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Inclusive Mathematics Education for Students with Special Educational Needs: A Systematic Review and Bibliometric Analysis of Strategies and Interventions

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Abstract

The research uses both systematic literature review and bibliometric analysis to study special educational needs students' inclusive mathematics support from2019 to 2024. The study based on PRISMA methodology conducts systematic article investigations across Scopus and Web of Science (WOS) platforms to identify three core teaching strategy categories: (1) the approach of pedagogical diversity, (2) the use of technology and learning resources, and (3) teacher assistance and support in inclusive classrooms. The bibliometric analysis, conducted using VOSviewer software, found a significant increase in publications from 2021 to 2024, with dominance from researchers in the United States. The bibliometric analysis also highlighted significant relationships between keywords such as "students," "mathematics education," "inclusive education," and "learning disabilities," reflecting the main research focus in this field. The combined findings from both analyses contribute to a deeper understanding of research trends and best practices in inclusive mathematics education, while also creating opportunities for improving existing teaching strategies, particularly in the context of integrating technology and adapting pedagogy to meet the diverse needs of students.

Keywords: Inclusive Mathematics, Special Educational Needs, Systematic Literature Review, Bibliometric Analysis, Interventions

Introduction

Inclusive education has been a global agenda since the Salamanca Declaration in 1994, which emphasised every child's fundamental right to quality education without discrimination. The United Nations' 2030 Sustainable Development Goals (SDGs) especially SDG 4 reinforce the Salamanca Declaration by setting a goal to deliver inclusive and equitable quality education for every population (Tonegawa, 2022). Many countries have developed extensive inclusive

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education policies after making international commitments to this educational principle. The Malaysian government actively supports inclusive education policies through the Education Act 1996, combined with the Malaysia Education Blueprint 2013–2025, along with the Guidelines for the Inclusive Education Program for Students with Special Educational Needs (2013). The policy framework described by these policies establishes standards for running the Inclusive Education Program (PPI) to guarantee quality education services for every student, alongside those with special educational needs (SEN).

Mathematics, as a core subject in the curriculum, plays a vital role in students' intellectual, social, and emotional development. The problem is that many students have special educational needs (SEN) and have difficulty grasping and executing math content because of cognitive, emotional, and social differences (Roos, 2023). The strategic implementation functions as a basic requirement within inclusive mathematics education to stop students with SEN from lagging in their mathematics learning. With the introduction of inclusive education, SEN students are now taken to mainstream classrooms via education customisation, including adaptations in both curricula and teaching strategies, and learning environments. This technique helps SEN students to gain the same educational experiences as their peers while fostering active acceptance of school community members.

This study aims to systematically review the strategies and interventions that have been implemented in inclusive mathematics education for students with special educational needs (SEN). This review is essential in identifying best practices, highlighting gaps in existing research, and proposing new approaches to enhance the effectiveness of mathematics instruction in inclusive settings. The investigation provides new insights for developing effective educational practices that aid teacher interventions for SEN children studying mathematics through inclusive classrooms. This study's predicted findings will enable the joint development of exceptional mathematics educational programmes by educators and policymakers while including all students.

Inclusive Mathematics Education

The strategic teaching strategy for mathematics as inclusive education provides every student, along with students with special educational needs, access to equitable learning environments which support diversity and fairness (Malin, 2023). This concept emphasises the integration of students with varying abilities into mainstream classrooms, where the curriculum, teaching strategies, and assessments are adapted to meet individual needs without compromising the quality of education.

The Ministry of Education Malaysia, through Special Education Regulations 2013, established the Inclusive Education Program as an educational infrastructure to serve students with special educational needs (SEN) while situated with mainstream student classes in government or government-aided schools. Ali and Nasri (2021) demonstrate through their study that the educational program enhances the academic performance and co-curricular performance of SEN students to create a better future that prevents these students from being excluded from the national education system's progress. Government commitment to inclusive education manifests through its creation of different school types that run both the Integrated Special Education Program (PPKI) and Inclusive Education Program (IEP), thus demonstrating its purpose to offer special educational needs students meaningful learning

opportunities (Ahmad, 2024). The programmes enable SEN students to get educational instruction alongside developing their school social bonds and community adjustment in the institutional setting. The programmes enable students to grow into successful, independent, productive members of society.

It implements the principles of inclusive education that reject the notion of separation for students with special educational needs (SEN) from being part of the regular classroom setting. In particular, teachers are in the role of ensuring that all students, including those with specific learning disorders (e.g., dyslexia or dyscalculia), physical disabilities, or other developmental challenges, have equal access to mathematics in terms of accessible teaching materials, learning activities, and the dissemination of these resources across a diverse classroom (Wilson et al., 2019). There are significant disparities in mathematics performance across social categories and ability levels, which highlight the need for tailored strategies to ensure equal educational rights for all students, particularly those with SEN (Schnepel, 2020). Inclusive mathematics education helps students with specific SEN through its structure of equality and simultaneously promotes productive mathematics teaching practices that assist all students. Ultimately, such commitment upholds the education rights of all, regardless of ability. Lindenskov and Lindhardt (2020) suggest ongoing professional development programmes for the educators emphasising or directing them toward methodological development along with intervention strategies for the implementation of inclusive mathematics education as quality assurance in education.

Literature Review

Over the past few decades, inclusive mathematics education has emerged as a strong field of research in mathematics education. Rodd (2006) investigated the learning of mathematics in students with special educational needs (SEN) that also provided a theoretical underpinning designed to inform research directed at individualising methods of teaching. A study by Bishara (2015) found that when students with SEN received differentiated mathematics instruction based on their learning styles, they demonstrated notable improvements in their mathematics performance. In Lin and Jiar's (2017) experiment, the teacher used visual and auditory materials as well as kineasthetic activities in the teaching session of students with dyscalculia. Using this method, students have a great understanding of the basics of math concepts, obtaining an average score of 9.78, compared to when they only reached 0.50 before the method, according to the results presented in this study. Daroni et al. (2019) encouraged the use of assistive technology devices and the use of visual support tools was recommended as the overall understanding of mathematics improved in students with visual impairment. In addition, the two studies also emphasise the variability of disability as a type of lack and which needs to be considered for different types of disabilities, suggesting a need for flexible and customised teaching strategies in mathematics study.

Healy et al. (2010) explore research on inclusive math education and technology context when evaluating adaptive learning technologies. The research showed that adaptive technology when designed for student needs together with teamwork approaches, creates better mathematics results and student interest. Omoush et al. (2023) emphasized the pivotal role that governments, educational institutions, technology, developers, and communities play in effectively integrating technology into inclusive mathematics education. Based on this insight Khoirunnisya et al. (2024) demonstrate that VR and game-based learning have the

potential to support the mathematics education of students with special educational needs by enabling the construction of different relevant contexts and allowing for an intentional tactile exploration of themes and concept building through immersive experiences which account for individual learning profiles.

Research by Büscher and Prediger (2022) provides strong support for the idea of teacher support beyond the professional development they receive. However, it was found that focused, specialised training specific teacher education opportunities in this area promoted teachers to teach students with special educational needs confidently and effectively in the mathematics inclusion setting. Flood and Logan (2024) demonstrated that improved student learning in inclusive mathematics classrooms in which teachers were trained, compared to similar classes that were not experiencing teacher education. As professional development helps teachers to strengthen their professional knowledge and to enhance their professional skills and experience concerning practices in order to help enhance the quality of mathematical learning for all learners.

Response to Intervention (RTI) model is defined as a specific intervention approach in a framework proposed by Fuchs and Fuchs (2006) under IDEA 2004 for students with special educational needs. It allows students to receive early intervention and is step-based into supportive measures, which helps to facilitate instructional adaptation depending on students' needs. Building on this, several studies have been conducted to examine the adaptation of this model in inclusive mathematics teaching, such as the research by Daniel and Alberto (2022). The RTI model demonstrates not only its effectiveness but also provides a clear picture of exactly how the RTI model identifies where students are mathematically in a way that is timely enough to create appropriate learning interventions before there is a serious, math-based problem.

Recent work in inclusion provided findings exploring how the Universal Design for Learning (UDL) framework can assist in mathematics instruction growth (Root et al.,2021). That approach recognises that accessibility and flexibility help all students. When applied correctly and effectively, we can see that the UDL strategy helps the students with special needs but also creates an environment that is beneficial to all learners in the classroom. According to Opitz et al. (2018) students with better computation abilities received greater benefits from working in groups compared to other students who did not participate in collaborative learning programs. Multiple research findings validate that student collaborative approaches boost math achievement in students with special educational needs (Pratama et al., 2019; Ellala & Alslaq, 2017). Collaborative/team-based learning results in multiple benefits not only as it generates academic spirit among the students but also because it makes room for interested procedures and equips students with problem-solving techniques moreover improving concentration ability for learners with special needs (Elkhateeb & Elhadeddy, 2011; Alsefy, 2009).

The early mathematics intervention programmes designed for preschool children with special educational needs serve as fundamental methods to boost their early numeracy skills according to Yazicioğlu and Akdal (2023). The intervention programmes include numbered activities that build up from counting to numbers to operations to shapes to measurement to patterns. These activities support each other as basic elements. Kumaş and Ergül (2021) ran

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the "Big Math for Little Kids" program on at-risk children which yielded successful results in improving their mathematical skills. According to Aunio et al. (2020) first-grade pupils in South Africa who may struggle with math development require basic numeracy proficiency based on their research data. Early mathematics intervention programmes supply essential developmental assistance to children with special educational needs for their early mathematics capabilities

Although the field of inclusive mathematics education has shown promising progress in recent years, there are still significant research gaps that need to be addressed. There is a need for in-depth systematic literature reviews (SLR) and bibliometric analysis of strategies and interventions in inclusive mathematics instruction to better understand the trends, patterns, and effectiveness of various approaches used to date. Research currently lacks investigations concerning the specific adaptation of inclusive mathematics methods for various special needs categories, which include learning disabilities alongside autism spectrum conditions, along with auditory disabilities and visual impairments, and other disabilities under special educational needs standards. A significant research gap exists about assistive technology effectiveness coupled with digital tools towards supporting mathematics learning among students with special educational needs in inclusive education spaces, as well as evaluations of bespoke software designed for those unique educational needs. A systematic review implementation is essential for analysing empirical evidence about different strategies and assistive tools to develop evidence-based best practices for inclusive mathematics education.

Research Objectives

The main objective of this study is to conduct a systematic literature review and bibliometric analysis on strategies and interventions in inclusive mathematics education for students with special educational needs in schools. The following research questions will guide the exploration:

- What strategies and interventions have been used in inclusive mathematics education for students with special educational needs based on recent studies?
- What are the research trends in the field of inclusive mathematics education through bibliometric approaches, including publication trends, author collaborations, and the influence of key journals?

Methodology

Systematic Literature Review

The study analyses publications sourced from Scopus and Web of Science (WOS) databases, in line with the research by Pranckutė (2021), which found that these two databases are the most comprehensive sources for publication metadata and impact indicators. The following syntax with keywords was used:

(("Strateg*" OR "Intervention*") AND ("Mathematic* Education" OR "Math Instruction" OR "Teaching Mathematic*") AND ("Inclusive Education" OR "Inclusion" OR "Special Educational Need*" OR "Student* with Disabilit*").

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Table 1		
Selection Criteria		
Criterion	Details	
Year	2019-2025	
Language	English	
Document Type	Journal Articles	

Search Strategy

Web of Science (WOS) and SCOPUS were the two databases used to search for articles for this SLR and bibliometric study. The search was conducted using specific keywords. The keywords "Strategy or Intervention" and "Mathematics Education" or "Math Instruction" or "Special Education" were used in SCOPUS and WOS to search for articles. The purpose of these keyword settings was to ensure the search focused specifically on Inclusive Mathematics Education for students with Special Educational Needs. The PRISMA flowchart shown in Figure 1 summarises the article selection process. The title and abstract of each selected article were reviewed specifically to ensure the selection criteria were met. The PRISMA guidelines consist of four stages: identification, screening, eligibility, and inclusion.





Acceptance and Rejection Criteria

Criteria such as publication year, language, field of study, type of reference material, and research methodology were established to search for articles that meet the criteria in the database for article selection criteria. The year criterion was set for the six most recent years, from 2019 to 2024. This ensures that journal articles discuss current issues about inclusive mathematics education for students with special educational needs only. In addition, articles in the form of SLR, proceedings books, and theses were rejected, and only empirical articles were selected for this study. All selected articles are in English. The field of study selected for this research is mathematics. Table 2 shows the selection and rejection criteria of journal articles for this study.

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Criteria	Acceptance	Rejection
Publication Year	2019-2024	Publications before 2019
Type of Reference	Empirical Articles	Theses, Books, Proceedings
Language	English	Languages other than English
Approach	Qualitative, Quantitative, Mixed	SLR
Field of Study	Mathematics	Other fields
Access	Open Access	Paid Access

Table 2

Criteria of Acceptance and Rejection	

As many as 227 journal articles were excluded because they did not meet the acceptance criteria. The systematic review study was conducted by examining titles, abstracts, and full articles. A total of 16 journal articles were selected to align with the purpose of this study.

Data Analysis Method

This research uses a combined bibliometric and SLR approach, similar to the method used by Syed Ismail et al. (2024). Bibliometrics is used to examine publication patterns in literature groups, including global longitudinal trends and the impact of research papers based on references. Topic trend analysis and thematic mapping provide direction for future research and development (Muhamad & Ingo, 2024). A systematic literature review is an in-depth analysis that helps build new knowledge and formulate quality research questions (Digrande, 2024). In this study, bibliometric analysis is used to examine the field of study in question, which is then strengthened by content analysis focusing on key themes.

To achieve this goal, the VOSviewer application was used. This software produces visualisations that depict relationships between elements using the "visualisation of similarities" (VOS) technique. VOSviewer was specifically applied to analyse citations, cocitations, and keywords. A total of 52 articles were processed using VOSviewer, with methodology as illustrated in Figure 2



Figure 2: Data analysis method

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Research Findings

Systematic Literature Review

This Systematic Literature Review was conducted to identify strategies and interventions that have been used in inclusive mathematics education for students with special educational needs based on recent studies. There are 16 articles that met all the established criteria. The focus is on three main themes identified in the literature: pedagogical approaches, use of technology and resources, and teacher assistance and support as shown in Table 3.

Table 3

Strategies and Interventions for Inclusive Mathematics Education

No	Strategies and Interventions for Inclusive Mathematics Education		Author Names
1.	Pedagogical approaches	 Differentiated approach Self-regulation strategies Modified explicit instruction 	Rizos et al., 2024 Bundock et al., 2023 Demo et al., 2021 Bouck & Long, 2021 Lambert & Schuck, 2021 Ahmed & Ibrahim, 2023 Ogut et al., 2024
2.	Use of technology and resources	 Technology such as video and AR Hands-on engagement such as touch point strategy 	Alghamdi, 2024 Hayes & Proulx, 2023 Kellems et al., 2019 Bouck et al., 2022 Edwards et al., 2020 Yakuboya et al., 2019
3.	Teacher assistance and support	 Guidance and mentoring 	Kivirähk & Kiive, 2022 Güven et al., 2021 Lindenskov & Lindhardt, 2019

From the results of this review, it was found that 7 articles used various pedagogical approaches as teaching and learning strategies for inclusive groups in mathematics education. Furthermore, six articles utilised the latest technological facilities and practicality in attracting students' interest in abstract mathematical concepts. Teacher assistance and support were also strategies used by the remaining three articles, where teachers guide and provide direction to inclusive students in the mathematics learning process at school.

Publication Year



Figure 3: Publication Year

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This study involves articles published from 2019 to 2024. As seen in Figure 3, the publication pattern for articles related to what has been used in inclusive mathematics education for students with special educational needs from 2019 to 2024 is uneven. Publication of related articles was lowest in 2021 with only 4 articles. A significant increase in article publications occurred from 2021 to 2022, with an increase from only 4 articles in 2021 to 11 articles in 2022. This is because previous research related to inclusive mathematics education had not yet successfully resolved emerging issues, for example regarding strategies or interventions needed in inclusive mathematics education (Melissa, 2023). However, there was a slight decrease in publications in 2023, but the decrease was not significant. The highest number of publications was in 2024 with 13 articles, as researchers began to realise that research on strategies and interventions in inclusive mathematics education needs to be intensified (Boateng, 2024).

Authors, Institutions, and Countries with the Greatest Contributions

No.	Main Author	Number of Articles	Main Institution	Main Country
1	Bouck, Emily C	6	Michigan State University	USA
2	Long, Holly M	3	Saginaw Valley State University	USA
3	Gebhardt, M	2	University of Munich (LMU)	Jerman
4	Kellems, Ryan O	2	Brigham Young University	USA
5	Osborne, Kaitlyn	2	Brigham Young University	USA
6	Satsangi, Rajiv	2	George Mason University	USA
7	Adamuz-Povedano, Natividad	1	Universidad de Cordoba	Sepanyol
8	Ahmed, Aisha	1	Altinbas University	Turki
9	Alhwaiti, Mohammed M.	1	Umm Al Qura University	Saudi Arabia
10	Bagger, Anette	1	Dalarna University	Sweden

Table 4

Authors. Institutions and Countries

Based on the data shown in Table 4 above, a total of 10 main authors from different institutions and countries have contributed to research in this field. Emily C Bouck from Michigan State University, USA leads with 6 articles, followed by Holly M Long from Saginaw Valley State University, USA with 3 articles. Gebhardt, M, from the University of Munich, Germany, Ryan O Kellems and Kaitlyn Osborne (both from Brigham Young University, USA), and Rajiv Satsangi from George Mason University, USA each published 2 articles.Other authors who also contributed with one article each are Natividad Adamuz-Povedano, who serves at Universidad de Cordoba, Spain, Aisha Ahmed from Altinbas University, Turkey, Mohammed M. Alhwaiti from Saudi Arabia, and Anette Bagger from Sweden. The international scope of inclusive mathematics research is demonstrated by the institutions and countries involved. The field of inclusive mathematics research contains institutions in Europe and Western Asia that unite their efforts. The research collaboration extends across continents and cultures through studies demonstrated in this article.

In terms of institutions, universities from the USA dominate this list with five different institutions. These are followed by institutions from European countries (Germany, Spain, Sweden) and Western Asia (Turkey, Saudi Arabia). In conclusion, this data shows that the USA

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has the most contributors in this field, with diverse contributions from other countries around the world. This reflects a global research pattern that has a strong focus in the United States while maintaining significant international participation.

Publication Channels

Table 5 shows a summary of 10 publication channels that publish articles on strategies and interventions in inclusive mathematics education. It can be seen from Table 5 that Education Sciences and ZDM Mathematics Education published 3 articles each regarding strategies and interventions in inclusive mathematics education from 2019 to 2024. Next, *Educational Studies in Mathematics, International Journal of Disability Development and Education,* and *Journal of Behavioural Education* published 2 articles each throughout 2019 to 2024. Furthermore, other channels published 1 article each related to the topic. Overall, studies on strategies and interventions in inclusive mathematics education need to be intensified.

Table 5

Publication	Channels	that	Published Art	icles
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Publication Channels	Number of Articles
Education Sciences	3
ZDM Mathematics Education	3
Educational Studies In Mathematics	2
International Journal Of Disability Development and Education	2
Journal of Behavioural Education	2
African Journal Of Research In Mathematics Sciences and Technology Educa	1
Asia Pacific Education Researcher	1
Assistive Technology To Support Inclusive Education	1
Ankara Universitesi Egitim Bilimleri Fakultesi Ozel Egitim Dergisi Ankara	1
University Faculty Of Educational Sciences Journal Of Education Sciences	
Journal Of Special Education	
Behaviour Information Technology	1



Figure 4: Publication Channels

It can be seen from Figure 4 that the field of inclusive mathematics education is not limited to special education alone. Inclusive mathematics education is a field that involves various educational disciplines such as rehabilitation, scientific education disciplines, and others. However, studies related to inclusive mathematics education are still not widespread in other fields such as ethics studies, ergonomics, computer science, and the humanities.

Keyword Analysis



Figure 5: Keyword Analysis

Sezer et al. (2022) state that through proper keyword selection and references, the retrievability of their work can be enhanced, ensuring that research users obtain relevant information. Through the VOS viewer application, analysis was conducted to determine the dominant themes in the field of mathematics education learning. The analysis showed 44 keywords that should be given attention across 52 articles, with each keyword appearing at least 3 times. Table 6 lists the top keywords in mathematics education research. The most frequently used keywords are "students" and "mathematics," each appearing 13 times, indicating that they are the main concepts in inclusive mathematics education. Other keywords used include "mathematics education" (12 times), "children" (10 times), "achievement," "instruction," and "education" (7 times), "skills" and "inclusive education" (6 times), "performance," "learning disabilities," "inclusion," "intellectual disabilities," and "meta-analysis" (5 times). The analysis also shows various themes in inclusive mathematics education. The focus on "students" and "mathematics" indicates a relationship between "learning disabilities" and "mathematics" indicates a relationship between "learning disabilities" and "mathematics" indicates a relationship between "learning disabilities" and "mathematics" thinking (Che Rod & Musa, 2015).

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Table 6

Frequency of Keywords in Inclusive N	Aathematics Education Research
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Keywords	Frequency
Students	13
Mathematics	13
Mathematics Education	12
Children	10
Achievement	7
Instruction	7
Secondary Students	5
Education	7
Performance	5
Skills	6
Learning Disability	5
Meta-analysis	5
Teaching Mathematics	4
Intervention	4
Inclusive Education	6
Math	5
Interventions	4
Metaanalysis	3

Table 6 shows that the keywords "students" and "mathematics" are closely related to terms such as "mathematics education" and "children". The keyword network of "students" also connects to "school", "achievement", and "children", indicating the main factors that influence students' academic achievement, namely students, teachers, and schools (Jia Chin & Surat, 2021). The keyword cluster of "skills", "intervention", and "teaching mathematics" also emphasizes the role of all parties in prioritizing the implementation of inclusive education in schools (Jalaluddin & Tahar, 2022).

Reference Network Analysis



Figure 6: Reference Network Analysis

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The number of citations serves as an indicator of how many times an article has been referenced by year. Articles that receive a high number of citations are seen as having more impact and significance compared to articles with fewer citations. The study relied on a citation network containing 52 articles to establish what articles had the greatest research impact in inclusive education. Research has used the 52 identified articles within this network for documentation purposes.

Cite Reference	Citations	
Gersten, R. (2009)	7	
Wex, X. (2013)	6	
Agrawal, J. (2016)	5	
Bouck, E. (2017)	5	
Bouck, E.C. (2018a)	5	
Bouck, E.C. (2017)	4	
Spooner, F. (2019)	4	
Bouck, E.C. (2018b)	4	
Yakubova, G. (2016)	4	
Powell, S.R. (2015)	4	
Horner, R.H. (2005)	4	
Peltier, C. (2020)	3	
Satsangi, R. (2017)	3	
Bottge, B.A. (2002)	3	
Hudson, P. (2006)	3	
Maccani, P. (2000)	3	
White, O.R. (1980)	3	
Root, J.R. (2017)	3	

Table 7 Highest cited articles

Table 7 shows the top 20 articles on inclusive mathematics education based on citation frequency. Citations refer to how often an article has been cited by other papers within this specific network of 52 articles. According to the citations, Gersten, R. (2009) is at the top with 7 citations, followed by Wex, X. (2013) with 6 citations. Next, Agrawal, J. (2016), Bouck, E.C. (2017), and Bouck, E.C. (2018a) received 5 citations each. Meanwhile, Bouck E. received 4 citations for 3 articles written in different years, namely 2017 and 2018. Spooner, F. (2019), Yakubova, G. (2016), Power, S.R. (2015), and Horner, R.H. (2005) also received 4 citations each. Additionally, Peltier, C. (2020), Satsangi, R. (2017), Bottge, B.A. (2002), Hudson, P. (2006), Maccani, P. (2000), White, O.R. (1980), and Root, J.R. (2017) received at least 3 citations each. In the context of inclusive education research, articles that obtain a high number of local citations are considered highly influential. Gestern, R. (2009) and Wex, X. (2013) consistently make significant contributions to the field of research. This research encompasses inclusive mathematics education covering affective and psychomotor domains. The research and educational practices thereafter received important advances through these crucial additions which provided complete clarity about inclusive mathematics education for students with special educational needs as well as teaching strategies for educator support.

Discussion

Based on the systematic and bibliometric analysis conducted, several important themes and patterns have been identified in the field of inclusive mathematics education. Analysing each available article according to the selection criteria has enhanced our understanding of the research field landscape in this field. Research on inclusive mathematics instruction reveals three primary elements: pedagogical approaches, use of technology and resources, and teacher assistance and support in inclusive mathematics education. Pedagogical approaches play an important role in ensuring the effectiveness of inclusive mathematics education. According to Cultural Historical Activity Theory Nicholson (2023) describes pedagogical approaches as tools that work within teaching activities through subject, object, rules, community, and division of labour.

Among the approaches that can be identified is differentiated instruction, which emphasizes adapting content, process, and learning outcomes according to individual student needs. This teaching approach enables students with various ability levels—from gifted students to those with mild or even severe disabilities—to receive appropriate education in an inclusive classroom (Tieso 2005; Lawrence-Brown 2004). The basic difficulty in teaching mathematics to children is not because they are not sufficiently mentally developed or unwilling to learn, but rather because their exploratory behaviour is not yet adequately developed (Sabirova et al.,2020). According to the same source, children cannot sit still in class; they are easily distracted, whereas learning mathematics requires a strong focus on the subject. Therefore, self-regulation strategies are often practised in mathematics teaching and learning sessions for inclusive students, as in the study by Lambert and Schuck (2021) where self-regulation is synonymous with students' motivation levels.

The second theme for this review is the use of technology and resources in the classroom for teaching mathematics to inclusive students, especially those with visual impairments. This aligns with research from Omoush et al. (2023) which found that assistive technology (AT) greatly helps the learning process for students with special needs. The study by Kellems et al. (2019) shows that Augmented Reality (AR) serves as a video-based strategy with success potential for teaching mathematical skills to students with disabilities. Teachers use technology to deliver quality instruction for students who have mathematics-related disabilities. Technology equipped with artificial intelligence (AI) operates as a personal tutor system which delivers instant feedback to students while they work on mathematical problems according to Alam (2021). The research conducted by Alam (2021) indicates AIEd platforms analyse significant educational datasets for learning pattern identification while developing instructional planning strategies.

Under this second theme as well, hands-on student engagement strategies are practised by teachers when teaching mathematics to inclusive students (Alghamdi 2024; Hayes & Proulx 2023). Hands-on engagement is a learning approach that emphasises physical interaction and direct experience in understanding mathematical concepts. This is because, according to Sahin and Yorek (2009), the abstract and visual concepts in mathematics and science curricula traditionally make these subjects difficult for students with visual impairments. Therefore, hands-on engagement has been found to be very effective for inclusive students, as in the study by Hayes and Proulx (2023). Alghamdi (2024) used a touchpoint strategy for addition operations in autism classes, and the result was a significant improvement among the study

participants. This shows that student involvement in practical learning can add positive experiences to their mathematics learning.

For the final theme in this review, Kivirähk and Kiive (2022) report that special school students are more enthusiastic about using teacher assistance and support tools when solving mathematical problems. Undeniably, teachers play an important role in supporting inclusive students so they can access and understand mathematical concepts more effectively. For example, research by Güven et al. (2021) found that teachers who teach students with hearing impairments use more delivery methods such as talking, writing, drawing shapes, and signalling, compared to teachers who teach students with learning difficulties.

The bibliometric analysis shows a significant increase in publications related to inclusive mathematics education from 2021 to 2024, with the highest spike in 2024 (13 articles). This increase reflects growing awareness of the importance of inclusive education and the need for effective teaching strategies. The findings from Boateng (2024) align with this data pattern, which reveals the increased importance of researching inclusive mathematics education strategies as an intervention. The research field of educational inclusivity has produced successful articles through multiple publication channels. The study analysis demonstrates that research publication distribution is unbalanced and the number of articles about strategies and interventions in inclusive mathematics education requires further increase. This statement is supported by Nafisah et al. (2021) who believe that studies on strategies or interventions in handling inclusive mathematics education need special attention and should be intensified to ensure the effectiveness of education for every student. Inclusive mathematics education maintains equal educational rights in all circumstances without discrimination based on student background or ability. Educational institutions could publish inclusive mathematics educational research which provides instructive references for teaching professionals (Maimunah, 2021). The study reveals that inclusive education extends beyond individual disciplines since it combines education with practices from ergonomics along with special education and computer science and scientific education and ethnicity and humanities fields.

Geographically the United States stands as the primary contributor according to this research as Emily C. Bouck from Michigan State University takes a leading position among the mentioned scholars. Educational institutions ranging from Europe to West Asia display an expansion of global reach in this field. This pattern illustrates both the worldwide extent of inclusive mathematics educational challenges and the importance of cultural-based solutions which allow each region to supply multiple approaches to education and respective education systems. Recent studies show that inclusive mathematics education requires the integration of international perspectives encompassing technological innovations (Hayes & Proulx. 2023), robust pedagogical frameworks (Güven et al., 2021), and culturally sensitive approaches (Ellis, 2019). The wide range of objectives demonstrates why we need an all-encompassing system of inclusive mathematics teaching which interacts with community requirements and worldwide academic criteria.

Research performed by VOS reveals that mathematics education has a close connection with inclusive education and signifies the collective importance of these disciplines. Interestingly, dominant keywords such as "mathematics education," "inclusive education," and "learning"

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disabilities" form the main core in research mapping, showing a consistent focus on core issues in inclusive education. Other keywords such as "intervention," "skills," "performance," and "instruction" illustrate important elements that complement this study, indicating that specific techniques and approaches can improve mathematics achievement for students with special needs. This finding supports Liang Soon & Anak Day (2024), who discovered mainstream teachers possess high levels of readiness for implementing inclusive education through knowledge acquisition and skills mastery. The research field demonstrates maturity through this keyword connection system because it selects fundamental components between pedagogy and learning support models, similar to conclusions in Güven et al.'s (2021) research about educational integration principles. Technology exists within keyword analysis, yet it does not represent the principal focus, which indicates that educators prioritise foundational pedagogical teaching practices above technology use in their research.

Studies in inclusive mathematics education show strong research connections as researchers mainly focus on developing effective teaching methods and universal learning techniques. Inclusive mathematics education research has reached a mature phase because researchers build new knowledge through their extensive research connections. The analysis found that Gersten (2009) obtained the highest number of citations with 7 citations, indicating the significant influence of this study in the field. Studies which encompass multiple aspects of inclusive education receive high frequencies of citations because they demonstrate the importance of using a comprehensive approach in this field. These findings align with Lindenskov and Lindhardt's (2020) recommendations regarding the need to integrate various teaching dimensions in supporting inclusive mathematics learning, especially in different sociocultural contexts. This approach opens up space for innovation in inclusive mathematics education that is more responsive to the diversity of learning contexts.

Limitations of the Study

Although this study is to provide a systematic overview of strategies and interventions in the field of inclusive mathematics education, there are some limitations to be considered when interpreting the evidence. First, being based on a relatively short time span 2019-2024, it may limit understanding of long-term evolution in this field, especially when it concerns enabling policy-making changes for inclusive education, as they often require time until impact becomes visible. Moreover, conducting bibliometric analyses based only on the Web of Science database has left out relevant studies published in the Scopus journals, or journals not indexed in either database. That includes high-impact research published from other countries.

Because of these limitations, some future research implications can be derived to continue advancing inclusive mathematics education in the field. For temporal domain, future research should cover a lengthier span from 10 to 15 years to add, detail and describe the historical evolution of strategies and interventions used in inclusive mathematics education. This long-term research is important for evaluating the impact of inclusive education policy changes and how they influence mathematics teaching practices at the school level. Moreover, and with the aim to complete the scope of the research in this field, future research may do well to conduct the searches for bibliometric analysis over several pedagogical databases (e.g., Scopus, ERIC, and others) in addition to the Web of Science. Such an approach can enable the harvesting of research across different lenses and cultural contexts including research from

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the developing world which may point to novel models of mathematics education that are more inclusive and responsive to local needs and challenges.

Conclusion

This systematic review and bibliometric analysis have provided a comprehensive examination of research developments in inclusive mathematics education for students with special needs during the most recent five-year period. By employing publication pattern analysis as well as studies on intellectual relationships, this research illustrates an up-to-date perspective of the ongoing research landscape, as well as some of the main research topics within this area. The results shed light on three key areas of focus that underpinned objectivity and practices within respective fields: pedagogical approaches, technology integration, and teacher support strategies, all of which contribute to a deeper understanding of effective practices in inclusive mathematics education.

The ramifications of this research for many actors in the education system are considerable. The empirical evidence these findings provide can serve policymakers well in developing tailored inclusionary educational strategies especially when developing guidelines tailor made for the diverse needs of students with effective instructional practices. This type of evidence can also help guide policymakers in allocating resources more strategically to promote supportive mathematics practices, such as providing funding for assistive technology and learning materials. It also offers practical advice for adjusting teaching methods that are appropriate for a range of student needs. But one weapon they may reach for is research: There are many tried-and-tested methods of best practice (differentiated instruction, technology-enabled learning et al) which help educators work out what will be effective, but these should not be seen as "one-size-fits-all" templates, but rather applied to specific contexts and students. Concurrent with this, these findings serve as a message to educators about the need for dynamic assessment and adjustment in teaching approaches that accurately meet the needs and development of students.

The findings of this study contribute substantially theoretically by drawing from several theoretical frameworks observed in inclusive mathematics education, such as Universal Design for Learning (UDL) and Response to Intervention (RTI) approaches outlined in our literature review. On paper, our findings fill a gap between the general theories of education and the special inclusive education sessions, with emphasis on the three pinpointed main teaching strategies: (1) pedagogical diversity, (2) technology integration, and (3) teacher support. In terms of context, this research is very valuable for educational practice in various contexts. By analysing systematic global research trends to determine these three core teaching strategies, our study provides evidence-based guidance to teachers, school administrators, and policy makers seeking to implement an effective inclusive mathematics curriculum. The bibliometric mapping shows changing priorities of research that could correspond with global educational endeavours such as the UN Sustainable Development Goal 4 and the Salamanca Declaration, where inclusive mathematics education is a game changer when it comes to larger social inclusion. In addition, our findings offer a blueprint for the inclusion of these evidence-based strategies into teacher education programmes to be used in teacher professional capital building, which may radically change the way mathematics is taught to diverse learners in mainstream classrooms all over the world.

Despite limitations in terms of time scope and database coverage, this study has opened space for more in-depth and comprehensive future research. The need for longitudinal studies and the use of more diverse databases will help further strengthen our understanding of the effectiveness of various strategies and interventions in inclusive mathematics education.

References

- Ahmad, N. F., Ahmad, H., Ahmad Tarmizi, U. H., Sutrisno, E. M., Abd Razak, N. N., Mohamad Zamri, N. A. S., Abdullah Sani, N. E., Matali, N. F., Peturus, N., Abdul Taib, M. N., & Ngah, A. A. (2024). Tahap pengetahuan pelajar Ijazah Sarjana Muda Pendidikan UPSI terhadap program-program untuk Murid Berkeperluan Pendidikan Khas. *Jurnal Pendidikan Bitara UPSI*, *17*(1), 94–105. https://doi.org/10.37134/bitara.vol17.1.9.2024
- Ahmed, A., & Ibrahim, A. A. (2023). The Effectiveness of Adaptive Learning Methods in Mathematics Compared to Flipped Learning analyzed by ANN and IoT. Wireless Personal Communications. https://doi.org/10.1007/s11277-023-10500-6
- Alam, A. (2021). Possibilities and Apprehensions in the Landscape of Artificial Intelligence in Education. In International Conference on Computational Intelligence and Computing Applications (ICCICA): 1-8. https://doi.org/10.1109/iccica52458.2021.9697272
- Alghamdi, A. S. (2024). Evidence-based practices: using the touch points strategy to teach single-digit addition to students with ASD. *Humanities and Social Sciences Communications*, *11*(1). https://doi.org/10.1057/s41599-023-02460-w
- Alsefy, A. (2009). *The teacher and modern learning strategies (1st ed.).* Jordan: Dar Osama For Publishing & Distribution
- Aunio, P., Korhonen, J., Ragpot, L., Törmänen, M., & Henning, E. (2020). An early numeracy intervention for first graders at risk for mathematical learning difficulties. *Early Childhood Research Quarterly*, 55, 252–262. https://doi.org/10.1016/j.ecresq.2020.12.002
- Barbora Vodičková, Mitašíková, P., & Mária Slavíčková. (2023). Supportive Factors in Inclusive Mathematics Education: Mathematics Teachers' Perspective. *Education Sciences*, *13*(5), 465–465. https://doi.org/10.3390/educsci13050465
- Bishara, S. (2015). Active and traditional teaching of mathematics in special education. *Creative Education*, 06(22), 2313–2324. https://doi.org/10.4236/ce.2015.622238
- Boateng, F. (2024). A Systematic Review of mathematics interventions for primary school students without identified disability. *International Journal of Education and Research*, 12(5): 105-124.
- Bouck, E. C., & Long, H. (2021). Online delivery of a Manipulative-Based Intervention Package for finding equivalent fractions. *Journal of Behavioral Education*, *32*(2), 313–333. https://doi.org/10.1007/s10864-021-09449-y
- Bouck, E., Long, H., & Jakubow, L. (2022). Teaching Division Online to Students via a Virtual Manipulative Instructional Sequence. *Education and Training in Autism and Developmental Disabilities*, *57*(1), 16–30. https://www.jstor.org/stable/27120642
- Bundock, K., Rolf, K., Hornberger, A., & Halliday, C. (2023). Improving access to general education via Co-Teaching in secondary mathematics classrooms: an evaluation of Utah's professional development initiative. *Rural Special Education Quarterly*, 42(2), 78– 93. https://doi.org/10.1177/87568705231167340

- Büscher, C., & Prediger, S. (2022). Teachers' practices of integrating challenging demands of inclusive mathematics education in a professional development program. *Journal of Mathematics Teacher Education*. https://doi.org/10.1007/s10857-022-09560-5
- Daniel Tomo, C., & Alberto Sitoe, A. (2022). Response to Intervention Model as a Tool for Fostering Inclusive Education in Unprivileged Contexts: A Pioneering Case Study in Mozambique. American Journal of Applied Psychology, 11(2), 74. https://doi.org/10.11648/j.ajap.20221102.15
- Daroni, G. A., Gunarhadi, G., & Legowo, E. (2018). Assistive technology in Mathematics learning for visually Impaired students. *Tadris Jurnal Keguruan Dan Ilmu Tarbiyah*, *3*(1), 1. https://doi.org/10.24042/tadris.v3i1.2406
- Demo, H., Garzetti, M., Santi, G., & Tarini, G. (2021). Learning Mathematics in an inclusive and open environment: an interdisciplinary approach. *Education Sciences*, *11*(5), 199. https://doi.org/10.3390/educsci11050199
- Digrande, L. (2024). Embracing Systematic Literature Reviews in Education Research: A Path to Rigorous Discovery - Center for Engaged Learning. *Center for Engaged Learning*. https://www.centerforengagedlearning.org/embracing-systematic-literature-reviewsin-education-research-a-path-to-rigorous-discovery/
- Edwards, S. E., Kellems, R. O., Gibb, G. S., Ashbaker, B. Y., Osborne, K., & Wheatley, A. W. (2020). Using video prompting to teach mathematics to adolescent students with LD. *Technology and Disability*, *32*(4), 229–241. https://doi.org/10.3233/tad-200298
- Elkhateeb, J. & Elhadedy, M. (2011). *Strategies of teaching students with special needs*. Jordan: Dar Elfekr.
- Ellala, Z., & Alslaq, M. (2017). The Impact of Using Cooperative Learning Strategy on Achievement of Students with Math Learning Disabilities. *American Journal of Educational Research*, 5(6), 612–619. https://doi.org/10.12691/education-5-6-3
- Ellis, M. (2019). *Culturally Responsive Mathematics Teaching*. Curriculum Associates LLC.
- Flood, M., & Logan, A. (2024). The Outcomes of Collaborative Whole-School Professional Development on Teachers' Inclusive Practices in a Mainstream Secondary School. International Journal of Teacher Education and Professional Development, 7(1), 1–19. https://doi.org/10.4018/ijtepd.341267
- Fuchs, D., & Fuchs, L. S. (2006). Introduction to response to intervention: What, why, and how valid is it? *Reading Research Quarterly*, *41*(1), 93–99. https://doi.org/10.1598/rrq.41.1.4
- Guven, D., Gürefe, N., & Arıkan, A. (2021). Inclusive Pedagogical Content Knowledge of Mathematics Teachers: Learning Disabilities vs. Hearing Impairments. International Journal of Disability Development and Education, 69(1), 15–32. https://doi.org/10.1080/1034912x.2021.2011155
- Hayes, C., & Proulx, M. J. (2023). Turning a blind eye? Removing barriers to science and mathematics education for students with visual impairments. *British Journal of Visual Impairment*, 42(2), 544–556. https://doi.org/10.1177/02646196221149561
- Healy, L., Jahn, A. P., & Frant, J. B. (2010). Digital technologies and the challenge of constructing an inclusive school mathematics. *ZDM*, 42(3–4), 393–404. https://doi.org/10.1007/s11858-010-0252
- Hisam, N. A. B. B., & Khairuddin, K. F. (2022). Pendidikan Inklusif Murid Berkeperluan Khas Kategori Autisme di Sekolah Rendah: Perspektif Ibu Bapa. *Malaysian Journal of Social Sciences and Humanities (MJSSH), 7*(2), e001286. https://doi.org/10.47405/mjssh.v7i2.1286

- Jalaluddin, N. S., & Tahar, M. M. (2022). Pelaksanaan Pendidikan Inklusif dalam kalangan Guru Arus Perdana. *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, 7(2), e001280. https://doi.org/10.47405/mjssh.v7i2.1280
- Jia Chzin, D., and Surat, S. (2021). "Sorotan Literatur Bersistematik : Faktor-Faktor Mempengaruhi Pencapaian Akademik Pelajar". *Malaysian Journal of Social Sciences and Humanities (MJSSH)*, 6(12): 137 - 157. doi: 10.47405/mjssh.v6i12.1210.
- Kellems, R. O., Cacciatore, G., & Osborne, K. (2019). Using an Augmented Reality–Based teaching strategy to teach mathematics to secondary students with disabilities. *Career Development and Transition for Exceptional Individuals, 42*(4), 253–258. https://doi.org/10.1177/2165143418822800
- Khoirunnisya, M., Anwar, L., & Kusumasari, V. (2024). The Use of Game-Based Learning Media to Support Students' Cognitive Abilities in Mathematics. Mathline : *Jurnal Matematika Dan Pendidikan Matematika, 9*(2), 559–574. https://doi.org/10.31943/mathline.v9i2.654
- Kivirähk, T., & Kiive, E. (2022). Cognitive factors and educational placement affecting mathematical attainment in middle school students with mild intellectual disability. *International Journal of Developmental Disabilities*, 70(3), 493–506. https://doi.org/10.1080/20473869.2022.2106534
- Kumaş, Ö. A., & Ergül, C. (2021). Effectiveness of the Big Math for Little Kids Program on the Early Mathematics Skills of Children with Risk Group. *Athens Journal of Education*, 8(4), 385–400. https://doi.org/10.30958/aje.8-4-3
- Lambert, R., & Schuck, R. (2021). "The Wall Now Between Us": Teaching Math to Students with Disabilities During the COVID Spring of 2020. *The Asia-Pacific Education Researcher*, 30(3), 289–298. https://doi.org/10.1007/s40299-021-00568-8
- Lawrence-Brown D. (2004). Differentiated instruction: Inclusive strategies for standardsbased learning that benefit the whole class, *American Secondary Education*, 32(3), 34.
- Liang Soon, V. K. & Anak Day, S. A. D. (2024). Kesediaan Guru Arus Perdana dalam Pelaksanaan Pendidikan Inklusif di Sebuah Sekolah Rendah di Daerah Kanowit. *International Journal of Advanced Research in Future Ready Learning and Education, 34*(1), 104–112. https://doi.org/10.37934/sijile.34.1.104112
- Lin, N. V. T. A., & Jiar, N. Y. K. (2017). Multisensory instruction for students with dyscalculia. *China-USA Business Review*, *16*(9). https://doi.org/10.17265/1537-1514/2017.09.002
- Lindenskov, L., & Lindhardt, B. (2019). Exploring approaches for inclusive mathematics teaching in Danish public schools. *Mathematics Education Research Journal*, *32*(1), 57–75. https://doi.org/10.1007/s13394-019-00303-z
- Media Sosial dan Iklan Tajaan: Analisis Bibliometrik dan Rangkaian. (2023). *Jurnal Pengurusan*, 68. https://doi.org/10.17576/pengurusan-2023-68-05
- Melissa, A. M. (2023). Equitable and inclusive mathematics classroom? Building awareness towards global hopes and fears about future.
- Nicholson, P. M. (2023). Pedagogy-as-praxis: a sociocultural framework for researching pedagogy as performance and discourse. *International Journal of Research & Method in Education*, *46*(5), 460–478. https://doi.org/10.1080/1743727X.2023.2167977
- Ogut, B., Webb, B., Hicks, J., Circi, R., & Yin, M. (2024). Exploring Mathematical Problem-Solving Through Process Mining: Insights from Large-Scale Assessment Log Data. *Computers in the Schools*, 1–31.
- Omoush, A., Salih, S. E., & Mehigan, T. (2023). Technology-Enhanced Inclusive Mathematics Learning: Promoting Equity and Lifelong Learning Opportunities for Vision-Impaired

Students. *Dublin City University Open Access Institutional Repository,* 1–6. https://doi.org/10.1109/ihtc58960.2023.10508879

- Opitz, E. M., Grob, U., Wittich, C., Häsel-Weide, U., & Nührenbörger, M. (2018). Fostering the Computation Competence of Low Achievers through Cooperative Learning in Inclusive Classrooms: A Longitudinal Study. *Learning Disabilities*, 16(1), 19–35. https://doi.org/10.5167/uzh-165614
- Pranckutė, R. (2021). Web of Science (WOS) and Scopus: the titans of bibliographic information in today's academic world. *Publications, 9*(1), 12. https://doi.org/10.3390/publications9010012
- Pratama, T. Y., Rakhmat, C., Hidayat, N., Sunardi, N., Wibawanto, A., Sidik, S. A., Abadi, R. F., Utami, Y. T., & Istiandaru, A. (2019). Developing collaborative mathematics learning model for students with intellectual disability. *Journal of Physics Conference Series*, *1188*, 012084. https://doi.org/10.1088/1742-6596/1188/1/012084
- Rizos, I., Foykas, E., & Georgakopoulos, S. V. (2024). Enhancing mathematics education for students with special educational needs through generative AI: A case study in Greece. *Contemporary Educational Technology*, 16(4), ep535. https://doi.org/10.30935/cedtech/15487
- Rodd, M. (2006). Commentary: Mathematics, emotion and special needs. *Educational Studies in Mathematics*, *63*(2), 227–234. https://doi.org/10.1007/s10649-005-9014-0
- Roos, H. (2023). Students' voices of inclusion in mathematics education. *Educational Studies in Mathematics*, 113. https://doi.org/10.1007/s10649-023-10213-4
- Sabirova, E. G., Zaripova, Z. F., Mikhaylovsky, M. N., Serebrennikova, Y. V., Serebrennikova, Y. V., Torkunova, J. V., & Buslaev, S. I. (2020). Recreating Imagination and Self-Regulation as means of mathematical thinking development in inclusive education. *Eurasia Journal of Mathematics Science and Technology Education*, 16(10), em1890. https://doi.org/10.29333/ejmste/8501
- Sahin, M., & Yorek, N. (2009). Teaching science to visually impaired students: A small-scale qualitative study. *Us-china Education Review*, 6(4), 19–26
- Azam, S. (2017). Program Pendidikan Inklusif Bagi Murid-Murid Berkeperluan Khas di Malaysia. https://www.researchgate.net/publication/332521325
- Samian, S., Samion, Awang, A., Kunci, K., Pendidikan, Bandar, P., & Hidup, K. (2017). Pendidikan Sebagai Komponen Kualiti Hidup Masyarakat Pinggir Bandar (Education ad Quality Components of Life in The Suburban Community). *Asian Journal of Environment*, 1(1), 2590–4310. https://spaj.ukm.my/ajehh/index.php/ajehh/article/download/26/47
- Schnepel S., Krähenmann H., Sermier D. R. & Moser O. E. (2020). The mathematical progress of students with an intellectual disability in inclusive classrooms: results of a longitudinal study. *Mathematics Education Research Journal*, *32*(1): 103 119.
- Berahim, S. (2019). Pengetahuan Pendidikan Inklusif Dalam Kalangan Siswa Guru Semester
 Enam Ipgkdri. Jurnal Penyelidikan Muaddib. 13(4), 39-54.
 https://ipgkdri.moe.edu.my/images/dokumen/Muaddib2019cover.pdf
- Syed Ismail, S. A., Maat, S. M., & Khalid, F. (2024). 35 years of fraction learning: Integrating systematic review and bibliometric analysis on a global scale. *Eurasia Journal of Mathematics. Science and Technology Education, 20*(12), em2543. https://doi.org/10.29333/ejmste/15657
- Tieso C. (2005). The effects of grouping practices and curricular adjustments on achievement, *Journal for the Education of the Gifted*, *29*(1), 60–89.

Vol. 15, No. 5, 2025, E-ISSN: 2222-6990 © 2025

- Tonegawa, Y. (2022). Education in SDGs: What is Inclusive and Equitable Quality Education? Sustainable Development Goals Series, 55–70. https://doi.org/10.1007/978-981-19-4859-6_4
- Wilson, C., Woolfson, L. M., & Durkin, K. (2019). The impact of explicit and implicit teacher beliefs on reports of inclusive teaching practices in Scotland. *International Journal of Inclusive Education*, 26(4), 378–396. https://doi.org/10.1080/13603116.2019.1658813
- Yakubova, G., Hughes, E. M., & Baer, B. L. (2019). Supporting students with ASD in mathematics learning using video-based concrete-representational-abstract sequencing instruction. *Preventing School Failure Alternative Education for Children and Youth*, 64(1), 12–18. https://doi.org/10.1080/1045988x.2019.1627999
- Yazicioğlu, T., & Akdal, D. (2023). An analysis of the effects of the Early Mathematics Intervention Program on early mathematics skills of Pre-School children at risk. *Participatory Educational Research*, 10(1), 237–250. https://doi.org/10.17275/per.23.13.10.1