

21st Century Mathematics Learning Challenges: Bibliometric Analysis of Trends and Best Practices in Shinta Indexed Scientific Publications

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Abstrak:

Penelitian ini bertujuan untuk mengetahui isu-isu atau permasalahan yang menjadi arah dan tren penelitian pendidikan matematika sebagai upaya yang dilakukan oleh guru dalam menjawab tantangan pada pembelajaran abad 21. Penulisan pada penelitian ini menggunakan studi literatur dengan memanfaatkan jurnal ilmiah yang diterbitkan oleh Jurnal Matematika Kreatif-Inovatif (KREANO) mulai tahun 2016 hingga tahun 2021 dengan melibatkan total 156 item jurnal ilmiah. Tema kajian di tahun lalu didominasi oleh proses kemampuan berpikir matematis dengan fokus ke siswa jenjang pendidikan menengah sebagai subjek penelitian. Saat ini tema penelitian pendidikan matematika mengkaji dengan fokus pada mengembangkan media atau membuat sebuah produk dan perangkat pembelajaran serta mendesain model pembelajaran berbasis proyek dengan fokus subjek ke calon guru dan siswa pendidikan ditingkat menengah sebagai subjek penelitian. Penelitian pendidikan matematika di masa depan juga akan mengkaji kemampuan berpikir matematis dengan menciptakan pembelajaran berbantu teknologi dalam lingkungan pembelajaran yang terbuka, fleksibel berbasis proyek agar siswa mampu berkolaborasi dalam mengembangkan potensinya. Oleh sebab itu guru dituntut untuk mampu untuk mengimplementasikan kurikulum untuk berinovasi dalam pembelajaran dengan berbagai pendekatan, model, strategi, metode, yang efektif.

Kata Kunci : Kecenderungan; Praktik Terbaik, topik; subjek penelitian

Abstract:

This study aims to find out the issues or problems that become the direction and trends of mathematics education research as an effort made by teachers in responding to challenges in 21st-century learning. The writing in this study uses a literature study by utilizing scientific journals published by the Creative Mathematics Journal- Innovative (KREANO) from 2016 to 2021 by involving a total of 156 scientific journal items. The theme of last year's study was dominated by the process of mathematical thinking skills with a focus on secondary education students as research subjects. Currently, the research theme of mathematics education is studying with a focus on developing media or making a product and learning device as well as designing a project-based learning model with a subject focus on prospective teachers and students of secondary education as research subjects. Future research in mathematics education will also examine mathematical thinking skills by creating technology-assisted learning in an open, flexible project-based learning environment so that students can collaborate in developing their potential. Therefore, teachers are required to be able to implement a curriculum to innovate in learning with various approaches, models, strategies, methods, assessments, and all related matters, which are effective.

Keywords : Trend; Best Practices, topics; research subject

Introduction

Currently, the industrial revolution has entered an era that demands connectivity in everything or what is known as the *internet of things* (Darmayanti et al., 2022; Zong Chen & S., 2020). This has also resulted in the development of education in the world, especially the

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subject of Mathematics (Effendi et al., 2022; WR Sah et al., 2023; Sugianto et al., 2022). Mathematics is an important subject and is found at the elementary school level to the tertiary level in education

In an effort to develop and contribute new ideas or ideas, it is necessary to research mathematics education to help solve the problems that occur in learning mathematics in education (Rizki et al., 2022; Sugianto, Darmayanti, et al., 2022; Wulandari et al., 2022). This effort can be done through evaluation or research from educational research on previous mathematics learning as carried out by (Darmayanti et al., 2022; Hung & Wang, 2021; Rahmah et al., 2022).

Evaluation in learning mathematics is needed with a purpose; 1) to get an analysis or picture related to the ability to learn; 2) to determine the level of success that has been studied; 3) To follow up on the learning outcomes achieved; 4) take responsibility for efforts in the success of the evaluation process (Darmayanti et al., 2022; Farida et al., 2019; Sekaryanti et al., 2022). The evaluation carried out by researchers in analyzing problems or issues that occurred in the past, which is happening now has become a trend for researchers (Fauza et al., 2022; Humaidi et al., 2022; Taleb & Mohamed, 2020).

Therefore, in conducting educational research research in Indonesia, this research will describe and describe a portrait of the development of trends in research that has developed and been implemented in the past and is currently happening and can find out the latest trends so that this research becomes a trend and *best practice* as an update to the research that has been done in the last six years.

The word "*trend*" itself is a method or technique used in analyzing through statistical track records based on *valid data* so that it can find out the direction and goals and trends of problems that are becoming problematic for evaluation by providing *best practice solutions* in further research (Ali et al., 2019; Bastos & Mendonça, 2016; Huang et al., 2021; Lei et al., 2021; Postma & Papp, 2020; Wang et al., 2020).

(Stewart, 2016) said that *best practice* can be seen and achieved through success in overcoming problems. According to (Castellani et al., 2018; Sugianto et al., 2022) *best practice* is the most *efficient way* to solve a problem. Next (González-María et al., 2020) *best practice* can be obtained through *trends* or issues that are currently occurring or are the most topic of study in the problems discussed by researchers in their research. Meanwhile, according to (van der Lee et al., 2021); (Palmer, 2021); (Zuriah, 2021) the most *practical, systematic, efficient and effective way based on* previously proven procedures. So it can be concluded that *trends* and *best practices* are the best way to solve a problem through steps or procedures that can be repeated and proven accurate so that they become a solution. practical and efficient.

Researchers describe it by paying attention to and analyzing educational research in the past, namely in 2016 to 2017, then in 2018 to 2019, as well as the *trend* of problems that continue to develop until now from 2020 to 2021, then the results of the analysis in this study will become a trend. and *best practice 2022* research on future mathematics education.

Methods

The method used is a literature study. The purpose of this study is to find out the direction and goals that are *trends* in past and current research problems as well as efficient and practical solutions so that they become the best solutions for other researchers for future research in mathematics education. It is hoped that this research can be a reference or view for other researchers who will carry out research in the field of mathematics in order to find out the latest data analysis of research problems that are currently developing.

Results and Discussion

Writing in this study uses a literature study by utilizing scientific journals published by the Creative-Innovative Mathematics Journal (KREANO) from 2016 to 2021 involving a total of 156 scientific journal items. The researcher chose the Creano Mathematics Journal because: This journal has been published by the Mathematics Department of UNNES in collaboration with AMLI through the Decree of the Ministry of Law and Human Rights, besides that the KREANO journal also has an *international ISSN* published by LIPI and is *indexed by ACI (Asean Citation Index)* and has been accredited by SINTA 2.

Research by evaluating or *reviewing* by analyzing *trends and best practices* related to problems in mathematics education has been carried out, such as Rusdiana's research, (2014) through his book entitled "*Learning Evaluation with the 2013 Curriculum Approach*" providing solutions on how to evaluate a problem through an appropriate approach. with the 2013 curriculum .

The results of a research review by Hasbullah, (2015) on the problem of learning models that are suitable for mathematics learning conclude that *blended learning* is a *trend and strategy* for learning mathematics in the future. Furthermore, Asmara & Suparman's research, (2018) through the title "*Trend of Evaluation in Mathematics Education*" to overcome the problem of the direction of the view of the nature of mathematics, namely the level of students' thinking through TIMMS.

Sudarsono, (2019) examines the trend of mathematics education research through the *international STEM Journal (Science Technology Engineering and Mathematics)* accredited by SINTA 4 with the title "Research Trends in Mathematics Learning Analysis Journal of Science, Technology, Engineering and Mathematics (STEM)" concluded that Mathematics education research in STEM learning with a focus on the topic "on culture, social issues, and gender in STEM education" is the most studied. Research (Fobia et al., 2021) with the title "*Trend blended learning for the development of Students' Mathematical Thinking skills*" concluded that the *blended learning design used Moodle LMS to develop Students' Mathematical Thinking Skills*. And the current research trend is WarangAngin et al., (2021) through their *review* in the SINTA 3 accredited JRPM Journal concluded that current and future research studies the process and high-level thinking skills of 4C with the topic of an independent campus that will influence the subject through *blended learning design* . Based on previous relevant research, the SHINTA 2 accredited "*Trend and Best in Mathematics Education Research in the Creative-Innovative Mathematics Journal (KREANO)*" research is important to be analyzed as a further research update.

This Literature Study defines 3 discussion references, namely the topic or theme of the problem being studied and discussed, the subject used for research, the model used and the approach or method used in the research.

Research in 2016-2017

Research on mathematics education from 2016 to 2017 in the KREANO Journal managed by the State University of Semarang is shown in table 1. In this table, the most studied theme of the study is about students' thinking skills, such as (Andhani, 2016; Fuad, 2016; Pambudiarso et al., 2016; Rasyid, 2017; Rochmad & Masrukan, 2016; L. N. Sari, 2016; Tatak et al., 2016), etc. examine mathematical thinking skills, namely mathematical critical thinking ability, mathematical reasoning thinking ability, mathematical problem-solving thinking.

Table 1. Study Themes for 2016-2017

No	Theme	Amount
1	Contextual Issues	1
2	Model Design, Development Design, Curriculum, Learning Tools	17
3	Thinking Ability	26
4	Literacy	1
5	Media or technology	6
6	PISA/HOTS	1
7	Affective (motivation/independence)	2

Judging from the subjects chosen in the mathematics education research in the previous two years, namely 2016 to 2017, it was more dominant to take research subjects in junior high school students or equivalent. Table 2 shows a recapitulation of the dominant past mathematics education research subjects by focusing on students only. There has been no research whose subject was addressed to the teacher as a facilitator, and a small number of researchers who took the subject of research on elementary school students equivalent. However, what is interesting is related to research that has been aimed at the school level with special needs to be used as research subjects. This is evidence that research in mathematics education is far more developed than previous studies.

Table2. Research Subjects 2016 -2017

No	Theme	Amount
1	Elementary school/equivalent	3
2	Junior High School/Equivalent	32
3	High school/equivalent	11
4	Student	7
5	Teacher	0
6	Extraordinary school	1

The research method for mathematics education in the previous two years used more descriptive qualitative research with the data shown in table 3. The type of research in the past has 7 types of research, this shows that previous researchers have diverse tendencies. In addition to the type of qualitative descriptive research, previous research also refers to the type of development research, such as (Asikin et al., 2017; Dwijayani, 2017; Ose, 2017; Y. Y. Putra et al., 2016; Ramadhani, 2016; Setyadi & Qohar, 2017; Suyanto, 2016) furthermore there is research with case study research types such as (Irfan, 2017), experimental research types such as (Amalia & Surya, 2017; Hartini et al., 2016; Kurniati et al., 2017; Malau, 2017; Pambudiarso et al., 2016).

Table3. Type of Research Year 2016 -2017

No	Types of research	Amount
1	Qualitative Descriptive Research	24
2	Quantitative Descriptive	4

	Research	
3	Case study	2
4	Education survey	2
5	Experimental Research	4
6	Classroom action research	2
7	R&D Research and Development	16

Research in 2018-2019

Mathematics education research in 2018 to 2019 in the Journal is seen in table 4. In this table the most studied theme of study is about students' thinking skills and the design of model development and learning tools has the same number. In 2018-2019 researchers have increased a lot of efforts in making attractive learning designs in improving student learning outcomes so that research is not only student-centered but can be viewed from other aspects. There is also little research on contextual issues. moreover, this year researchers prefer creative thinking skills such as (H. D. Putra et al., 2018); (R. Dewi et al., 2018); (Adhiwibowo, 2018); (Hidayad, 2019)and others. Research with model design development is dominated with a PBL design such as research conducted by (Asih et al., 2019)and (Rokhim et al., 2019).

Table 4. Study Themes for 2018-2019

No	Theme	Amount
1	Contextual Issues	2
2	Model Design, Development Design, Curriculum, Learning Tools	11
3	Thinking Ability	11
4	Literacy	1
5	Media or technology	8
6	PISA/HOTS	2

Judging from the research subject, mathematics education research in 2018-2019 tends to be balanced in choosing research subjects at the secondary and higher education levels as shown in table 5. Interestingly, the selection of research subjects this year is the selection of students as research objects as an effort to prepare prospective teachers. who are creative, innovative who are able to create students who excel in preparing learning in the 5.0 era such as research: (Parhusip & Susanto, 2018); (Rachmani, 2018); (Sopiany, 2018); (Sa & Dian, 2018); (Hanifah & Abadi, 2018); (Santoso, 2019)and others. However, it is still not found in 2018-2019 mathematics education research chooses teachers as research subjects.

Table5. Research Subjects 2018 -2019

No	Theme	Amount
1	Elementary school/equivalent	3
2	Junior High School/Equivalent	13
3	High school/equivalent	5

4	Student	14
5	Teacher	0
6	Extraordinary school	0

Mathematics education research methods in 2018-2019 used many types of qualitative descriptive research such as; (Parhusip & Susanto, 2018); (Widodo et al., 2018); (Pradani & Ilman, 2019); (Firdaus & Nisa, 2019)etc; and R&D development research such as research; (Lestari & Aisyah, 2018)and (Pratama et al., 2019). Interestingly, experimental research methods are also superior, such as the research of (Putu et al., 2019)and (Baist et al., 2019)with the data shown in table 3. The type of research in the past has 7 types of research and currently only 6 types are dominated. research with the selection of project-based methods is more dominant. This shows that previous researchers have a tendency to choose instructional designs to improve students' thinking skills in solving problems by acquiring new skills in learning mathematics directly so that students can be more active in solving problems through complex projects with tangible results.

Table6. Types of Research Year 2018 -2019

No	Types of research	Amount
1	Qualitative Descriptive Research	12
2	Quantitative Descriptive Research	2
3	Case study	1
4	Education survey	0
5	Experimental Research	9
6	Classroom action research	1
7	R&D Research and Development	10

Research in 2020-2021 (Current)

Mathematics education research in 2020 to 2021, the topics or themes of the problems studied are related to themes that are influenced by the rapid development of science and technology so that they have an impact on the methods and learning approaches used. In the current reform era, in learning students must be competent in the global community so that students are required to have skills in life skills known as 4C skills (Zakaria, 2021). However, based on the results of the analysis on mathematics education research in the Creative and Innovative Mathematics Journal (KREANO) in 2020-2021, it was found that studies focused more on students' mathematical thinking abilities in terms of cognitive only in mathematics science through the development of teaching materials and the development of learning media.

Students' mathematical thinking ability in the context of 21st century learning based on the results of the recapitulation of mathematics education research in Kreano journals can be concluded and grouped based on the topic of study, namely: 1) mathematical understanding ability by linking students' prior knowledge researched by (Azis et al., 2021); then 2) the ability to solve mathematical problems examined by (B. Permatasari & Prihatnani, 2021); (Nursyahidah, 2021); (Rahmawati et al., 2021); (Pujiastuti, 2020); (N. R. Dewi et al., 2020)with balanced research subjects between students at the junior high, high school and college level; then 3) mathematical reasoning ability was investigated by

(Maidiyah et al., 2021) in junior high school students; (Prihatin & Oktaviana, 2021) on students; 4) Mathematical communication skills were studied by (S. M. Sari & Pujiastuti, 2020) and (Khaerunnisa et al., 2021); 5) mathematical critical thinking skills were investigated by (Arisetyawan et al., 2021) and (D. Permatasari & Lampung, 2021); 7) creative thinking skills were researched by (Ardiansyah et al., 2020) and (Ramadhan et al., 2021); 8) topics related to student representation were investigated by (Yuliardi et al., 2021). It can be concluded that research in 2020-2021 studies more about students' mathematical thinking abilities in terms of cognitive, according to (Hendriana, 2017) the components that are included in the cognitive domain of students are grouped in mathematical *hard skills*. So that learning in the 21st century not only prioritizes student skills but also students' mathematical thinking abilities because both occur at the same learning time (Delita et al., 2016).

In an effort to improve students' mathematical thinking skills, researchers provide solutions such as designing learning models, developing teaching materials, using media such as (Wiralodra & Barat, 2020); (Sulasteri et al., 2021); (Wijayanti & Semarang, 2021); (Romadiastri, 2020).

Media must be implemented by selecting the right learning model according to (Setyani et al., 2020) so that learning is maximized. In this study, the design model offered is through the development of the IDEAL problem-solving model by (Rahmawati et al., 2021), Maidiyah et al.'s PBL model (Maidiyah et al., 2021), then (Astutiani et al., 2021) providing solutions with *problem solving efforts. ability (PSA) in Missouri Mathematics Project (MMP) assisted by digital media and Discovery Learning (DL) models to achieve learning, Blended learning* and others.

In addition, it was found that research in innovative creative mathematics journals (Kreano) from 2020 to 2021 produced 10 teaching material products such as the research developed by (Ismail et al., 2021) with the *type of Research and Development (R&D) research through 4 (four) stages*; (Widyasari & Jakarta, 2021) through his research by developing teaching materials in the form of E-learning *Comic based mathematics teaching materials on the topic of multiplication and division with the Realistic Mathematics Education (RME) approach* using the Hannafin and Peck development model, and others.

The minister of education program with its latest breakthroughs through the independent learning program, (Kemendikbud, 2020) which demands the efforts of teachers as facilitators in creating a generation of students who are able to compete and have character will also influence the direction and trend of future mathematics education research. Thinking skills and thinking skills of students in the independent learning program will be a new realm for future mathematics education researchers. And of course future researchers will be more in line with inter-institutional institutions and campuses in carrying out research.

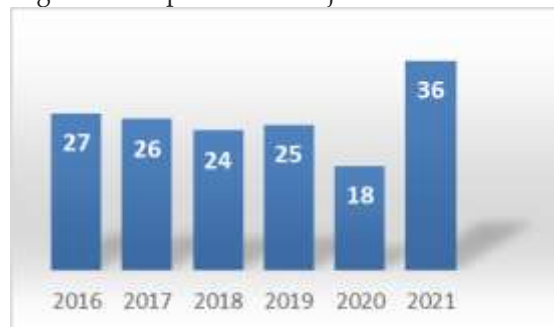
The current research method in mathematics education research, namely in 2020 to 2021 in particular, uses more *research on new product development methods* with the aim of making a new product that can be used as a support in the learning process, quasi-experimental, case studies, *mixed method research*, approach others such as project-based by applying new methods or new technologies in learning.

(Stephan et al., 2015) address the biggest challenges that will be faced in mathematics education, namely; 1) math work (*doing mathematics*); 2) the role of mathematics in society (*the role of mathematics in society*); and 3) equality in mathematics education (*equity in mathematics education*). (Darwanto, 2019) said that students' mathematical *hard skills* are contained in the curriculum in Competencies that are formulated to be achieved, which include all Core Competencies and Basic Mathematics Competencies at the level of each class.

(Hendarman & Cantner, 2018) said that mathematical work is about how the work can solve problem solving, reasoning, curiosity, excitement, and not just following procedures to get answers. The role of mathematics in society means that it is necessary to see that mathematics can be observed through human activities in everyday life, while equality in mathematics education means that all targets in mathematics education must be achieved by all groups and ranks and no one should be left behind. This is in line with the Incheon declaration which states that inclusion and equity in the Education approach are the cornerstone of the transformative education agenda (UNESCO, 2015)

In accordance with the results of the researcher's analysis based on the results of research in previous studies from 2016 to 2021, there were 156 studies published in journals. creative-innovative mathematics (KREANO) thus averages 26 items per year. Figure 1 shows the number of items published for each year, from 2016 to 2021.

Figure 1. Items published in the journal Period 2016-2021



This figure shows that the journal has started to publish many items since 2021, namely 36 publications compared to the previous year 2020, which was 18 publications. So it can be said that the increasing number of publications interest in creative-innovative mathematics research journals (Kreano). Following are the details of 156 publications by type per year with the highest number of discussion publications in table 7

Table 7. Type of Research Year 2016-2021

Year	Mathematical Thinking Ability study topic	Subject Student/teacher	Type of research Experiment/ Research and Development
2016	13	3	4
2017	13	4	16
2018	4	7	5
2019	7	7	14
2020	5	4	10
2021	9	7	19
Total	51	32	68

Conclusion

The era of industrial revolution 5.0 which is growing rapidly has changed the way of thinking about education. Changes made in the current and future concept of curriculum

development require teachers to provide solutions to problems that arise. In an effort to overcome problems that arise in the learning process, namely by demanding prospective teachers or teachers in increasing learning creativity. In addition, by involving students directly in learning activities can improve students' thinking skills through the real world from the experiences they get. Involving him in team work and collaborating with peers in small projects can be a support in efforts to answer the challenges of 21st century learning.

Therefore, it is hoped that future research on mathematics education research will also examine mathematical thinking skills by creating technology-assisted learning in an open, *flexible* project-based learning environment so that students are able to collaborate in developing their potential. Teachers are required to be able to implement the curriculum to innovate in learning with various approaches, models, strategies, methods, which are effective in preparing students' competencies and skills towards the 21st century.

Reference

- Adhiwibowo, B. (2018). *Pengembangan Perangkat Pembelajaran Berbasis Masalah Pada kreativitas Matematis*. 9(2), 174-183.
- Ali, R., Kuriqi, A., Abubaker, S., & Kisi, O. (2019). Long-term trends and seasonality detection of the observed flow in Yangtze River using Mann-Kendall and Sen's innovative trend method. *Water (Switzerland)*, 11(9), 1-17. <https://doi.org/10.3390/w11091855>
- Amalia, P., & Surya, E. (2017). Perbedaan Hasil Belajar Statistika antara Model Pembelajaran Kooperatif Tipe NHT dengan TPS. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 8(1), 8-14. <https://doi.org/10.15294/kreano.v8i1.7682>
- Andhani, R. A. (2016). Representasi Eksternal Siswa dalam Pemecahan Masalah SPLDV Ditinjau dari Kemampuan Matematika. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 7(2), 179-186. <https://doi.org/10.15294/kreano.v7i2.6615>
- Ardiansyah, A. S., Fariz, R., & Khoirunnisa, K. (2020). Prespektif Gender terhadap Kemampuan Berpikir Kreatif Mahasiswa pada Blended Learning berbantu Google Classrooms. *Jurnal Matematika Kreatif Inovatif Kreano*, 11(2), 245-255.
- Arisetyawan, A., Taher, T., Fauzi, I., Serang, I. K., & Pendidikan, U. (2021). Integrating the Concept of Plane Figure and Baduy Local Wisdom as a Media Alternative of Mathematics Learning In Elementary Schools. *Jurnal Matematika Kreatif Inovatif Kreano*, 12(1), 1-13.
- Asih, I., Yandhari, V., Alamsyah, T. P., & Halimatusa, D. (2019). Penerapan Strategi Pembelajaran Problem Based Learning untuk Meningkatkan Kemampuan Pemecahan Masalah Matematis Siswa Kelas IV SD. *Jurnal Matematika Kreatif -Inovatif*, 10(2), 146-152.
- Asikin, M., Rochmad, R., & Kurniasih, A. W. (2017). Pengembangan Perangkat Pembelajaran Telaah Kurikulum Matematika 1 Mengintegrasikan Kreativitas dan Karakter Cerdas Melalui Pembelajaran Kooperatif Berbasis Asesmen Proyek. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 8(1), 15-26. <https://doi.org/10.15294/kreano.v8i1.4983>

- Astutiani, R., Pascasarjana, M., & Semarang, U. N. (2021). Problem Solving Ability Considered by Self Confidence in Digital Media Assisted Online Learning. *Jurnal Matematika Kreatif Inovatif Kreano*, 12(2), 323–334.
- Azis, Y. M., Leatemala, M., & Ambon, P. N. (2021). The Effectiveness of e-Learning, Learning Styles, Prior Knowledge, and Internet Self-Efficacy in Business Mathematics Courses. *Jurnal Matematika Kreatif Inovatif Kreano*, 12(2), 353–365.
- Baist, A., Pradja, B. P., Nopitasari, D., & Pamungkas, A. S. (2019). Optimalisasi Performa Mahasiswa Melalui Penggunaan Bahan Ajar Komputasi Matematika Berbantuan Software Mathematica. *Jurnal Matematika Kreatif-Inovatif*, 10(2), 165–170.
- Bastos, M. G., & Mendonça, A. P. (2016). Programa arquitetônico para alunos iniciantes: Uma proposta de ensino. *International Symposium on Project Approaches in Engineering Education*, 6.
- Castellani, C., Duff, A. J. A., Bell, S. C., Heijerman, H. G. M., Munck, A., Ratjen, F., Sermet-Gaudelus, I., Southern, K. W., Barben, J., Flume, P. A., Hodková, P., Kashirskaya, N., Kirszenbaum, M. N., Madge, S., Oxley, H., Plant, B., Schwarzenberg, S. J., Smyth, A. R., Taccetti, G., ... Drevinek, P. (2018). ECFS best practice guidelines: the 2018 revision. In *Journal of Cystic Fibrosis* (Vol. 17, Issue 2). <https://doi.org/10.1016/j.jcf.2018.02.006>
- Darmayanti, R., Baiduri, B., & Sugianto, R. (2022). Learning Application Derivative Algebraic Functions: Ethnomathematical Studies and Digital Creator Books. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 06(02), 2212–2227.
- Darmayanti, R., Sugianto, R., Baiduri, Choirudin, & Wawan. (2022). Digital comic learning media based on character values on students' critical thinking in solving mathematical problems in terms of learning styles. *Al-Jabar: Jurnal Pendidikan Matematika*, 13(1), 49–66. <http://ejournal.radenintan.ac.id/index.php/al-jabar/index>
- Darmayanti, R., Syaifuddin, M., Rizki, N., Sugianto, R., & Hasanah, N. (2022). High school students' mathematical representation ability: Evaluation of disposition based on mastery learning assessment model (MLAM). *Journal of Advanced Sciences and Mathematics Education*, 2(1), 1–15. <https://www.journal.foundae.com/index.php/jasme/index://creativecommons.org/licenses/by-sa/4.0/>
- Darwanto, D. (2019). Hard Skills Matematik Siswa. *Jurnal Eksponen*, 9(1), 21–27. <https://doi.org/10.47637/eksponen.v9i1.129>
- Delita, F., Elfayeti, & Sidauruk, T. (2016). Peningkatan Soft Skills Dan Hard Skills Mahasiswa Melalui Project-Based Learning Pada Mata Kuliah Perencanaan Pembelajaran Geografi. *Journal Geografi Universitas Negeri Medan*, 8(2), 124–135.
- Dewi, N. R., Munahefi, D. N., & Azmi, K. U. (2020). Kemampuan Pemecahan Masalah Matematis Mahasiswa pada Pembelajaran Preprospec Berbantuan TIK. *Jurnal Matematika Kreatif Inovatif Kreano*, 11(2).
- Dewi, R., Ilma, R., Putri, I., & Hartono, Y. (2018). Pengembangan Multimedia Interaktif Berbasis PMRI Materi Jajargenjang. 9(1), 78–83.

- Dwijayani, N. M. (2017). Pengembangan Media Pembelajaran ICARE. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 8(2), 126–132. <https://doi.org/10.15294/kreano.v8i2.10014>
- Effendi, M. M., Darmayanti, R., & In'am, A. (2022). Strengthening Student Concepts: Problem Ethnomatematics Based Learning (PEBL) Singosari Kingdom Historical Site Viewed from Learning Styles in the Middle School Curriculum. *Indomath: Indonesia Mathematics Education*, 4(1), 1–10. <https://jurnal.ustjogja.ac.id/index.php/>
- Farida, R., Alba, A., Kurniawan, R., & Zainuddin, Z. (2019). Pengembangan Model Pembelajaran Flipped Classroom Dengan Taksonomi Bloom Pada Mata Kuliah Sistem Politik Indonesia. *Kwangsan: Jurnal Teknologi Pendidikan*, 7(2), 104. <https://doi.org/10.31800/jtp.kw.v7n2.p104--122>
- Fauza, M. R., Inganah, S., Darmayanti, R., Prasetyo, B. A. M., & Lony, A. (2022). Problem Solving Ability: Strategy Analysis of Working Backwards Based on Polya Steps for Middle School Students YALC Pasuruan. *Jurnal Edukasi Matematika Dan Sains*, 10(2), 353–363. <https://doi.org/10.25273/jems.v10i2.13338>
- Firdaus, A., & Nisa, L. C. (2019). Kemampuan Berpikir Kritis Siswa pada Materi Barisan dan Deret Berdasarkan Gaya Berpikir. *Jurnal Matematika Kreatif-Inovatif*, 10(1), 68–77.
- Fobia, M. S., Nenohai, Y. M. H., & Samo, D. D. (2021). TREN BLENDED LEARNING UNTUK PENGEMBANGAN KETERAMPILAN BERPIKIR MATEMATIKA SISWA. *Jurnal Matematika Dan Pendidikan Matematika*, 2(2), 94–104.
- Fuad, Moh. N. (2016). Representasi Matematis Siswa SMA dalam Memecahkan Masalah Persamaan Kuadrat Ditinjau dari Perbedaan Gender. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 7(2), 145–152. <https://doi.org/10.15294/kreano.v7i2.5854>
- González-María, E., Moreno-Casbas, M. T., Albornos-Muñoz, L., Grinspun, D., Moreno-Casbas, T., Abad-Sanz, C., Alonso-Poncelas, M. E., Arza-Alonso, N., Fernández-Núñez, M. L., Folguera-Arnau, M., González-Gallego, M., Gutiérrez-Vilaplana, J. M., Lorente-Granados, G., Martínez-González, M. A., Martínez-Muñoz, M., Martínez-Pallí, G., Mateo-Cervera, A. M., Ortiz de Elguea-Díaz, F. J., Ortuño-Soriano, I., ... Vallés-García, S. (2020). The implementation of Best practice guidelines in Spain through the Programme of the Best Practice Spotlight Organizations®. *Enfermería Clínica*, 30(3). <https://doi.org/10.1016/j.enfcli.2019.09.018>
- Hanifah, & Abadi, A. P. (2018). Hubungan antara Pemahaman Konsep dan Kecemasan Menghadapi Mata Kuliah Teori Grup dengan Prestasi Akademik Mahasiswa. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 9(2), 156–163.
- Hartini, H., Maharani, Z. Z., & Rahman, B. (2016). Penerapan Model Pembelajaran Think-Pair-Share untuk Meningkatkan Kemampuan Komunikasi Matematis Siswa SMP. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 7(2), 131–135. <https://doi.org/10.15294/kreano.v7i2.5009>
- Hendarman, A. F., & Cantner, U. (2018). Soft skills, hard skills, and individual innovativeness. *Eurasian Business Review*, 8(2). <https://doi.org/10.1007/s40821-017-0076-6>

- Hendriana, H. (2017). Meningkatkan Kemampuan Matematik Siswa Melalui Pembelajaran Berbasis Masalah Dan Strategi Think Talk and Write. *Edusentris*, 1(1), 27. <https://doi.org/10.17509/edusentris.v1i1.132>
- Hidayad, A. (2019). Desain Pembelajaran Berbasis Proyek Dalam Pembiasaan Berpikir Kreatif Calon Guru Matematika. *Jurnal Matematika Kreatif-Inovatif*, 10(1), 1-9.
- Huang, J., Lok, V., Ngai, C. H., Zhang, L., Yuan, J., Lao, X. Q., Ng, K., Chong, C., Zheng, Z. J., & Wong, M. C. S. (2021). Worldwide Burden of, Risk Factors for, and Trends in Pancreatic Cancer. *Gastroenterology*, 160(3). <https://doi.org/10.1053/j.gastro.2020.10.007>
- Humaidi, N., Darmayanti, R., & Sugianto, R. (2022). Challenges of Muhammadiyah's Contribution in Handling Covid-19 in The MCCC Program in Indonesia. *Khazanah Sosial*, 4(1), 176-186. <https://doi.org/10.15575/ks.v4i1.17201>
- Hung, J. C., & Wang, C. C. (2021). Exploring the website object layout of responsive web design: results of eye tracking evaluations. *Journal of Supercomputing*, 77(1). <https://doi.org/10.1007/s11227-020-03283-1>
- Irfan, M. (2017). Analisis Kesalahan Siswa dalam Pemecahan Masalah Berdasarkan Kecemasan Belajar Matematika. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 8(2), 143-149. <https://doi.org/10.15294/kreano.v8i2.8779>
- Ismail, I., Angriani, A. D., Kusumayanti, A., Islam, U., & Alauddin, N. (2021). Development of Measurement Tool for Understanding, Application, and Reasoning Mathematics of Madrasah Ibtidaiyah Students. *Jurnal Matematika Kreatif Inovatif Kreano*, 12(1), 26-38.
- Kemendikbud. (2020). *Panduan Penyusunan Kurikulum Pendidikan Tinggi DI ERA INDUSTRI 4.0 UNTUK MENDUKUNG MERDEKA BELAJAR-KAMPUS MERDEKA*.
- Khaerunnisa, E., Khasanah, M., Tirtayasa, A., & Sultan, U. (2021). Development of LKS With a STEM Approach that Supports The Mathematical Communication Skills of SMP Students. *Jurnal Matematika Kreatif Inovatif Kreano*, 12(2), 200-211.
- Kurniati, I. W., Pujiastuti, E., & Kurniasih, A. W. (2017). Model Pembelajaran Discovery Learning Berbantuan Smart Sticker untuk Meningkatkan Disposisi Matematik dan Kemampuan Berpikir Kritis. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 8(2), 109-118. <https://doi.org/10.15294/kreano.v8i2.5060>
- Lei, T., Yu, X., Zou, M., Wang, P., & Yuan, R. H. (2021). Delivering an online course in emergency nursing education during the pandemic: What are the effects on students' learning? *Australasian Emergency Care*, 24(4), 314-318. <https://doi.org/10.1016/j.auec.2021.04.002>
- Lestari, D., & Aisyah, N. (2018). Pengembangan LKS Berbasis Teori Apos Materi Bangun Ruang Sisi Datar Konteks Rumah Adat Musi Banyuasin. 9(1), 1-9.
- Maidiyah, E., Anwar, N., Zaura, B., Harnita, F., Pendidikan, J., & Kuala, U. S. (2021). Mathematical Reasoning Ability of Junior High School Students Through Problem Based Learning Model with Ethnomathematical Nuances. *Jurnal Matematika Kreatif Inovatif Kreano*, 12(2), 276-287.

- Malau, T. M. (2017). Improvement Students Spatial Ability and Self Confidence Through Inquiry Learning With Geogebra at SMA Negeri 19 Medan. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 8(2), 215–220. <https://doi.org/10.15294/kreano.v8i2.9675>
- Nafi'a, M. I., & Pradani, S. L. (2019). Analisis Kemampuan Pemecahan Masalah Siswa dalam Menyelesaikan Soal Matematika Tipe Higher Order Thinking Skill (HOTS). *Kreano, Jurnal Matematika Kreatif-Inovatif*, 10(2), 112–118.
- Nursyahidah, F. (2021). Supporting 7th Grade Students' Understanding of Angles using Central Java Traditional House Hartono1. *Jurnal Matematika Kreatif Inovatif Kreano*, 12(2), 212–226.
- Ose, L. (2017). Pengembangan Perangkat Pembelajaran dengan Pendekatan PMR untuk Meningkatkan Hasil Belajar Siswa. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 8(1), 101–108. <https://doi.org/10.15294/kreano.v8i1.6981>
- Palmer, M. (2021). Study of Future Public Library Trends & Best Practices. *Public Library Quarterly*. <https://doi.org/10.1080/01616846.2020.1868224>
- Pambudiarso, R. B., Mariani, S., & Prabowo, A. (2016). Komparasi Kemampuan Pemecahan Masalah Materi Geometri Antara Model SPS dan Model SPS Dengan Hands On Activity. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 7(1), 1–9. <https://doi.org/10.15294/kreano.v7i1.4739>
- Parhusip, H. A., & Susanto, B. (2018). Inovasi Geometri sebagai Media Pembelajaran Matematika Kreatif. 9(1), 63–70.
- Permatasari, B., & Prihatnani, E. (2021). The Development of Jateng Gayeng Monopoly Media: Learn Unit Conversion by Loving Culture. *Jurnal Matematika Kreatif Inovatif Kreano*, 12(2), 238–251.
- Permatasari, D., & Lampung, U. (2021). Analysis of Critical Thinking Ability in Solving Linear Programming Problems in terms of Students' Self-Concepts. *Jurnal Matematika Kreatif Inovatif Kreano*, 12(2), 335–352.
- Postma, A., & Papp, B. (2020). Of trends and trend pyramids. *Journal of Tourism Futures*, 7(2). <https://doi.org/10.1108/JTF-11-2019-0129>
- Pratama, O. R., Lutfianto, M., & Noviantati, K. (2019). Pengembangan Soal Matematika Mirip TIMSS Yang Memuat Nilai Karakter. *Jurnal Matematika Kreatif-Inovatif*, 10(2), 179–185.
- Prihatin, I., & Oktaviana, D. (2021). Development of Mathematical Logic Practicum Module Based on PhET Simulation to Improve Students' Reasoning Ability. *Jurnal Matematika Kreatif Inovatif Kreano*, 12(2), 189–199.
- Pujiastuti, W. C. (2020). Analisis Kemampuan Pemecahan Masalah Matematika Ditinjau Dari Gender. *Jurnal Matematika Kreatif Inovatif Kreano*, 11(1), 110–117.
- Putra, H. D., Akhdiyati, A. M., Setiany, E. P., & Andiarani, M. (2018). Kemampuan Berpikir Kreatif Matematik Siswa SMP di Cimahi. 9(1), 47–53.
- Putra, Y. Y., Zulkardi, Z., & Hartono, Y. (2016). Pengembangan Soal Matematika Model PISA Level 4, 5, 6 Menggunakan Konteks Lampung. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 7(1), 10–16. <https://doi.org/10.15294/kreano.v7i1.4832>

- Putu, N., Ayuningsih, M., & Dwijayani, N. M. (2019). Pengaruh Model Treffinger Berorientasi Kearifan Lokal Berbantuan Tugas Berjenjang Terhadap Self Efficacy Matematika Siswa SMP. *Jurnal Matematika Kreatif-Inovatif*, 10(1), 105–111.
- Rachmani, N. (2018). Kemampuan Koneksi Matematis Mahasiswa Calon Guru pada Brain-Based Learning Berbantuan Web. 9(2), 204–214.
- Rahmah, K., Inganah, S., Darmayanti, R., Sugianto, R., & Ningsih, E. F. (2022). Analysis of Mathematics Problem Solving Ability of Junior High School Students Based on APOS Theory Viewed from the Type of Kolb Learning Style. *INDoMATH: Indonesia Mathematics Education*, 5(2), 109–122. <https://indomath.org/index.php/>
- Rahmawati, M., Kurniati, D., Trapsilasiwi, D., Osman, S., & Jember, U. (2021). The Students' Truth-Seeking Behaviour in Solving the Problems With No Specified Universal Set Based on IDEAL Problem Solving. *Jurnal Matematika Kreatif Inovatif Kreano*, 12(2), 302–311.
- Ramadhan, S., Effendi, M. M., Ummah, S. K., & Malang, U. M. (2021). Exploration of Relational Thinking Skills Using Problem Solving of Geometry Transformation. *Jurnal Matematika Kreatif Inovatif Kreano*, 12(2), 288–301.
- Ramadhani, R. (2016). Pengembangan Perangkat Pembelajaran Matematika yang Berorientasi pada Model Problem Based Learning. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 7(2), 116–122. <https://doi.org/10.15294/kreano.v7i2.7300>
- Rasyid, M. A. (2017). Profil Berpikir Reflektif Siswa SMP dalam Pemecahan Masalah Pecahan Ditinjau dari Perbedaan Gender. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 8(2), 171–181. <https://doi.org/10.15294/kreano.v8i2.9849>
- Rizki, N., Laila, A. R. N., Inganah, S., & Darmayanti, R. (2022). Analysis of Mathematic Connection Ability in Mathematics Problem Solving Reviewed from Student's Self-Confidence. *Seminar Nasional Teknologi Pembelajaran*, 2(1), 111–126. <http://snastep.um.ac.id/pub/index.php/proceeding/indexKeahlianPerformaPakar dalamTeknologiPendidikan untuk>
- Rochmad, R., & Masrukan, M. (2016). Studi Kinerja Mahasiswa dalam Menganalisis Materi Pada Pembelajaran Kooperatif Resiprokal. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 7(1), 47–57. <https://doi.org/10.15294/kreano.v7i1.4986>
- Rokhim, A. F., Amin, S. M., & Fuad, Y. (2019). Keefektifan Problem Based Learning pada Materi Aritmetika Sosial Kelas VII SMP. *Jurnal Matematika Dan Pendidikan Matematika*, 10(1), 10–17.
- Romadiastri, Y. (2020). Pengembangan Perangkat Pembelajaran Reflektif Berbasis Unity of Sciences untuk Menciptakan Calon Guru Matematika Profesional. *Jurnal Matematika Kreatif Inovatif Kreano*, 11(2), 173–184.
- Sa, N., & Dian, H. (2018). Pengembangan Modul Praktikum Berbasis Analisis Data Pada Mata Kuliah Statistik Dalam Meningkatkan Belajar Mandiri Mahasiswa. 9(2), 198–203.
- Sah, R. W. A., Laila, A. R. N., Setyawati, A., Darmayanti, R., & Nurmalitasari, D. (2023). Misconception Analysis of Minimum Competency Assessment (AKM) Numeration of

- High School Students from Field Dependent Cognitive Style. *Jurnal Edukasi Matematika Dan Sains*, 11(1), 58–69. <https://doi.org/10.25273/jems.v11i1.14112>
- Santoso, D. (2019). Geometer ' s Sketchpad (GSP) dan Pemahaman Konsep Geometri Analitik Bidang. *Jurnal Matematika Kreatif-Inovatif*, 10(2), 153–158.
- Sari, L. N. (2016). Proses Berpikir Kreatif Siswa SMP dalam Memecahkan Masalah Matematika Nonrutin Ditinjau dari Kemampuan Matematika. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 7(2), 163–170. <https://doi.org/10.15294/kreano.v7i2.5919>
- Sari, S. M., & Pujiastuti, H. (2020). Analisis Kemampuan Komunikasi Matematis Siswa ditinjau dari Self-Concept. *Jurnal Matematika Kreatif Inovatif Kreano*, 11(1), 71–77.
- Sekaryanti, R., Cholily, Y. M., Darmayanti, R., Rahma, K., Prasetyo, B., & Maryanto, A. (2022). Analysis of Written Mathematics Communication Skills in Solving Solo Taxonomy Assisted Problems. *Jurnal Edukasi Matematika Dan Sains*, 10(2), 395–403. <https://doi.org/10.25273/jems.v10i2.13707>
- Setyadi, D., & Qohar, A. (2017). Pengembangan Media Pembelajaran Matematika Berbasis Web Pada Materi Barisan Dan Deret. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 8(1), 1–7. <https://doi.org/10.15294/kreano.v8i1.5964>
- Setyani, B., Murtono, M., & Utomo, S. (2020). Pengaruh Model Pembelajaran PBL Terhadap Hasil Belajar Matematika Pada Siswa SDN Sari 1 Kelas V Kecamatan Gajah Kabupaten Demak. *VIVABIO: Jurnal Pengabdian Multidisiplin*, 2(1). <https://doi.org/10.35799/vivabio.2.1.2020.28803>
- Sopiany, A. N. (2018). *Mensinergikan Kemampuan Geometri dan Analisis pada Mata Kuliah Kalkulus Diferensial Melalui Bahan Ajar Berbasis Geogebra*. 9(2), 164–173.
- Stephan, U., Uhlener, L. M., & Stride, C. (2015). Institutions and social entrepreneurship: The role of institutional voids, institutional support, and institutional configurations. *Journal of International Business Studies*, 46(3), 308–331. <https://doi.org/10.1057/jibs.2014.38>
- Stewart, W. H. (2016). Book Review of Learning Online: What Research Tells Us About Whether, When and How. *Open Praxis*, 8(3). <https://doi.org/10.5944/openpraxis.8.3.333>
- Sugianto, R., Cholily, Y. M., Darmayanti, R., Rahmah, K., & Hasanah, N. (2022). Development of Rainbow Mathematics Card in TGT Learning Model for Increasing Mathematics Communication Ability. *Kreano: Jurnal Matematika Kreatif-Inovatif*, 13(2), 221–234. <http://journal.unnes.ac.id/nju/index.php/kreano>
- Sugianto, R., Darmayanti, R., Vidyastuti, A. N., Matematika, M. P., Muhammadiyah, U., Jalan, M., & Tlogomas, R. (2022). Stage of Cognitive Mathematics Students Development Based on Piaget's Theory Reviewing from Personality Type. *Plusminus: Jurnal Pendidikan Matematika*, 2(1), 17–26.
- Sulasteri, S., Nur, F., Matematika, P., Islam, U., & Alauddin, N. (2021). The Effect of Computer Laboratory Facilities and Learning Interest on Students' Learning Outcomes Sri. *Jurnal Matematika Kreatif Inovatif Kreano*, 12(1), 97–106.

- Suyanto, E. (2016). Pembelajaran Matematika Dengan Strategi TTW Berbasis Learning Journal untuk Meningkatkan Kemampuan Menulis Matematis. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 7(1), 58–65. <https://doi.org/10.15294/kreano.v7i1.5001>
- Taleb, N., & Mohamed, E. A. (2020). Cloud computing trends: A literature review. In *Academic Journal of Interdisciplinary Studies* (Vol. 9, Issue 1). <https://doi.org/10.36941/ajis-2020-0008>
- Tatak, A., Kurniawan, H., & Rudhito, M. A. (2016). Kemampuan Berpikir Relasional Siswa dalam Mengerjakan Soal Kontekstual dengan Pendekatan Realistik Pada Topik Fungsi Linear. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 7(2), 136–144.
- UNESCO. (2015). *Education 2030 : Towards inclusive and equitable quality education and lifelong. April*, 1–4.
- van der Lee, C., Gatt, A., van Miltenburg, E., & Kraemer, E. (2021). Human evaluation of automatically generated text: Current trends and best practice guidelines. *Computer Speech and Language*, 67. <https://doi.org/10.1016/j.csl.2020.101151>
- Wang, Y., Xu, Y., Tabari, H., Wang, J., Wang, Q., Song, S., & Hu, Z. (2020). Innovative trend analysis of annual and seasonal rainfall in the Yangtze River Delta, eastern China. *Atmospheric Research*, 231. <https://doi.org/10.1016/j.atmosres.2019.104673>
- Widodo, K., Budiarto, M. T., & Lukito, A. (2018). *Profil Pemecahan Masalah Kreatif Siswa MA Ditinjau dari Tingkat Math Self-Efficacy*. 9(1), 10–16.
- Widyasari, N., & Jakarta, U. M. (2021). Development of E-Comic-Based Mathematics Teaching Materials on the Topic of Multiplication and Division with Realistic Mathematics Education (RME) Approach. *Jurnal Matematika Kreatif Inovatif Kreano*, 12(2), 365–375.
- Wijayanti, K., & Semarang, U. N. (2021). The Coherence of Group Scheme of the High Initial Ability Students Based on Cognitive Style Kristina. *Jurnal Matematika Kreatif Inovatif Kreano*, 12(1), 130–149.
- Wiralodra, U., & Barat, J. (2020). Bagaimanakah Cara Siswa Tunagrahita Ringan Menyelesaikan Soal Operasi Hitung Pembagian?: Exploratory Case Study dalam menggunakan Media Kotak Puzzle Geometri. *Jurnal Matematika Kreatif Inovatif Kreano*, 11(2), 143–152.
- Wulandari, T., Nurmalitasari, D., Susanto, K., Darmayanti, R., & Choirudin. (2022). Etnomatematika Pada Batik Daun Sirih dan Burung Kepodang Khas Pasuruan. *Seminar Nasional Teknologi Pembelajaran*, 2(1), 95–103. <http://snastep.um.ac.id/pub/index.php/proceeding/index>
- Yuliardi, R., Juandi, D., Mahpudin, A., Studi, P., Matematika, P., & Bengkulu, U. (2021). Analysis of the Impact of Android Applications-based Mathematics Learning on Increasing Students' Mathematical Representation Skills. *Jurnal Matematika Kreatif Inovatif Kreano*, 12(1), 178–188.
- Zakaria. (2021). Kecakapan Abad 21 Dalam Pembelajaran Pendidikan Dasar Masa Pandemi Covid-19. *Jurnal Dirasah*, 4(2), 81–90.

Zong Chen, Dr. J. I., & S., Dr. S. (2020). Interoperability Improvement in Internet of Things Using Fog Assisted Semantic Frame Work. *Journal of Trends in Computer Science and Smart Technology*, 2(1). <https://doi.org/10.36548/jtcsst.2020.1.006>

Zuriah, N. (2021). Best Practices Polysynchronous Blended Learning Elmu Platform Pembelajaran Daring Di Era New Normal. *Jurnal Civic Hukum*, 6(1), 32-49.