge.

Hence, it is essential to suggest that being skilled in computer use may help students enhance their creativity, critical thinking, and problem-solving skills (Mulawarman, 2024; Razak et al., 2022). Every student, especially those with innate mathematical ability, needs a combination of demanding academic challenges and creative opportunities to explore the core of mathematics and use their refined abilities. The literature recognizes the importance of promoting mathematical creativity, yet also highlights the lack of initiatives in schools to identify or nurture this facet of students' capabilities.

RESEARCH METHOD

To address the research issues and handle the large volume of data, a two-stage strategy was used, including a bibliometric analysis and a systematic literature review. The first phase included a bibliometric investigation to identify scholarly studies on mathematical creativity assessment, as well as databases and information sources (Bilgic & Baloğlu, 2025; Verger et al., 2024). The study relied on papers published in reputable international databases, such as Scopus. The search technique requires specific keywords to gather a comprehensive collection of research focused on the assessment of mathematical creativity. Figure 1 displays the two phases of the research plan.

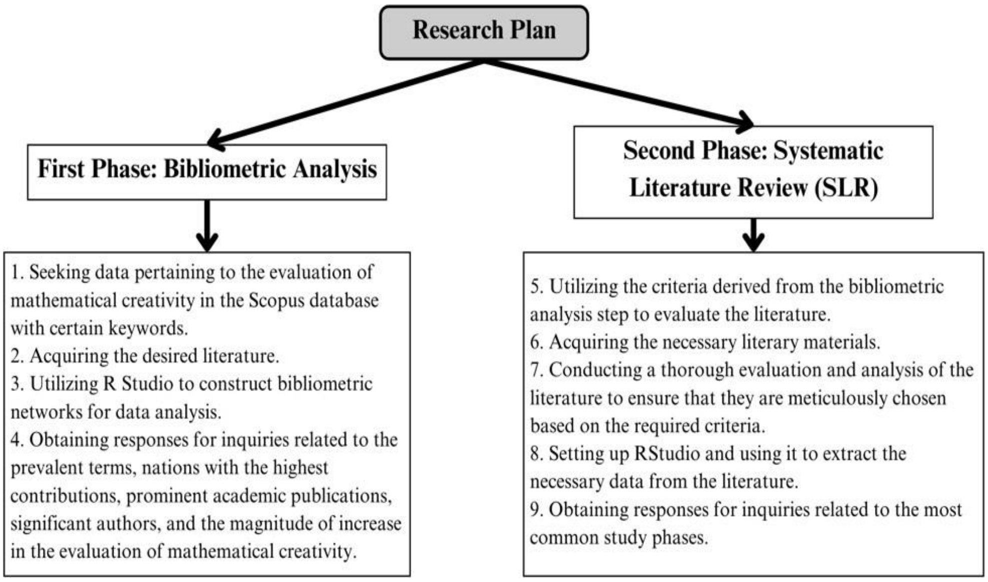
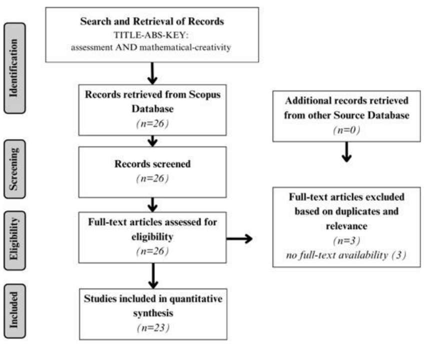
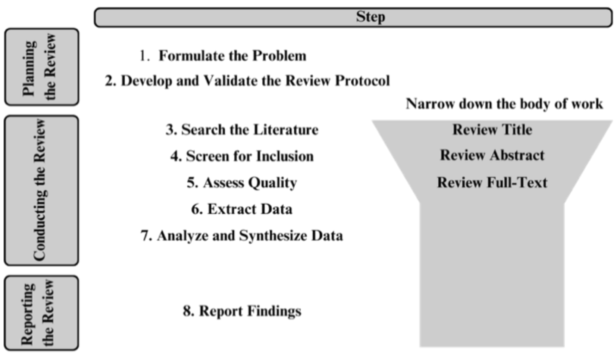


Figure 1. Research plan

The first phase of the study employs a bibliometric analysis. Bibliometric analysis enables researchers to understand a particular subject's research status and trend. The systematic literature review procedure follows each step as outlined in the updated PRISMA flowchart, shown in Figure 2(a) (Agrawal et al., 2024; Mangas-Vega et al., 2018). To streamline the search for relevant material, the author defines the issue that will serve as the article's central focus. This article employs a systematic literature review as the second phase of methodology (Wen et al., 2025). A review is an evaluation of an existing collection of material, involving a clear technique for finding, evaluating its quality, and synthesizing it with a high level of impartiality, as illustrated in Figure 2(b). Systematic literature reviews are highly valuable for analyzing extensive datasets, as they enable the identification of treatment patterns and facilitate the rapid reduction and selection of the most relevant references (Kraus et al., 2020). This selection process is always conducted according to pre-established criteria set by the researchers (11). A revised iteration of the systematic literature review procedure shown in Figure 3 (Pang et al., 2023; Xiao & Watson, 2019).



(a)



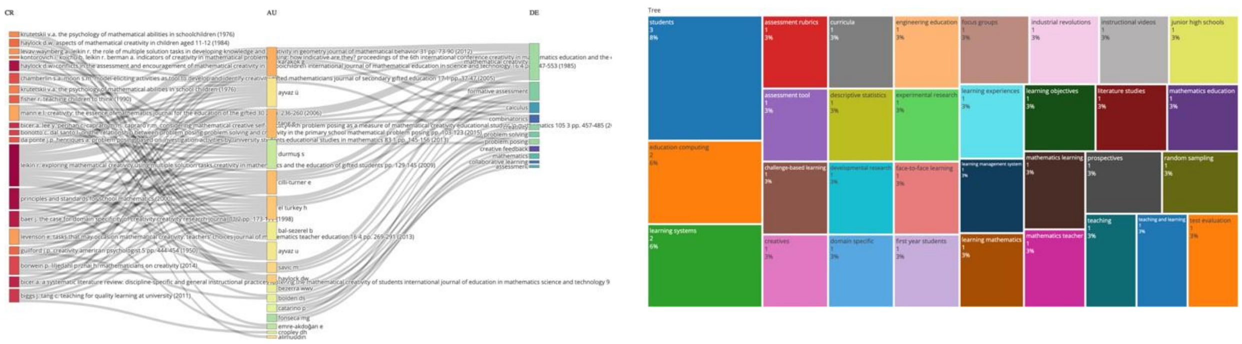
(b)

Figure 2. a)PRISMA diagram for reporting relevant materials (b) SLR process

RESULTS AND DISCUSSION

Results

Mathematical creativity has had a significant rise in academic publications due to its quick evolution. Understanding the relationships among key contributors, prevailing research topics, and prominent publishing venues is essential for both academics and practitioners. Figure 3(a) describes it. Authors like Leikin R., Silver E. A., and Sriraman B., are often linked with terms such as "mathematical-creativity," "formative assessment," "problem posing," "problem solving," and "creative feedback." This demonstrates their substantial contributions to these crucial domains in data analytics. Keywords such as "mathematical creativity" and "assessment" are closely associated with prestigious publications, including the International Journal of Mathematical Education in Science and Technology, which have significant influence. This indicates that these publications are prominent outlets for innovative research in these areas. The thickness of the lines linking these entities visually represents the frequency and intensity of their relationships, providing a clear picture of collaboration networks and areas of study focus.



(a) (b)

Figure 3. (a) Three-Field Plot: The interrelationships and interconnectedness of nations, authors, and references. (b) Treemap of words

Figure 3(b) visually depicts the words that appear most often in studies on assessing mathematical creativity. The phrases "students" (8%) and "education computing" and "learning systems" (6%) are the most prominent in this context. Additional important phrases in this context include "assessment," "mathematics-learning," "learning-mathematics," and "mathematics-teacher," each representing crucial thematic topics in the subject, with a weightage of 3% each. Figure 4 illustrates the countries with the highest number of citations, showcasing the primary contributors to the subject of mathematics-creativity. Romania, Portugal, and the USA are identified as the top three nations in terms of citation impact. Meanwhile, the total number of times important phrases have been used over the years shows a notable increase in the use of "creatives," "assessment," and "students," suggesting shifts in research patterns and core areas of focus in the field. These visualizations provide essential insights into the spatial distribution of relevant research and the chronological development of important ideas in the literature.

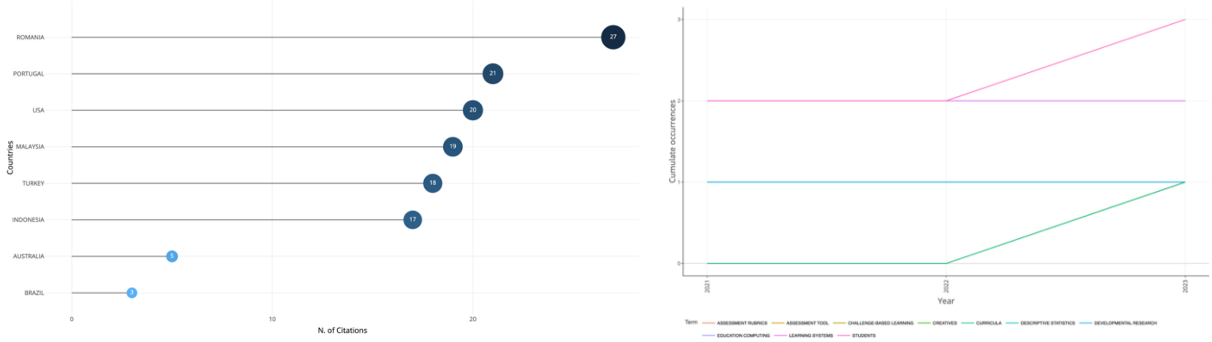


Figure 4. Most cited countries and cumulate occurences words in year

Discussion

Through the SLR process, many approaches need to be considered for constructing an assessment of mathematical creativity. Various assessment methods, including objective and subjective approaches, have been used to quantify mathematical creativity. The assessment techniques may be classified into four categories: paper-and-pencil assessment, assessment via observation, assessment through interviews, and self/others assessment (Atwany et al., 2022; Sak et al., 2017). Cooperative efforts are preferable to individual and competitive efforts when there is a higher level of issue-solving and a greater need for innovative decision-making. Using a cooperative learning approach helps develop students' critical and creative thinking. Critical thinking encompasses both deductive and divergent thinking, since both critical and creative thinking are interconnected and mutually supportive facets of sophisticated cognition (Catarino et al., 2019; Lamri et al., 2025).

The objective of constructing an assessment of mathematical creativity was also to identify patterns in students' mathematical learning and cognitive processes. The sequential way of thinking is often linked to rule-obeying behavior and systematic techniques, which have been observed to clash, to some degree, with the requirements of mathematical creativity (Bokhove et al., 2023; Haylock, 1985(a)). Problem-posing exercises provide educators with a holistic understanding of students' mathematical aptitude (Emre-Akdogan, 2023; Zainudin et al., 2019). The results of these exercises indicate that students can develop favorable attitudes such as motivation, persistence, and willingness to take risks (Ardiansyah et al., 2021; Haylock, 1985(a); Haylock, 1985(b); Kwek, 2015). Since conventional assessments do not effectively evaluate or detect creativity, although they typically provide rewards or incentives (Idris & Nor, 2010; Long et al., 2022). However, for this integration to occur, teachers must recognize the significance of problem-posing and create learning environments that encourage students to formulate their own problems (Ayvaz & Durmuş, 2021).

Students' performance should also be assessed based on both their ability to understand and apply complex concepts and their capacity for creative thinking and reflection (Karafil & Karakuyu, 2026; Omar et al., 2019). Assessing a versatile problem-solving assessment tool that may be used to quantify the extent of mathematical creativity in students (Yasemin & Kadir, 2025; Zainudin et al., 2019). In addition, open-ended tasks may be presented to encourage the investigation of open-ended solutions (Rahayuningsih et al., 2021; Turkey et al., 2024). It is remarkable to see the inventive results that children can achieve when given liberty by involving them in unstructured inquiries, which include self-assessment and self-reflection, so improving their belief in their own capabilities (Alimuddin et al., 2021; Omar et al., 2019; Rafi & Retnawati, 2022; Singer et al., 2017). The analytical results demonstrated that the open-ended problem-solving assessment was a dependable and effective approach for assessing students' mathematical creativity, including both their solutions and the strategies they used. Furthermore, the link between problem-solving and problem-posing in terms of mathematical inventiveness is used to cultivate the creative capacities of high-achieving or exceptional students (Sadak et al., 2022).

The capacity to evaluate creativity for both developmental and evaluative objectives is also crucial (Guo et al., 2023; Tan et al., 2014). Various avenues for advancement exist, including the development of critical and creative thinking, the use of creative peer feedback, and the stimulation of creativity across diverse domains of knowledge through creative feedback (Bezerra et al., 2021). With each piece of feedback, the individual is prompted to reflect, analyze, and evaluate their own views. In this scenario, the development of creativity and critical thinking is heightened, particularly among those who provide feedback, as they must examine their peers' responses (Marrone et al., 2023).

CONCLUSION

Fundamental Finding: This study, conducted using the PRISMA framework and bibliometric analysis, presents a thorough examination of evaluation methodologies and instructional practices for assessing mathematical creativity. Our study emphasizes the significance of assessing students' creativity in comprehending and applying complex ideas, alongside their ability for discerning thinking and introspection. The introduction of open-ended challenges is useful in promoting creativity, as seen by the innovative solutions generated by pupils. The effectiveness of open-ended problem-solving in boosting mathematical creativity is supported by important factors such as cognitive flexibility. **Implication:** The results indicate that the inclusion of problem-posing exercises and self-assessment assignments may have a substantial positive impact on students' academic achievements and self-assurance. Combining problem-posing with standard problem-solving exercises enhances the educational experience by enabling students to delve into mathematical ideas in depth and with creativity. **Limitation:** This research is limited to an analysis of the literature available in the selected databases, so relevant studies may have been omitted. Furthermore, the findings have not been validated through classroom implementation, so the effectiveness of the proposed recommendations requires further testing. **Future Research:** The analysis also highlights significant deficiencies in existing creativity measures, such as a lack of precision, inconsistency, and limited practicality in classroom settings. Our comprehensive research demonstrates the need to use collaborative learning methods to enhance students' cognitive and creative abilities. It stimulates critical and innovative thinking, which is crucial for addressing intricate mathematical issues. By promoting universal generalizations and adaptable cognitive processing, educators can create an environment that fosters mathematical creativity. This study highlights the need for ongoing research and adjustment of educational practices to fully realize the potential of novel teaching techniques and evaluation systems in mathematics education.

ACKNOWLEDGEMENT
The funding for this research was provided by the PMDSU programme, which is managed by the Directorate General of Higher Education, Research and Technology under the Ministry of Education, Culture, Research and Technology of Indonesia

AUTHOR CONTRIBUTIONS
Nadya Dewinda Agustin led the research, manuscript writing, processed and analysed bibliometric data. **Mohammad Syarif Sumantri** performed data validation and discussion. **Arita Marini** supported the literature search, reference compilation, and final editing. All authors approved the final manuscript.

CONFLICT OF INTEREST STATEMENT
The authors declare that there are no conflicts of interest, either financial or personal, that could influence the content or results of this study.

ETHICAL COMPLIANCE STATEMENT
This article has met the standards of research and publication ethics. The author affirms that this research is original, conducted with academic integrity, and free from unethical practices, including plagiarism.

STATEMENT ON THE USE OF AI OR DIGITAL TOOLS IN WRITING
The final responsibility for the content of the manuscript rests entirely with the authors. The author declares that this manuscript was prepared entirely without the assistance of artificial intelligence (AI) or other digital tools. The entire process, from planning, data processing, analysis, to writing and editing the manuscript, was carried out manually by the author. Thus, full responsibility for the content and authenticity of this article rests solely with the author.

REFERENCES
Agoestanto, A., Sukestiyarno, Y. L., Isnarto, I., & Rochmad. (2020). Analysis of mathematics modeling student ability in algebraic critical thinking and form of the scaffolding. In *Proceedings of the International Conference on Science and Education and Technology (ISET 2019)* (Advances in Social Science, Education and Humanities Research, Vol. 443, pp. 210–216). Atlantis Press. https://doi.org/10.2991/assehr.k.200620.041

Agrawal, S., Oza, P., Kakkar, R., Tanwar, S., Jetani, V., Undhad, J., & Singh, A. (2024). Analysis and recommendation system-based on PRISMA checklist to write systematic review. *Assessing Writing, 61*, 100866. https://doi.org/10.1016/j.asw.2024.100866

Alimuddin, Ruslan, & Nashrullah. (2021). Effectivity of the mathematics learning model ICCACRE in developing mathematics creativity of junior high school students. *Journal of Physics: Conference Series, 1899*(1), 012129. https://doi.org/10.1088/1742-6596/1899/1/012129

Ardiansyah, A. S., Mulyono, Mashuri, Fiyanti, R. A., & Hamidah, F. S. (2021). CB-BL model (challenge based on blended learning) for mathematical creativity. *Journal of Physics: Conference Series, 1918*(4), 042065. https://doi.org/10.1088/1742-6596/1918/4/042065

Atwany, M. Z., Sahyoun, A. H., & Yaqub, M. (2022). Deep learning techniques for diabetic retinopathy classification: A survey. *IEEE Access, 10*, 28642–28655. https://doi.org/10.1109/ACCESS.2022.3157632

Ayvaz, Ü., & Durmuş, S. (2021). Fostering mathematical creativity with problem posing activities: An action research with gifted students. *Thinking Skills and Creativity*, *40*, 100846. https://doi.org/10.1016/j.tsc.2021.100846

Bezerra, W. W. V., Gontijo, C. H., & Fonseca, M. G. (2021). Fostering mathematical creativity in the classroom through feedbacks. *Acta Scientiae, 23*(2), 88–112. https://doi.org/10.17648/acta.scientiae.6213

Bicer, A., Lee, Y., Perihan, C., Capraro, M. M., & Capraro, R. M. (2020). Considering mathematical creative self-efficacy with problem posing as a measure of mathematical creativity. *Educational Studies in Mathematics, 105*(3), 457–485. https://doi.org/10.1007/s10649-020-09995-8

Bilgic, S., & Baloğlu, M. (2025). A bibliometric analysis of research on giftedness and mathematics. *International Journal of Mathematical Education in Science and Technology*, *56*(3), 382-398. https://doi.org/10.1080/0020739X.2023.2236611

Bokhove, C., Xenos, M., & Mavrikis, M. (2023). Using social network analysis to gain insight into social creativity while designing digital mathematics books. *Social Sciences & Humanities Open*, *8*(1), 100497. https://doi.org/10.1016/j.ssaho.2023.100497

Catarino, P., Vasco, P., Lopes, J., Silva, H., & Morais, E. (2019). Cooperative learning on promoting creative thinking and mathematical creativity in higher education. *REICE. Revista Iberoamericana Sobre Calidad, Eficacia y Cambio En Educacion*, *17*(3), 5-22. https://doi.org/10.15366/reice2019.17.3.001

Dehaan, R. L. (2009). Teaching creativity and inventive problem solving in science. *CBE – Life Sciences Education*, *8*(3), 172-181. https://doi.org/10.1187/cbe.08-12-0081

Arrahim, R. E. S., & Lestari, S. P. (2022). Strategi pembelajaran rotating trio exchange (RTE) terhadap hasil belajar matematika di sekolah dasar. *Jurnal Elementaria Edukasia*, *5*(2), 227-239. https://doi.org/10.31949/jee.v5i2.4181

El Turkey, H., Karakok, G., Cilli-Turner, E., Satyam, V. R., Savić, M., & Tang, G. (2024). A framework to design creativity-fostering mathematical tasks. *International Journal of Science and Mathematics Education*, *22*(8), 1761-1782. https://doi.org/10.1007/s10763-024-10449-3

Emre-Akdoğan, E. (2023). Examining mathematical creativity of prospective mathematics teachers through problem posing. *Teaching Mathematics and its Applications: An International Journal of the IMA*, *42*(2), 150-169. https://doi.org/10.1093/teamat/hrac006

Guo, Y., Lin, S., Williams, Z. J., Zeng, Y., & Clark, L. Q. C. (2023). Evaluative skill in the creative process: A cross-cultural study. *Thinking skills and creativity*, *47*, 101240. https://doi.org/10.1016/j.tsc.2023.101240

Haylock, D. W. (1985a). Conflicts in the assessment and encouragement of mathematical creativity in schoolchildren. *International Journal of Mathematical Education in Science and Technology, 16*(4), 547–553. https://doi.org/10.1080/0020739850160412

Haylock, D. W. (1985). High mathematical creativity in a pair of identical twins. *The Journal of genetic psychology*, *146*(4), 557-560. https://doi.org/10.1080/00221325.1985.10532476

Hensberry, K. K., & Jacobbe, T. (2012). The effects of Polya's heuristic and diary writing on children's problem solving. *Mathematics Education Research Journal*, *24*(1), 59-85. https://doi.org/10.1007/s13394-012-0034-7

Idris, N., & Nor, N. M. (2010). Mathematical creativity: Usage of technology. *Procedia - Social and Behavioral Sciences,* 2(2), 1963–1967. https://doi.org/10.1016/j.sbspro.2010.03.264

Jatiariska, I. G. A., Witraguna, K. Y., & Wijaya, I. K. W. B. (2022). Pendekatan matematika realistik berbasis pembelajaran daring pada siswa sekolah dasar. *Jurnal Elementaria Edukasia, 5*(1), 101–111. https://doi.org/10.31949/jee.v4i1.3771

Kao, C. Y. (2022). How broad cognitive abilities contribute to traditional analogies, creative analogies, and general creativity. *Thinking Skills and Creativity*, *45*, 101068. https://doi.org/10.1016/j.tsc.2022.101068

Karafil, B., & Karakuyu, A. (2026). The mediating role of critical thinking in the relationship between creative thinking and reflective thinking. *European Journal of Education*, *61*(1), e70360. https://doi.org/10.1111/ejed.70360

Kraus, S., Breier, M., & Dasí-Rodríguez, S. (2020). The art of crafting a systematic literature review in entrepreneurship research. *International Entrepreneurship and Management Journal, 16*(3), 1023–1042. https://doi.org/10.1007/s11365-020-00635-4

Kwek, M. L. (2015). Using problem posing as a formative assessment tool. In F. M. Singer, N. Ellerton, & J. Cai (Eds.), *Mathematical problem posing: From research to effective practice* (pp. 273–292). Springer. https://doi.org/10.1007/978-1-4614-6258-3_13

Lamri, J., Valentini, K., Zamana, F., & Lubart, T. (2025). Creative work as seen through the ATHENA competency model. *Behavioral Sciences*, *15*(11), 1469. https://doi.org/10.3390/bs15111469

Long, H., Kerr, B. A., Emler, T. E., & Birdnow, M. (2022). A critical review of assessments of creativity in education. *Review of Research in Education*, *46*(1), 288-323. https://doi.org/10.3102/0091732X221084326

Maher, C. A., Maher, J. A., Palius, M. F., & Wilkinson, L. C. (2023). Teachers attending to student reasoning: Do beliefs matter?. *The Journal of Mathematical Behavior*, *69*, 101050. https://doi.org/10.1016/j.jmathb.2023.101050

Mangas-Vega, A., Dantas, T., Merchán-Sánchez-Jara, J., & Gómez-Díaz, R. (2018). Systematic literature reviews in social sciences and humanities: A case study. *Journal of Information Technology Research,* *11*(1), 1–17. https://doi.org/10.4018/JITR.2018010101

Marrone, R., Cropley, D. H., & Wang, Z. (2023). Automatic assessment of mathematical creativity using natural language processing. *Creativity Research Journal*, *35*(4), 661-676. https://doi.org/10.1080/10400419.2022.2131209

Mulawarman, A. V. (2024). Evaluation of digital project based blended learning model to improve students' critical thinking and problem solving skills. *Journal of Ecohumanism*, *3*(8), 1875-1895. https://doi.org/10.62754/joe.v3i8.4847

Omar, M., Karakok, G., Savic, M., Turkey, H. E., & Tang, G. (2019). I felt like a mathematician: Problems and assessment to promote creative effort. *Primus*, *29*(1), 82-102. https://doi.org/10.1080/10511970.2018.1475435

Pang, G., Cox, R. C., & Acheson, K. (2023). Assessing transformative learning in international education: Critiques and new directions based on a systematic review of literature. *New Directions for Adult and Continuing Education*, *2023*(177), 75-89. https://doi.org/10.1002/ace.20480

Polya, G. (1945). *How to solve it: A new aspect of mathematical method*. Princeton University Press.

Rafi, I., & Retnawati, H. (2022). Exploring the use of portfolio assessment in fostering students mathematical creativity and self-regulated learning in an era of uncertainty. *AIP Conference Proceedings,* *2575*(1), 040016, https://doi.org/10.1063/5.0111225

Rahayuningsih, S., Sirajuddin, S., & Ikram, M. (2021). Using open-ended problem-solving tests to identify students' mathematical creative thinking ability. *Participatory Educational Research,* *8*(3), 285–299. https://doi.org/10.17275/per.21.66.8.3

Razak, A. A., Ramdan, M. R., Mahjom, N., Zabit, M. N. M., Muhammad, F., Hussin, M. Y. M., & Abdullah, N. L. (2022). Improving critical thinking skills in teaching through problem-based learning for students: A scoping review. *International Journal of Learning, Teaching and Educational Research*, *21*(2), 342-362. https://doi.org/10.26803/ijlter.21.2.19

Sadak, M., Incikabi, L., Ulusoy, F., & Pektas, M. (2022). Investigating mathematical creativity through the connection between creative abilities in problem posing and problem solving. *Thinking Skills and Creativity*, *45*, 101108. https://doi.org/10.1016/j.tsc.2022.101108

Sak, U., Ayvaz, Ü., Bal-Sezerel, B., & Özdemir, N. N. (2017). Creativity in the domain of mathematics. In J. C. Kaufman, V. P. Glăveanu, & J. Baer (Eds.), *The Cambridge handbook of creativity across domains* (pp. 276–298). Cambridge University Press. https://doi.org/10.1017/9781316274385.016

Singer, F. M., Voica, C., & Pelczer, I. (2017). Cognitive styles in posing geometry problems: Implications for assessment of mathematical creativity. *ZDM Mathematics Education*, *49*(1), 37–52. https://doi.org/10.1007/s11858-016-0820-x

Tall, D. (2014). Making sense of mathematical reasoning and proof. In Y. Li, & G. Lappan (Eds.), *Mathematics curriculum in school education* (pp. 223–235). Springer.

Tan, M., Mourgues, C., Bolden, D. S., & Grigorenko, E. L. (2014). Making numbers come to life: Two scoring methods for creativity in Aurora's Cartoon Numbers. *The Journal of Creative Behavior*, *48*(1), 25-43. https://doi.org/10.1002/jocb.39

Verger, N. B., Roberts, J., Guiller, J., & McAloney-Kocaman, K. (2024). Creativity research overlooks the study of resilience among young children: A bibliometric network review. *The Journal of Creative Behavior*, *58*(1), 96-113. https://doi.org/10.1002/jocb.632

Wen, S. F., Shukla, A., & Katt, B. (2025). Artificial intelligence for system security assurance: A systematic literature review. *International Journal of Information Security*, *24*(1), 43. https://doi.org/10.1007/s10207-024-00959-0

Whittle, A., Vaara, E., & Maitlis, S. (2023). The role of language in organizational sensemaking: An integrative theoretical framework and an agenda for future research. *Journal of Management*, *49*(6), 1807-1840. https://doi.org/10.1177/01492063221147295

Xiao, Y., & Watson, M. (2019). Guidance on conducting a systematic literature review. *Journal of Planning Education and Research*, *39*(1), 93–112. https://doi.org/10.1177/0739456X17723971

Yang, B. (2023). From STEM to STEAM: The connections and fostering of creativity in STEAM. *Lecture Notes in Education Psychology and Public Media, 2*(1), 441–446.

Yasemin, S., & Kadir, B. A. (2025). Mathematical creativity: A systematic review of definitions, frameworks, and assessment practices. *Education Sciences*, *15*(10), 1348. https://doi.org/10.3390/educsci15101348

Ying, H., Wu, Z., Geng, Y., Wang, J., Lin, D., & Chen, K. (2024). Lean workbook: A large-scale lean problem set formalized from natural language math problems. *Advances* *in Neural Information Processing Systems*, *37*, 105848-105863. https://doi.org/10.52202/079017-3357

Zainudin, M., Subali, B., & Jailani. (2019). Construct validity of mathematical creativity instrument: First-order and second-order confirmatory factor analysis. *International Journal of Instruction, 12*(3), 595–614. https://doi.org/10.29333/iji.2019.12336a

***Nadya Dewinda Agustin (Corresponding Author)**
Faculty of Education, Universitas Negeri Jakarta
Jl. Rawamangun Muka, Rawamangun, Pulo Gadung, East Jakarta, 13320
Email: nadyadewindaa@gmail.com

Mohammad Syarif Sumantri
Faculty of Education, Universitas Negeri Jakarta
Jl. Rawamangun Muka, Rawamangun, Pulo Gadung, East Jakarta, 13320
Email: syarifsumantri@unj.ac.id

Arita Marini
Faculty of Education, Universitas Negeri Jakarta
Jl. Rawamangun Muka, Rawamangun, Pulo Gadung, East Jakarta, 13320
Email: aritamarini@unj.ac.id