

Editorial of the 2023 Summer issue 47, Vol 15 No 3

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Which season is your country in right now? Summer or dry season. No matter what season you are currently going through, we can enjoy it together by reading a special issue in **Volume 15 Number 3**. It is my pleasure and pride to present ten articles from Indonesia as a part of MTRJ Mission in teaching-research and learning mathematics. Mathematics education in Indonesia cannot be separated from the historical journey of the curriculum, which can be grouped into four periods, namely traditional mathematics learning (before 1975), modern mathematics learning (1975 curriculum), current mathematics learning (1984 curriculum to 2013 curriculum), and Merdeka curriculum that regards mathematics as a mental activity. The Indonesian Ministry of Education implemented the Merdeka Curriculum in February 2022. The reason for the change in the curriculum is the results of the **Programme for International Student Assessment (PISA)** in recent years, which showed that 70% of 15-year-old students do not meet the minimum competency level in basic reading comprehension and the application of basic mathematical concepts. Therefore, the Merdeka curriculum places a strong emphasis on problem-solving skills as a one of fundamental objectives of mathematics education. In addition, the curriculum offers comprehensive support to schools, aiming to enhance the professionalism of educators themselves. It is essential for a wide spectrum of stakeholders to embrace the Merdeka Curriculum—this includes not only teachers, schools, and students, but also researchers, parents, and the learning community. To address the challenges in Indonesian mathematics education, this volume is divided into two learning themes within the overarching theme of ‘problem solving’: prospective mathematics teachers and students.

Prospective teachers are featured in the first four articles, each addressing different problems. Using Didactical Design Research (DDR) with title “**The Effectiveness of Didactic Designs for Solutions to Learning-Obstacle Problems for Prospective Mathematics Teacher Students: Case Studies on Higher-Level Derivative Concepts**”, Entit Puspita, et al, highlights the importance of addressing learning obstacles in mathematics education and suggests that the developed didactic design can contribute to improving the quality of learning in high-level derivative topics. The next research is motivated by low mathematics achievements of Indonesian students, attributed to conventional learning models. Using the Outdoor Learning Mathematics Project (OLMP) prospective teachers were actively engaged in diverse activities, enabling them to explore numerous mathematical concepts and apply them effectively to complete the project.

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Another team, Didik Sugeng Pambudi, et al, conducted research under the title “**The Mathematics Prospective Teachers Activities When Solving Outdoor Learning Mathematics Projects in the Campus Garden**”.

Continuing in the context of prospective teachers’ problem-solving abilities in the title “**Prospective Teachers’ Perspectives on Collaborative Problem Solving in Mathematics**” Fatmanisa, et al, conducted interviews with participants who had different perspectives toward creative problem solving. Despite having some similarities in their views on perseverance and interest in collaboration, there are noticeable distinctions in their attitudes towards openness to problems and the value of teamwork. Let your journey about pre-service teachers end with a newfound arising from the fruitful collaboration between Indonesian and Malaysian researchers. Yanuarto, et al, in their paper “**The Moderating Model of Teaching Anxiety on Teaching Beliefs and TPACK Effect to ICT Literacy Among Pre-Service Mathematics Teachers**” has resulted in a study using Structural Equation Modeling (SEM) to examine the relationships between teaching anxiety, teaching beliefs, and pre-services mathematics teacher’s ability to integrate technology into education.

On the other hand, the process of learning mathematics typically takes place in a classroom environment, where students engage with mathematical content. This volume consists of six results regarding student activities in Indonesian mathematics learning. It begins with students' difficulties in understanding algebraic notation, particularly the interpretation of letters in algebra, are the focus of the paper titled “**Is ‘Fruit Salad Algebra’: Still a Favorite Menu in Introducing Algebra in Schools?**” by Lia Ardiansari and colleagues. In addition to algebraic content, Muslim et al, in the paper entitle “**Student Commognitive Analysis in Solving Algebraic Problems**” describe student cognition based on open-ended algebraic problem-solving. As we know, commognitive is a combination of communication and cognition. Recommendations for further research can be obtained from Kadir's article entitled “**Students’ Mathematics Achievement Based on Performance Assessment through Problem Solving-Posing and Metacognition Level**”. Through a comprehensive study and supported by complete statistical data, Kadir's suggests that teachers should adopt a teaching style that includes a diverse set of questions during problem-solving and problem-posing tasks. Through case study method, Safarini et al, in their paper “**Students’ Proceptual Thinking Outcomes in Learning Differentiability Using Desmos Classroom Activities Based on The Three Worlds of Mathematics Framework**”, analyze the conceptual thinking results of 25 students as they answer problems related to the differentiability.

The given problem is challenging: “show that $f(x) = \begin{cases} x, & x \leq 1 \\ x^2, & x > 1 \end{cases}$ is continues but NOT differentiable at $x=1$ ”. Another practical problem solving is demonstrated by Ivan Retamoso as **The Problem Corner Editor**. This section presents innovative solutions and challenges to address current issues in the field, offering fresh perspectives on tackling complex problems.

Towards the end of the page, the analysis using Mathematical Understanding Layers revealed original solutions in the students' problem-solving activities. Octavina Rizky Utami Putri, et al, nicely presented it in the article "**Problem-solving: Growth of Students' Students' Mathematical Understanding in Producing Original Solutions**". The issues closed with a study on problem solving by Kamariah, a woman from the easternmost region of Indonesia, Papua. Through an article entitled "**Exploring Students' Work in Solving Mathematics Problem through Problem-Solving Phases**", it is shown that students' onto-semiotics in solving combinatoric problems provide insight into the variations in the formation of the use of mathematical objects in each problem-solving phase.

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