Research Trends in Mathematics Education in the Jurnal Pendikan Matematika (JPM) 2021-2022

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Abstract

Accredited national journals have been accredited at a Sinta 2 rating which are increasingly being used to publish research results in the field of mathematics education and continue to experience improvements and developments from time to time. This research was conducted to provide an overview of the direction of research in the field of mathematics education which was published in Jurnal Pendidikan Matematika (JPM) and to identify opportunities for mathematics education research that could be carried out in the future. This type of research is a scoping literature review using the Arksey & O'Malley framework with five stages. A review was conducted of mathematics education journals (JPM) articles in the field of mathematics education published in Jurnal Pendidikan Matematika (JPM) in 2021-2022. From the results of this study, it was found that the current trending topic in the Jurnal Pendidikan Matematika (JPM) is PISA, the dominating research methods are qualitative research and development research. Furthermore, the sample variations that were studied were junior high school students. Researchers provide recommendations to expand the topic regarding PISA questions and effective learning such as FIipped Classroom as the use of technology.

Keywords: *Research Trends; JPM; Mathematics Education.*

Abstrak

Jurnal nasional terakreditasi telah terakreditasi pada peringkat Sinta 2 yang semakin banyak digunakan untuk mempublikasikan hasil penelitian dalam bidang pendidikan matematika dan terus mengalami peningkatan dan perkembangan dari waktu ke waktu. Penelitian ini dilakukan bertujuan untuk memberikan gambaran tentang arah penelitian dalam bidang pendidikan matematika yang dipublikasikan dalam Jurnal Pendidikan Matematika (JPM) serta untuk mengidentifikasi kesempatan penelitian pendidikan matematika yang dapat dilakukan di masa yang akan datang. Jenis penelitian ini adalah scoping literature review menggunakan kerangka kerja Arksey & O'Malley dengan lima tahapan. Tinjauan dilakukan terhadap jurnal pendidikan matematika (JPM) artikel bidang pendidikan matematika yang dipublikasikan di jurnal pendidikan matematika (JPM) pada tahun 2021-2022. Dari hasil penelitian ini, ditemukan bahwa topik yang sedang tren dalam Jurnal Pendidikan Matematika (JPM) saat ini adalah PISA, metode penelitian yang mendominasi adalah penelitian kualitatif dan penelitian pengembangan. Selanjutnya variasi sampel yang banyak di teliti adalah siswa SMP. Peneliti

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memberi rekomendasi memperluas topik mengenai soal PISA dan pemebajaran Afektif seperti FIipped Classroom sebagai pemanfaatan teknologi.

Kata Kunci: Trend Penelitian; JPM; Pendidikan Matematika.

INTRODUCTION

Research in the field of mathematics education has a significant role in improving the quality of learning mathematics. Research groups consisting of lecturers, teachers, students, and other practitioners who care about developing the quality of their mathematics education play an important role in answering problems in this field (Salasiyah, 2019). To solve the problems and challenges of learning mathematics, it is very important to increase the number of mathematics education research conducted by lecturers and students. Apart from that, this can also contribute to the development of mathematics education and learning by producing new efforts and breakthroughs (PeranginAngin et al., 2021).

With the increase in the number of mathematics education journals in recent years, there has been a significant increase in the number of publications published in various sub-fields of mathematics education (Julius et al., 2021). For students' research skills to develop properly, various efforts are needed to provide clear direction in the development process. Many research themes can be researched in the field of mathematics education. To reduce the tendency for duplication of research, efforts should be made to increase understanding of various themes and research methods. In addition, it is necessary to improve the quality of learning in mathematics education study programs to facilitate students in improving their mathematical abilities. By improving the quality of learning, it is expected to improve the quality of study programs (Frentika et al., 2020).

To increase the quantity and quality of research in Indonesia, it is necessary to develop scientific publication media, such as high-quality scientific journals. It is intended that research articles are not only published in international journals but also disseminated in journals published in Indonesia (Saputro, 2019). The higher the accreditation of the journal, the better the quality of the published articles. Improving the quality and quantity of journals that have national accreditation and international reputation is important for achieving the goal of

higher education becoming a research university, as well as a media for dissemination for the downstream process of research results according to directions from the Ministry of Education, Culture, Research and Technology (Fathani, 2022).

The Journal of Mathematics Education (JPM) as a trend in mathematics education research in the Sinta 2 journal is a reference for lecturers and students in research. Topics/issues in research in 2021 and 2022 can be used as references for further research. One way to improve quality and give meaning to mathematics education is through research activities. The results of mathematics education research can add value to effective content, strategies, methods, and evaluation techniques for learning mathematics. Implementation of research results in class can improve the quality of learning mathematics, and in the end, can improve the overall quality of mathematics education (Murtiyasa, 2016).

Based on the explanation above, the focus of this research is to gather information and examine the results of research in the Journal of Mathematics Education (JPM) which will be published in 2021 and 2022. This research has been researched by previous studies such as (PeranginAngin et al., 2021) research on Direction and Research Trends in Mathematics Education in the Mathematics Education Research Journal (JRPM), (Sudarsono, 2019) research on Mathematics Learning Research Trends "Analysis of Science, Technology, Engineering, and Mathematics (STEM) Journals", (Murtiyasa, 2016) research on Issues Key Issues and Trends in Mathematics Education Research.

Mathematics education research is currently developing rapidly, this can be seen from the many mathematics education research organizations such as the European Mathematical Society (EMS), International Mathematical Union (IMU), International Society for Mathematical Sciences, International Group for Psychological Mathematics Education (IGPME), European Researchers of Mathematics Education (ERME), and so on (PeranginAngin et al., 2021) This research has criteria for articles that will be used as research, namely mathematics education research articles published by the Mathematics Education Journal

(JPM) in 2021/2022. From the articles that have been reviewed, there are variations on topics, issues that arise, subject variations, and recommendations.

Therefore this study aims to obtain an overview of the direction and trends of mathematics education research published in mathematics education journals (JPM) and to identify future opportunities for mathematics education research. This article is expected to be a reference for researchers who will carry out research in the field of mathematics education to obtain an overview of current research trends. The researcher chose the research topic "Mathematics Education Research Trends in the Mathematics Education Journal (JPM) for 2021-2022".

RESEARCH METHODS

This research uses a literature review scoping approach to identify research trends. The scoping review research design was chosen because the reference sources used came from various journal articles. Scoping the literature review uses a five-stage framework formulated by Arksey & O'Malley (Utami et al., 2021) namely identifying research questions, identifying relevant research, selecting literature, mapping data, and compiling, summarizing, and reporting results.

This research is a scoping literature review to identify research trends and formulate a future research agenda (Tricco et al., 2016). Scoping the literature review uses a five-stage framework formulated by Arksey & O'Malley 2005 (Utami et al., 2021), namely identifying research questions, identifying relevant research, selecting literature, hiding data, and compiling, summarizing, and reporting results. The implementation of this research also pays attention to the scoping literature review recommendations found by (Levac, D., Colquhoun & O'Brien, 2010) O'Brien, 2010), namely clarifying and connecting research objectives and questions (stage one); balancing feasibility with breadth and completion of the scoping process (stage two); using an iterative team approach for selecting studies (stage three) and data purification (stage four); incorporating numerical constructs and qualitative thematic analyses, reporting results, and considering actual study findings against policy, practice, or research (stage five);

and incorporating stakeholder consultation as a component of knowledge translation required in the scoping study methodology (stage six).

This research formulates 4 questions regarding what year was this publication published. Second, what method was used in the research? Third, what subject variations were used in the study? Fourth, what recommendations are given? There are several categories of articles published in mathematics education journals (JPM), as in 2021 there were 16 published articles. By 2022, there will be 24 articles published in the JPM journal. From these articles, the researcher will review as many as 40 articles published in 2021 and 2022, but these 40 articles are adjusted to the article criteria used, namely articles that have similar research and are analyzed and summarized about research issues, methods, subjects, and research recommendations so that the data is used as a complete discussion in this article.

RESULTS AND DISCUSSION

A. Research Topics in Mathematics Education

Mathematics education research in (2021-2022) is based on the Jurnal Pendidikan Matematika (JPM) Sriwijaya University, Palembang, Indonesia. There are several dominant topics studied which have been summarized in Table 1. Several researchers such as (Mariani et al., 2022), (Agustina & Zulkardi, 2021), (Turidho et al., 2021), (Sistyawati et al., 2022), (Saputri et al., 2022) examines uncertain integrals, algebra, functions, fractions, integers, arithmetic sequences, geometric transformations, prisms to statistics. The material used dominates the material used by experts to discuss PISA questions.

The topic of research carried out by discussing media/technology is studying e-learning on algebra material, video media on linear algebra material, e-modules, and video conversions on fraction material. Research topics regarding media/technology are discussed by (Rahmawati & Soekarta, 2021), (Astari et al., 2021), (Agustina & Zulkardi, 2021). Several studies have discussed affective learning such as having examined learning difficulties, anxiety & independent learning, learning outcomes, to the disposition of the core learning model. This

research was carried out by (Febriyanti et al., 2021), (Delima & Cahyawati, 2021), (Meryansumayeka et al., 2021), (Supianti et al., 2022), (Abbas et al., 2022). Research categories are made in tabular form such as research topics, methods, sample variations, and recommendations as follows:

Table 1. Research Topics Journal of Mathematics Education (JPM)
Years 2021-2022

No	Research Topic	Number of Articles		Total
		2021	2022	
1.	Afektif	3	2	5
2.	PISA	2	5	7
3.	Mathematical Literacy	1	2	3
4.	RME	1	3	4
5.	Kognitif	1	3	4
6.	Media/Technology	3	3	6
7.	Covid 19	0	3	3

From Table 1, what has been widely researched is about PISA. Thus the researcher uses materials such as integrals, algebra, and the functions discussed to improve students' cognitive abilities in the form of mathematical literacy, and reasoning abilities so that they can change Indonesian PISA literacy to improve. Mathematical abilities must be possessed by students aiming to improve students' mathematical skills (Asdamayanti et al., 2023) Furthermore, the media/technology that has become a trending research topic has seen many developments in the digital era carried out by Indonesia, including the mass media in Indonesia, which have changed in conveying information. Online media (internet) in this era has replaced conventional mass media. Even though Indonesia is almost a decade late in adopting communication technology, especially the internet. However, the digital culture of the Indonesian people is very fast in accepting these technological developments. Viewed globally, Indonesia is included in the digital culture that is needed to achieve positive growth through the progress of the era itself (Setiawan, 2017).

The next thing that dominates the topic of mathematics research is affective learning, which is an aspect of attitude that is embedded in students so

that attitudes cannot be separated from values (Kadir, 2015). Then followed by RME and Cognitive learning. Furthermore, what is rarely studied is mathematical literacy and Covid 19. Mathematical literacy in students must be supported by a good learning atmosphere. A teacher should be able to create a learning atmosphere that allows students to actively learn by constructing, discovering, and developing their knowledge. Next, the Covid-19 pandemic has changed the face of education in Indonesia, changing learning activities that are usually carried out in face-to-face classes to distance learning (PJJ) or online, now learning is active in class (Fitri et al., 2021).

B. Mathematics Education Research Methods

Based on Table 2, the dominating method is the qualitative and developmental approach. This research is important to discover new things and improve product quality so that it can meet user needs properly. It can be seen in Table 2 for the elaboration of the dominant research methods studied.

Table 2. Mathematics Education Journal (JPM) Method for 2021-2022

No	Method	Number of Articles		Total
		2021	2022	
1.	Qualitative Approach	7	10	17
2.	Quantitative Approach	2	4	6
3.	Expansion	7	10	17

In Table 2 it can be seen that the qualitative and development approaches dominate the research methods in the Journal of Mathematics Education (JPM). Such as qualitative method research used by (Budiarto et al., 2021), (Febriyanti et al., 2021), (Lestari et al., 2018), etc. Furthermore, development research was used by (Susanta & Sumardi, 2022), (Nova et al., 2022), (Sistyawati et al., 2022), (Wathani et al., 2022), etc.

Mathematical research often focuses on proving theorems, developing new methods, or discovering mathematical structures. This approach tends to prioritize the accuracy and clarity of mathematical concepts and the consistent use of logic. However, that does not mean that qualitative research and development does not have a role in mathematics research. There are several examples of qualitative

research in mathematics involving qualitative analysis of evidence or methods, as well as conceptual exploration to understand students' mathematical understanding or problem-solving strategies (Sohilait, 2020).

C. Mathematics Education Research Subjects

Based on research subjects that have been widely studied in junior high schools and equivalent. It can be seen in Table 3 that many research subjects were studied by students. Research on students ranging from elementary, junior high, and high school. Furthermore, much research was examined on teachers in line with the opinion (Budiarto et al., 2021) research carried out by teachers to define teaching techniques by teachers so that they could make learning interesting then 6 research students wrote articles. Then farmers and lecturers were examined by 1 article.

Table 3. Research Subjects of Mathematics Education Journal (JPM)

2021-2022

No	Research Subject	Number of Articles		Total
		2021	2022	
1.	Teacher	2	1	3
2.	Elementary students	0	2	2
3.	Junior High School Student	6	14	20
4.	High school student	2	3	5
5.	College Student	4	3	7
6.	Farmer	1	0	1
7.	Lecturer	2	0	2

From Table 4 it can be seen that the mathematics education research in the last two years has been dominated by junior high school students. School welfare is needed considering that schools have a great influence on adolescent development. Students spend most of their time, five or six days each week at school, but also in the context of fulfilling achievements and developing potential, physical, and mental abilities of students (Yuniawati & Tarnoto, 2019).

D. Recommendations for Mathematics Education Research

Furthermore, research recommendations according to (Febriyanti et al., 2021) need additional research to examine teacher knowledge about student learning difficulties in Mathematics and what solutions can be offered to overcome them. This is in line with research (Yuniawati & Tarnoto, 2019) that teachers' misunderstandings in teaching mathematics in class also need to be considered, based on field observations there are still some teachers who encourage their students to memorize the mathematical formulas given so that their students can forget the formulas. the formula quickly. Coupled with current technological advances students tend to look for answers on the internet when they get questions related to mathematics, both about formulas, how to solve them and answers to questions given by the teacher. This makes the teacher experience difficulties in explaining material that is a little more difficult.

Next, there are recommendations for considering a larger sample size study. In line with the opinion however (Abadi, 2006), a good sample is not easy to obtain considering there are still many obstacles such as limited research costs and time as well as sampling errors that the researcher is not aware of.

CONCLUSION

The results of this study showed that the current trending topic in the Journal of Mathematics Education (JPM) is PISA learning, the dominating research method is qualitative research and development. Furthermore, the sample variations that were studied were junior high school students. Then the recommendations submitted by the researcher extended the sample used and there should be additional research to find out the teacher's abilities. Researchers provide recommendations to expand the topic regarding PISA questions and effective learning such as FIipped Classroom as the use of technology.

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