

**PROSES BERPIKIR KREATIF MATEMATIS SISWA BERBAKAT
(*GIFTED STUDENTS*) DALAM MENYELESAIKAN
MASALAH *OPEN-ENDED***

TESIS

Diajukan untuk memenuhi sebagian dari syarat untuk memperoleh gelar
Magister Pendidikan Matematika



oleh

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**PROGRAM STUDI PENDIDIKAN MATEMATIKA
SEKOLAH PASCASARJANA
UNIVERSITAS PENDIDIKAN INDONESIA
BANDUNG
2019**

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HALAMAN PENGESAHAN

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ABSTRAK

Nursyam Anaguna (2019). Proses Berpikir Kreatif Matematis Siswa Berbakat (*Gifted Students*) dalam Menyelesaikan Masalah *Open-ended*

Perpaduan antara kreativitas dan bakat matematis yang dimiliki oleh siswa berbakat dapat memunculkan kemampuan berpikir kreatif matematis yang berperan penting dalam menyelesaikan masalah matematis. Penelitian ini bertujuan untuk melihat bagaimana kecenderungan proses berpikir kreatif matematis siswa berbakat dalam menyelesaikan masalah *open-ended* pada materi barisan dan deret. Pendekatan yang digunakan dalam penelitian ini adalah pendekatan *grounded theory*. Data dikumpulkan melalui tes dan wawancara yang dilakukan terhadap 2 orang siswa berbakat yang berumur 8-9 tahun. Hasil analisis memperlihatkan bahwa 1) siswa berbakat mampu menunjukkan kemampuan berpikir kreatif matematis dengan: meyakinkan dan menumbuhkan semangat dalam mengerjakan masalah matematika; membiasakan diri untuk membaca buku dan berlatih soal-soal matematika; menumbuhkan rasa penasaran terhadap masalah baru dan terbiasa mengajukan pertanyaan; menerima kritik dan berhati-hati dalam menyimpulkan cara maupun solusi penyelesaian masalah; berusaha menyelesaikan masalah secara mandiri dan tepat waktu; dan memperluas pengetahuan matematika dengan mengikuti serangkaian kegiatan pembinaan pengetahuan matematika, 2) indikator kemampuan berpikir kreatif yang muncul pada saat siswa berbakat menyelesaikan masalah matematika adalah indikator kelancaran, kelenturan, elaborasi, dan integrasi, dan 3) faktor pendukung kemampuan berpikir kreatif matematis adalah keyakinan dan semangat dalam menyelesaikan masalah, serta dukungan dari guru dan orang tua, sementara itu, faktor penghambat kemampuan berpikir kreatif matematis adalah kurangnya perhatian guru dan orang tua terhadap perkembangan bakat matematis yang dimiliki oleh siswa berbakat. Hasil analisis dari penelitian dapat dijadikan sebagai bahan pertimbangan untuk guru dan orang tua agar senantiasa mengasah kemampuan berpikir kreatif matematis siswa berbakat sejak dini.

Kata Kunci: Kemampuan berpikir kreatif matematis, siswa berbakat, masalah *open-ended*, dan *grounded theory*.

ABSTRACT

Nursyam Anaguna (2019). Process of Gifted Students Mathematical Creative Thinking in Solving Open-ended Problems.

The combination of creativity and mathematical talent possessed by gifted students can lead to mathematical creative thinking skills that play an important role in solving mathematical problems. This study aims to see how the tendency of mathematical creative thinking processes of gifted students in solving open-ended problems in sequences and series subject. The approach used in this study is a grounded theory. Data was collected through tests and interviews conducted on 2 gifted students aged 8-9 years. The results of the analysis show that 1) gifted students are able to demonstrate mathematical creative thinking skills by: convincing and fostering enthusiasm in working on mathematical problems; get used to reading books and practicing math questions; foster curiosity about new problems and get used to asking questions; accept criticism and be careful in concluding ways and solutions to problem solving; trying to solve problems independently and on time; and expanding mathematical knowledge by following a series of mathematical knowledge coaching activities, 2) indicators of creative thinking skills that emerge when gifted students solve mathematical problems are indicators of fluency, flexibility, elaboration and integration, and 3) supporting factors of mathematical creative thinking abilities are beliefs and enthusiasm in solving problems, as well as support from teachers and parents, meanwhile, inhibiting factor of mathematical creative thinking abilities is the lack of attention of teachers and parents to the development of mathematical talents possessed by gifted students. The results of the analysis of the research can be used as a consideration for teachers and parents to constantly hone the mathematical creative thinking abilities of gifted students from an early age.

Keywords: Mathematical creative thinking skills, gifted students, open-ended problems, and grounded theory.

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- Adawiyah, R., Muin, A., & Khairunnisa, K. (2017). Mathematical Inductive-Creative Reasoning , A Theoretical Study. *Advances in Social Science, Education and Humanities Research (ASSEHR)*, 57, 247–251.
- Anaguna, N., Suhendra, & Rahmadani. (2019). Tracking down gifted students ' creative thinking in solving mathematics problems. *Journal of Physics: Conference Series*, 1211(1), 012059.
- Arends, R. (2008). *Learning to Teach*. Penerjemah: Helly Prajitno & Sri Mulyani.
- Ardeniyansyah, & Rosnawati. (2018). Implementation of Problem-Based Learning in terms of Student Mathematical Creative Thinking. *Journal of Physics: Conferences Series*, 1097, 1–5.
- Arifin, Z. (2017). Mengembangkan Instrumen Pengukur Critical Thinking Skills Siswa pada Pembelajaran Matematika Abad 21. *Jurnal THEOREMS (The Original Research of Mathematics)*, 1(2), 92–100.
- Cetinkaya, C. (2014). The effect of gifted students ' creative problem solving program on creative thinking. *Procedia - Social and Behavioral Sciences*, 116(2014), 3722–3726.
- Chamberlin, S. A., & Moon, S. M. (2005). Model-Eliciting Activities as a Tool to Develop and Identify Creatively Gifted Mathematicians. *The Journal of Secondary Gifted Education*, XVII(1), 37–47.
- Chiu, M. (2009). Approaches to the Teaching of Creative and Non-Creative Mathematical Problems. *International Journal of Science and Mathematics Education*, 7(1), 55–79.
- Corbin, J., & Strauss, A. (1990). Grounded Theory Research: Procedures , Canons , and Evaluative Criteria. *Qualitative Sociology*, 13(1), 3–21.
- Creswell, J. W., Hanson, W. E., & Clark, V. L. P. (2007). Qualitative Research Designs : Selection and Implementation. *The Counseling Psychologist*, 35(2), 236–264.
- Davis, G. A., Rimm, S. B., & Siegle, D. (1985). *Education of the Gifted and Talented*. (J. W. Johnston, Ed.) (7th ed.). Pearson Education.
- Departemen Pendidikan Nasional, P. B. (2008). *Kamus Bahasa Indonesia*. Jakarta.
- Fardah, D. K. (2012). Analisis Proses dan Kemampuan Berpikir Kreatif Siswa dalam Matematika Melalui Tugas Open-Ended. *Jurnal Kreano*, 3(2).

- Gagné, F. (2004). Transforming gifts into talents : the DMGT as a developmental theory. *High Ability Studies*, 15(2), 119–147.
- Gross, M. U. . (2004). *Gifted and Talented Education Professional Development Package for Teachers*. (S. Bailey, Ed.) (Module 1). Sydney: The University of South Wales.
- Guldemon, H., Bosker, R., Kuyper, H., & Greetje van der Werf. (2007). Do Highly Gifted Students Really Have Problems? *Educational Research and Evaluation*, 13(6), 555–568.
- Harrison, C. (2003). Giftedness in Early Childhood: The Search for Complexity and Connection. *Roeper Review*, 26(2), 78–84.
- Haylock, D. W. (1987). A Framework for Assessing Mathematical Creativity in Schoolchildren. *Educational Studies in Mathematics*, 18(1987), 59–74.
- Haylock, D. (1997). Recognizing Mathematical Ability in Schoolchildren. *ZDM Mathematics Education*, 29(3), 68–94.
- Hendriana, H., Rohaeti, E. E., & Sumarmo, U. (2017). *Hard Skills and Soft Skills Matematik Siswa*. (P. R. Aditama, Ed.). Bandung.
- Hobri, H., Suharto, S., & Naja, A. R. (2018). Analysis of Students ' Creative Thinking Level in Problem Solving Based on National Council of Teachers of Mathematics. *Journal of Physics*, 1008(1), 012065.
- Kau, M. A. (2017). Peran Guru dalam Mengembangkan Kreativitas Anak Sekolah Dasar. *Proceeding Seminar Dan Lokakarya Nasional Revitalisasi Laboratorium Dan Jurnal Ilmiah Dalam Implementasi Kurikulum Bimbingan Dan Konseling*, 157–166.
- Krutetskii. (1986). Visualisation and Mathematical Giftedness. *Educational Studies in Mathematics*, 17, 297–311.
- Kuncorowati, R. H., Mardiyana, & Saputro, D. R. S. (2017). Mathematics Creative Thinking Levels Based on Interpersonal Intelligence. *Journal of Physics: Conference Series*, 943, 1–7.
- Kwon, O. N., Park, J. S., & Park, J. H. (2006). Cultivating Divergent Thinking in Mathematics through an Open-Ended Approach. In C. Kim (Ed.), *Asian Pasific Education Review* (Vol. 7, pp. 51–61). Springer Netherlands.
- Mann, E. L. (2006). Creativity : The Essence of Mathematics. *Journal for the Education of the Gifted*, 30(2), 236–260.
- Mardhiyana, D., & Wahani, E. O. S. (2016). Mengembangkan Kemampuan Berpikir Kreatif dan Rasa Ingin Tahu Melalui Model Pembelajaran Berbasis

- Masalah. In *PRISMA, Prosiding Seminar Nasional Matematika*, 672–688.
- Moma, L. (2015). Pengembangan Instrumen Kemampuan Berpikir Kreatif Matematis Untuk Siswa SMP. *Jurnal Matematika Dan Pendidikan Matematika*, 4(1), 27–41.
- Nasriadi, A. (2016). Berpikir reflektif siswa smp dalam memecahkan masalah matematika ditinjau dari perbedaan gaya kognitif. *Numeracy Journal*, III(April), 15–26.
- Noer, S. H. (2011). Kemampuan Berpikir Kreatif Matematis dan Pembelajaran Matematika Berbasis Masalah Open-ended. *Jurnal Pendidikan Matematika*, 5(1).
- Nohda, N. (2000). Teaching by Open-Approach Method in Japanese Mathematics Classroom. *Proceeding of the 24th Conference of the International Group for the Osychology of Mathematics Education*, 1(July), 39–53.
- Nurdyanti, F., Slamet, I., & Sujadi, I. (2018). Creative Thinking Level of Students With High Capability in Relations and Functions By Problem- based Learning. *Journal of Physics*, 983(1), 012102.
- Permatasari, H. R., & Wahyudin. (2017). Gender : Its Relation to Mathematical Creative Thinking Skill. *Journal of Physics: Conference Series*, 895(1), 012093.
- Primastasya, N. (2016). Analisis Kemampuan Berpikir Matematis Calon Guru Sekolah Dasar dalam Menyelesaikan Masalah Matematika. *Jurnal Pendidikan Matematika*, 2(2010), 50–57.
- Reiman, A. J. (1999). The Evolution of the Social Roletaking and Guided Reflection Framework in Teacher Education: Recent Theory and Quantitative Synthesis of Research. *Teaching and Teacher Education*, 15, 579–612.
- Renzulli, J. S. (2002). Emerging Conceptions of Giftedness : Building a Bridge to the New Century. *Exceptionality: A Special Education Journal*, 10(2), 67–75.
- Renzulli, J. S. (2012). Reexamining the Role of Gifted Education and Talent Development for the 21st Century: A Four-Part Theoretical Approach. *Gifted Child Quarterly*, 56(3), 150–159.
- Rochmat, Agoestanto, & Kharis, M. (2018). Characteristic of Critical and Creative Thinking of Students of Mathematics Education Study Program. *Journal of Physics: Conference Series*, 983, 0–4.
- Shavinina, L. V. (2013). *The Routledge International Handbook of Innovation*

Education (1st edn). Abingdon: Routledge.

- Siswono, T. Y. E. (2005). Upaya Meningkatkan Kemampuan Berpikir Kreatif Siswa Melalui Pengajuan Masalah. *Jurnal Pendidikan Matematika Dan Sains*, 10(1), 1–15.
- Sriraman, B. (2003). Mathematical Giftedness, Problem Solving, and the Ability to Formulate Generalizations: The Problem-Solving Experiences of Four Gifted Students. *The Journal of Secondary Gifted Education*, XIV(3), 151–165.
- Sriraman, B. (2005). Are Giftedness and Creativity Synonyms in Mathematics? *The Journal of Secondary Gifted Education*, XVII(1), 20–36.
- Stacey, K. (2010). *Thinking Mathematically: Second Edition*. Pearson Education.
- Supardi. (2012). Peran Berpikir Kreatif dalam Proses Pembelajaran Matematika. *Jurnal Formatif*, 2(3), 248–262.
- Tohir, M., Abidin, S., Dafik, D., & Hobri, H. (2018). Students Creative Thinking Skills in Solving Two Dimensional Arithmetic Series Through Research-based Learning. *Journal of Physics*, 1008(1), 012072.
- Wang, A. Y. (2012). Exploring the relationship of creative thinking to reading and writing. *Thinking Skills and Creativity*, 7(1), 38–47.
- Wardani, S., Sumarmo, U., & Nishitani, G. (2011). Mathematical Creativity and Disposition: Experiment with Grade-10 Students Using Silver Inquiry Approach. *Journal for Science and Mathematics Teaching, GUNMA University*, 59, 1–16.
- Widayanti, F. D. (2013). Pentingnya Mengetahui Gaya Belajar Siswa dalam Kegiatan Pembelajaran di Kelas. *Erudio Journal of Educational Innovation*, 2(1), 8–21.
- Wijaya, E. Y., Sudjimat, D. A., & Nyoto, A. (2016). Transformasi Pendidikan Abad 21 sebagai Tuntutan Pengembangan Sumber Daya Manusia di Era Global. *Prosiding Seminar Nasional Pendidikan Matematika*, 1, 263–278.
- Williams, G. (2002). Identifying Tasks that Promote Creative Thinking in Mathematics: A Tool. In *The Mathematical Education Research Group of Australasia Conference* (pp. 698–705).
- Yaftian, N. (2015). The Outlook of the Mathematicians' Creative Processes. *Procedia - Social and Behavioral Sciences*, 191, 2519–2525.