Primary: Jurnal Pendidikan Guru Sekolah Dasar
journal homepage: https://primary.ejournal.unri.ac.id/
contents lists available at SINTA and DOAJ

Vol. 14 No. 6 (2025): December
http://dx.doi.org/10.33578/jpfkip.v14i6.852-870

Child-Friendly learning media for inclusive schools: a systematic literature review

Candra Abdillah [1 *], Ani Rusilowati [2], Barokah Isdaryanti [1], Dameis Surya Anggara [2]

[1] Universitas Pamulang, South Tangerang, Indonesia 15417
[2] Universitas Negeri Semarang, Semarang, Indonesia 50232

Article info

Keywords:
Child-friendly learning media, disability media, inclusion school, instructional media for special needs, and teaching media.

Abstract

This research aims to review child-friendly learning media that support inclusive school learning. The research method used is a systematic literature review (SLR) with a bibliometric approach. The data are in the form of search results for articles from various relevant Scopus sources. To find articles, researchers used five keywords in accordance with the PRISMA protocol. The article's source is the last 5 years (2019 - 2024). The number of articles analyzed was 84 Scopus-indexed articles. The results of the literature review explain (1) child-friendly learning media in inclusive schools include various types such as Gamification media for ADHD, PECS and SELFI for autistic students, multiliteracies-based online and social media platforms, and Machine Learning-based Media Augmentation (ML-MA) for accessible digital environments; (2) learning methods that support the application of teaching media such as *differentiated instruction*, *collaborative learning*, and the *Universal Design for Learning (UDL);* (3) The principles of implementing child-friendly teaching media prioritize child-centered, interactive, safe, developmentally appropriate, enhanced access, and accessibility. (4) The main obstacles in the implementation of this media are teachers' lack of understanding of the needs of children with disabilities, limited facilities, and a lack of professional training.

* Corresponding Author.
E-mail address: candra_abdillah17@students.unnes.ac.id (Candra Abdillah)
DOI: http://dx.doi.org/10.33578/jpfkip.v14i6.852-870
Received 18 May 2025; Received in revised form 1 October 2025; Accepted 5 October 2025
Available online 1 December 2025
e-ISSN 2598-5949 | p-ISSN 2303-1514 © The Authors.

1. Introduction

Inclusive schools accommodate learners with diverse backgrounds and needs, including children with special needs (Ainscow, 2020). Education in inclusive schools emphasizes the importance of providing a learning environment that supports all learners, including children with special needs. One important element in realizing effective inclusive education is the use of child-friendly learning media in inclusive schools. The implementation of child-friendly teaching media in inclusive schools plays an important role in creating a fair, fun, and effective learning

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

process for all learners, including children with special needs. Learning media designed with children's psychological, cognitive, and social aspects in mind can encourage active participation, increase learning motivation, and strengthen interactions between students and teachers in an inclusive environment (UNESCO, 2017). Child-friendly media also supports the principle of child-centered education by adjusting the content and form of information delivery to suit the abilities, interests, and background of each individual (Andrian et al., 2022). In addition, the user-friendly media aligns with the alignment. Therefore, the use of inclusive and adaptive teaching media is not only a teaching aid but also part of a pedagogical strategy to ensure that every child can learn and develop optimally (Rasmitadila et al., 2019).

Although many studies have discussed the use of learning media in inclusive schools, most still focus on the effectiveness of media on student learning outcomes in general, without specifically considering child-friendly principles in their design and implementation (Erliani et al., 2025). In addition, existing literature tends to discuss media for specific types of disabilities, such as autism or ADHD, without thoroughly examining the needs of various types of disabilities in the context of inclusive learning (Kusmawati et al., 2023; Rustandar & Widinarsih, 2023). Systematic research on the diversity of teaching media types, methods, and barriers to implementing child-friendly media in inclusive schools remains limited and scattered across various disciplines, making it difficult to obtain a comprehensive understanding. Furthermore, aspects of child-friendly media design principles, such as accessibility, interactivity, and suitability for children's cognitive and emotional development, have not been the main focus in many empirical studies (Purbasari et al., 2022).

Furthermore, a UNICEF report (2025) emphasizes that inclusion should be a foundational principle in research design, not merely an outcome. It points out that children with disabilities, especially those with complex communication needs, are often underrepresented in research (Tramontano et al., 2025). This underrepresentation underscores the necessity for a comprehensive approach that encompasses various disabilities and learning needs. Additionally, a study examining the academic achievement gap between students with various Special Educational Needs and Disabilities (SEND) and their peers reveals persistent disparities in educational outcomes (Daniel, 2025). These findings highlight the importance of developing inclusive learning media that cater to a broad spectrum of disabilities to bridge these gaps effectively.

A Systematic Literature Review (SLR) on child-friendly learning media in inclusive schools is essential to identify which types of media work best in practice. The review will help teachers, researchers, and curriculum developers gain clear, evidence-based guidance for selecting or designing effective learning media, thereby supporting the implementation of equitable and sustainable inclusive Education. This Systematic Literature Review (SLR) offers a novel contribution by providing a comprehensive synthesis that has not been sufficiently addressed in previous studies on child-friendly learning media in inclusive schools. First, it identifies and classifies the various types of child-friendly media that have been implemented, thereby highlighting current trends and innovations. Second, it examines the learning methods that support the adoption of child-friendly models, which have often been discussed only in a fragmented manner. Third, it elaborates on the principles of child-friendly media design specifically within the context of inclusive Education, providing a clearer foundation for developing more adaptive media. Fourth, it systematically analyzes the obstacles encountered in implementing such media, enabling the formulation of practical recommendations for teachers, media developers, and policymakers. Thus, this review not only enriches the academic

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under
a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

literature but also establishes both conceptual and practical foundations for the advancement of more effective and sustainable inclusive learning media.

Therefore, to address this gap, this study aims to answer the following fundamental questions regarding child-friendly learning media used in inclusive schools. The research questions that will be discussed are (1) what are the types of child-friendly learning media used in inclusive schools? (2) What are the learning methods that can support the implementation of child-friendly learning models in inclusive schools? (3) What are the principles in the design of child-friendly learning media in children's schools?; (4) What are the obstacles in the implementation of child-friendly media in inclusive schools?

2. Method

This research uses a bibliometric approach that aims to review the literature on the application of child-friendly learning media in inclusive schools. The method used in this research is a Systematic Literature Review (SLR). SLR is a research approach that aims to identify, evaluate, and summarize findings from relevant studies on a particular topic, question, or phenomenon (van Dinter et al., 2021). This method is intended to provide thorough, transparent answers to research questions through structured, systematic stages focused on child-friendly learning media in inclusive schools.

The data sources used were Scopus articles. The data sources used in the systematic literature review are leading articles from Scopus published between 2019 and 2024 to provide a comprehensive picture of child-friendly learning media in inclusive schools. The keywords searched were "Child-Friendly learning media", "disability media", "inclusion school", "instructional media for special needs", and "teaching media". The keywords were selected to ensure the articles were relevant to the research topic.

In conducting a Systematic Literature Review (SLR), determining inclusion and exclusion criteria is a crucial step to ensure that only relevant and quality studies are included in the analysis. Inclusion criteria are the conditions or characteristics that a study must meet to be included in a review, such as an appropriate topic, the type of methodology, the language of publication, and the specific year of publication. Conversely, exclusion criteria are used to filter out ineligible studies, such as articles that are not available in full text, studies with low methodological quality, or those outside the scope of the topic (Paul et al., 2021). These criteria are explicitly established before the literature search to reduce selection bias and increase the study's reproducibility (Rehman et al., 2020). With explicit inclusion and exclusion criteria, researchers can systematically and objectively screen articles, thereby making the SLR results more valid and reliable.

The inclusion criteria for this study were articles published between 2019-2024, focusing on primary school-aged children, and including empirical studies (quantitative/qualitative) that discussed child-friendly learning media in inclusive schools. The exclusion criteria for this study are articles that discuss general education without any link to inclusion or learning media. Based on the inclusion and exclusion criteria, researchers identified 84 Scopus journal articles with high relevance.

The research stages followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol. Data processing in this study follows the systematic stages of the PRISMA protocol, starting from the identification process of relevant studies, followed by screening of research results, assessing the feasibility of previous studies, to the inclusion stage, namely collecting articles or journals that match the focus of the study topic (Page et al., 2021). Based on the results of the 2020 PRISMA diagram conducted by researchers, 344 initial articles

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.
[e-**ISSN 2598-5949** | p-**ISSN 2303-1514**]

were identified in Scopus, but only 84 were selected after screening titles, abstracts, and full texts. The details of the stages of the research PRISMA protocol used in this study include the following:

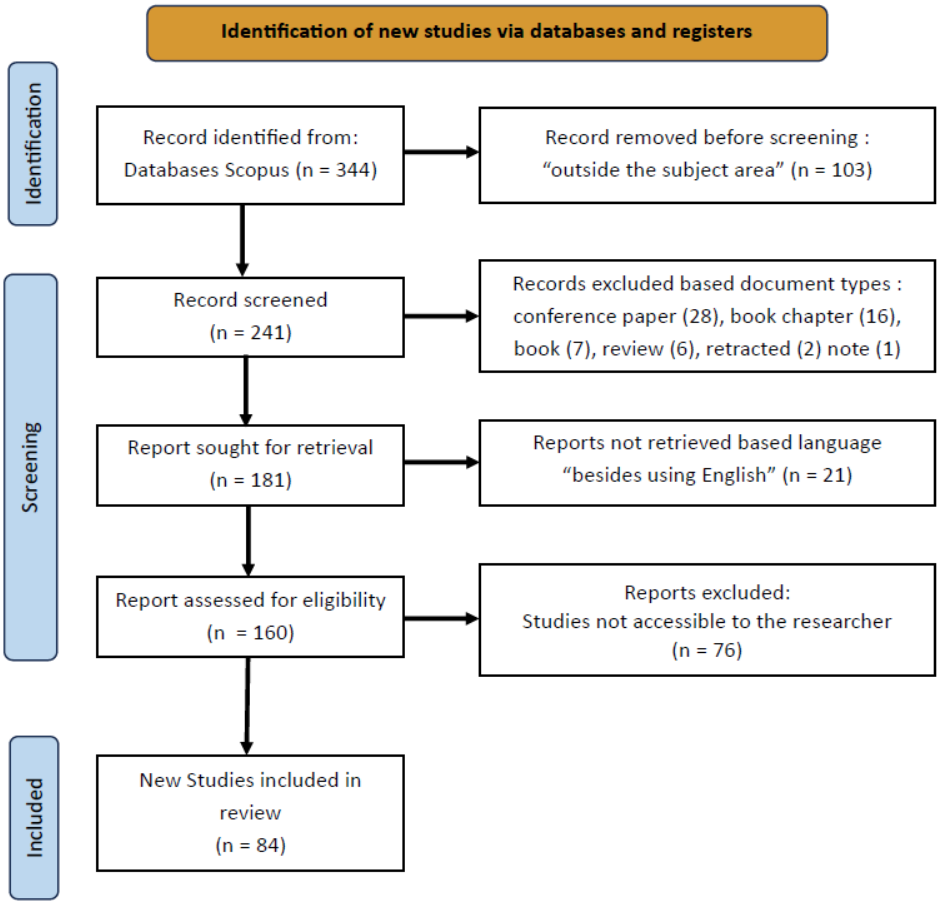

Figure 1. PRISMA 2020 flowchart

To analyze and map research data related to the application of child-friendly learning media in inclusive schools, using VOSviewer software. VOSviewer is software for visually displaying and analyzing bibliometric data. The information processed includes the relationship between publications, authors, journals, and keywords in scientific papers. Through this tool, users can map scientific collaboration, distribution of research topics, and development trends in a discipline. Before using the VOSviewer application, researchers have ensured that metadata in the Mendeley desktop application is complete, including author names, publication years, and author keywords. Then open the VOSviewer application and start importing bibliographic data with completed metadata. This study employs co-occurrence analysis to map conceptual relationships by examining the frequency with which keywords co-occur. The unit of analysis is the author keywords, as they best represent the primary focus of each study. VOSviewer's *network, overlay,* and *density visualizations* highlight dominant keywords, thematic clusters, and potential research gaps. Through this approach, the study provides a clear overview of trends, developmental directions, and new opportunities in research on child-friendly learning media in inclusive schools. Network, overlay, and density visualizations in VOSviewer can address the research questions by highlighting: (1) the types of child-friendly learning media through keyword

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under
a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

clusters, (2) the supporting learning methods through topic linkages, (3) the dominant design principles via density mapping, and (4) the obstacles in implementation through the identification of gaps and research trends. Together, these visualizations provide a comprehensive overview of patterns, trends, and challenges in the application of child-friendly media in inclusive schools.

3. Results

The initial stage in conducting a systematic literature review on implementing child-friendly learning media in inclusive schools is searching for databases of articles. The search for data sources was conducted by identifying article selection criteria. The database was selected based on the quality of Scopus publications highly relevant to the research topic. The article selection indicators include the following:

Table 1. Article determination indicator

Indicator	Description
Year of Publication	2019-2024
Topic	Child-Friendly Learning Media for Inclusive Schools
Publications	Scopus
Document type	Article
Language	English
Keywords	"Child-Friendly learning media", "disability media", "inclusion school", "instructional media for special needs", "teaching media"

There are 84 articles relevant to the research topic, but only 18 are highly relevant. This research also aims to determine the development of learning media for inclusive schools in 2019 - 2024. The following is the number of Scopus publications from 2019 to 2024 that discuss child-friendly learning media for inclusive schools in Figure 2.

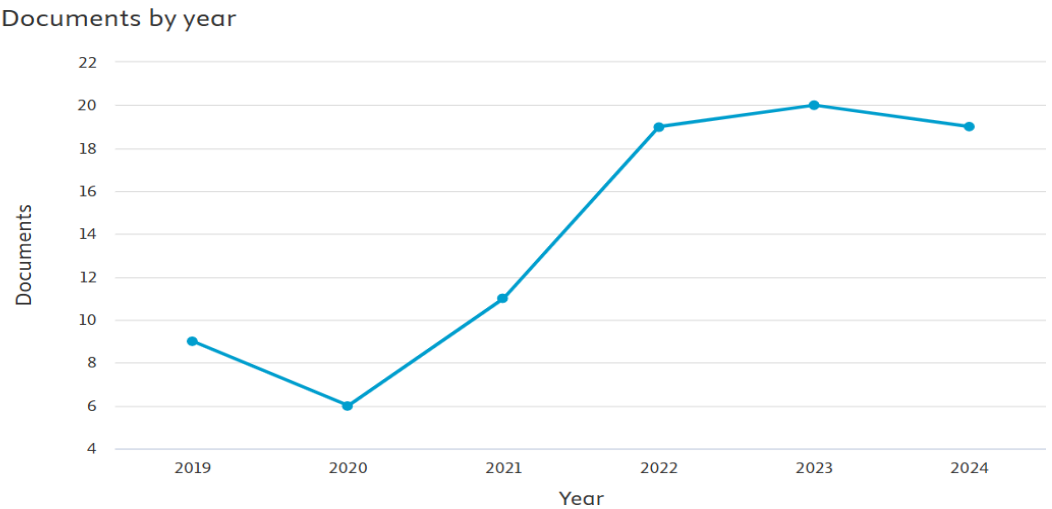

Figure 2. Scopus publication trends on child-friendly teaching media in inclusive schools

Figure 2 shows that the publication trend on child-friendly learning media in inclusive schools shows significant growth over the past five years, with the lowest point in 2020 (6 documents) followed by a sharp increase, peaking in 2023 with 20 documents. This upward trend indicates growing scholarly interest in integrating inclusive, child-centered learning media,

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

especially after 2021, when global education systems sought innovative solutions for equitable learning. However, the slight decline in 2024 suggests either a stabilization or a potential research gap. Future studies could focus on emerging technologies such as AI-driven adaptive learning, sustainable implementation strategies, and longitudinal impacts of child-friendly media on diverse student populations, which remain underexplored despite the overall growth in publications. The results of the analysis of articles on child-friendly learning media in inclusive schools by the author's country are shown in Figure 3.

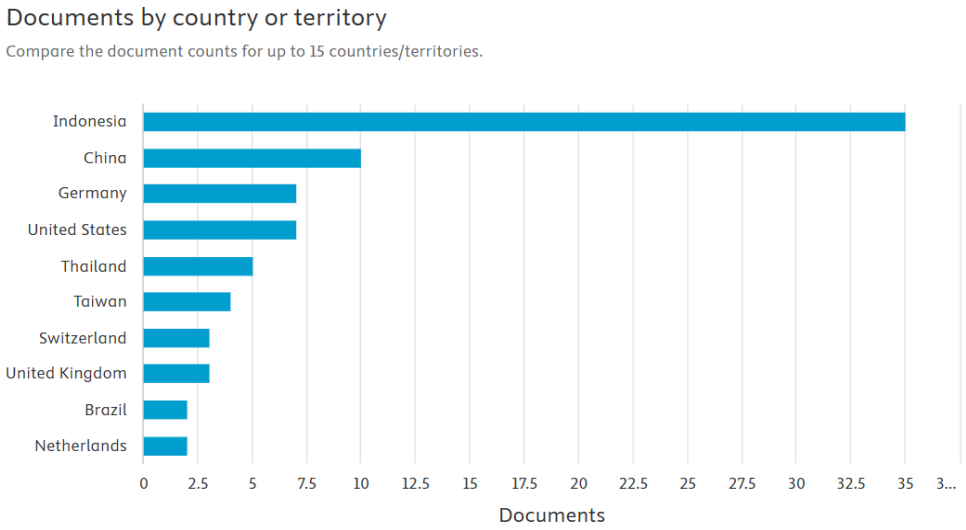

Figure 3. Country in the study of child-friendly teaching media in inclusive schools

Based on Figure 3, which shows the number of articles published by authors' country, the distribution of publications on child-friendly learning media in inclusive schools reveals Indonesia as the leading contributor, with a significantly higher number of documents than other countries. China, Germany, and the United States follow at a moderate level, indicating growing academic engagement in these regions. The dominance of Indonesia suggests that inclusive Education and child-friendly pedagogical practices are central issues within its educational research agenda, likely influenced by national policies promoting inclusive schooling. The increase in publications in 2024 may indicate increasing academic attention to the importance of learning media in inclusive schools.

Furthermore, the articles identified in Scopus were downloaded in CSV (Comma-Separated Values) format to facilitate data management in Mendeley Desktop. In the Mendeley application, the article database is checked for the title, journal, year of publication, author keywords, and article URL. VOSviewer clusters keywords that frequently appear together, with each color group representing a set of interrelated research themes. This device aims to ensure metadata is present, making it easier for researchers to analyze data further in VOSviewer. If the data is complete, the next stage is to use the VOSviewer application to visualize relationships between articles using the authors' keywords, using a bibliometric approach. From 84 Scopus-indexed articles on child-friendly learning media in inclusive schools, the following VOSviewer results were obtained.

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

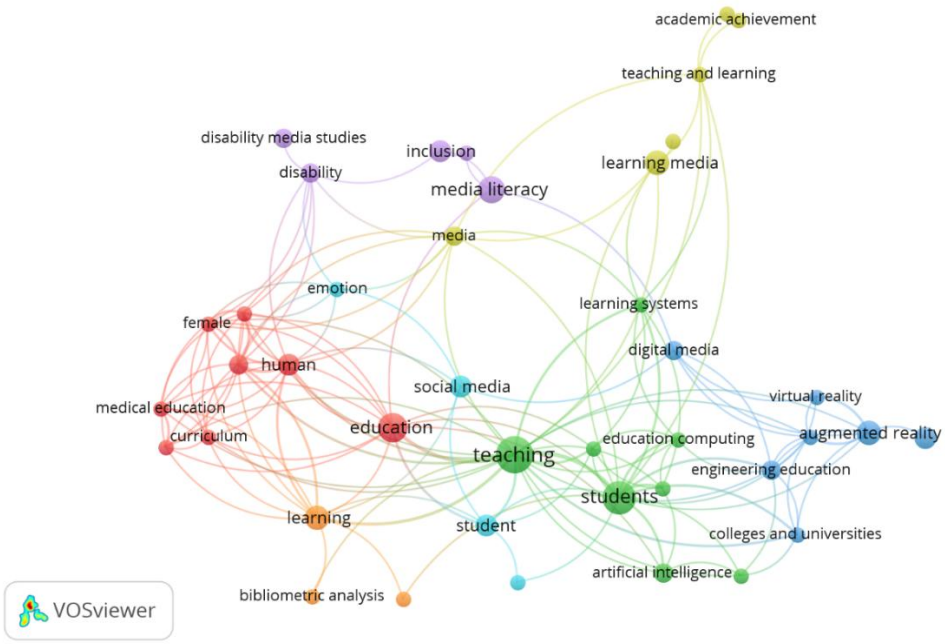

Figure 4. Network visualization results
about child-friendly learning media in inclusive schools

Based on the VOSviewer Network visualization, the network shows four major clusters that reflect the interconnectedness of *teaching*, *students*, *media literacy*, *education*, and *learning technologies*. Addressing the first question, the types of child-friendly learning media used in inclusive schools are reflected through nodes such as *digital media*, *social media*, *learning media*, and *augmented reality*. These suggest that inclusive education environments increasingly adopt technology-driven tools, including artificial intelligence, virtual reality, and adaptive media platforms, to make learning more engaging and accessible for diverse learners.

For the second and third questions, the diagram highlights *teaching*, *learning systems*, and *academic achievement* as central themes, indicating that supportive methods include collaborative learning, differentiated instruction, and the integration of media literacy into the curriculum. The principles for designing child-friendly media for inclusive schools can therefore be drawn from the links among inclusion, disability, and educational *computing*. These principles emphasize accessibility, interactivity, emotional engagement, and alignment of media with students' social and academic needs, ensuring that diverse learners, including those with disabilities, are equally supported.

Finally, regarding obstacles, clusters around *disability*, *curriculum*, and *human factors* point to challenges in the implementation process. Barriers may include limited teacher competence in media use, inadequate infrastructure, curriculum rigidity, and social factors such as equity and inclusion for female or disabled learners. Moreover, the scattered connections between *bibliometric analysis* and *emotion* suggest that while theoretical frameworks and emotional engagement are recognized, translating them into consistent practice remains a key challenge in inclusive schools.

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under
a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

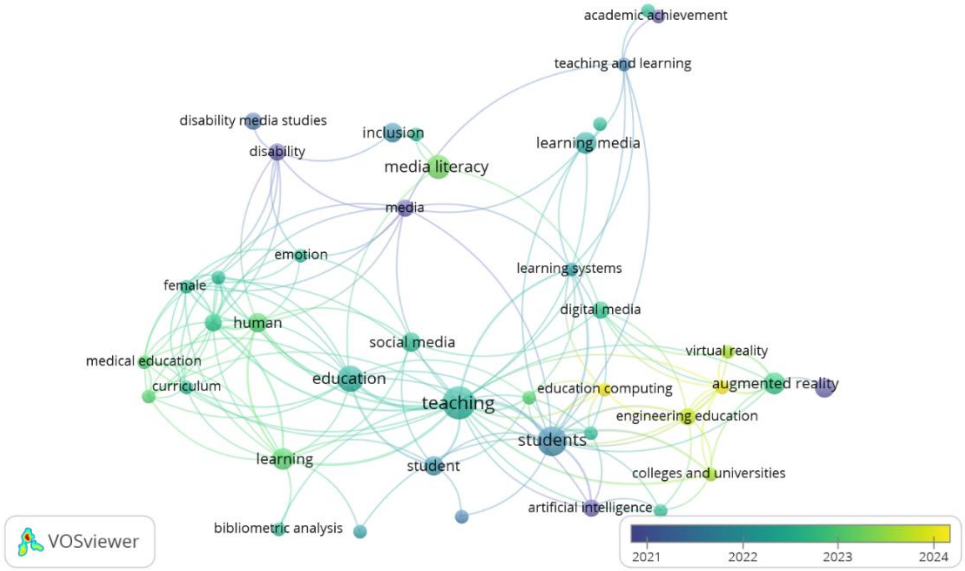

Figure 5. Overlay visualization results
about child-friendly learning media in inclusive schools

The overlay visualization generated by VOSviewer illustrates the evolution of themes in the literature from 2021 to 2024, highlighting how research on inclusive and child-friendly learning media has shifted toward more technology-enhanced approaches. The cluster around *augmented reality*, *virtual reality*, *digital media*, and *artificial intelligence* (yellow–green nodes, representing more recent years) suggests that these types of media are increasingly applied to support inclusive education. In contrast, earlier studies (purple–blue nodes, e.g., *disability*, *curriculum*, *media literacy*) focused more on conceptual and foundational issues. This indicates that child-friendly learning media in inclusive schools now range from traditional educational resources to advanced digital tools that enhance interactivity and accessibility for all learners.

Furthermore, the connections among teaching, students, learning systems, and academic achievement indicate that effective learning methods include differentiated instruction, collaborative learning, and Universal Design for Learning (UDL) approaches, which ensure diverse needs are met. The principles in designing child-friendly media are reflected in the emphasis on *inclusion*, *emotion*, and *media literacy*, suggesting that accessibility, engagement, and adaptability must be prioritized. However, obstacles remain evident in the persistent links to *curriculum* and *medical education*, including rigid curricula, insufficient teacher training, and inadequate infrastructure. Thus, while technological innovation is advancing rapidly, the effective implementation of child-friendly media in inclusive schools still depends heavily on systemic support and educators' professional readiness.

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under
a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

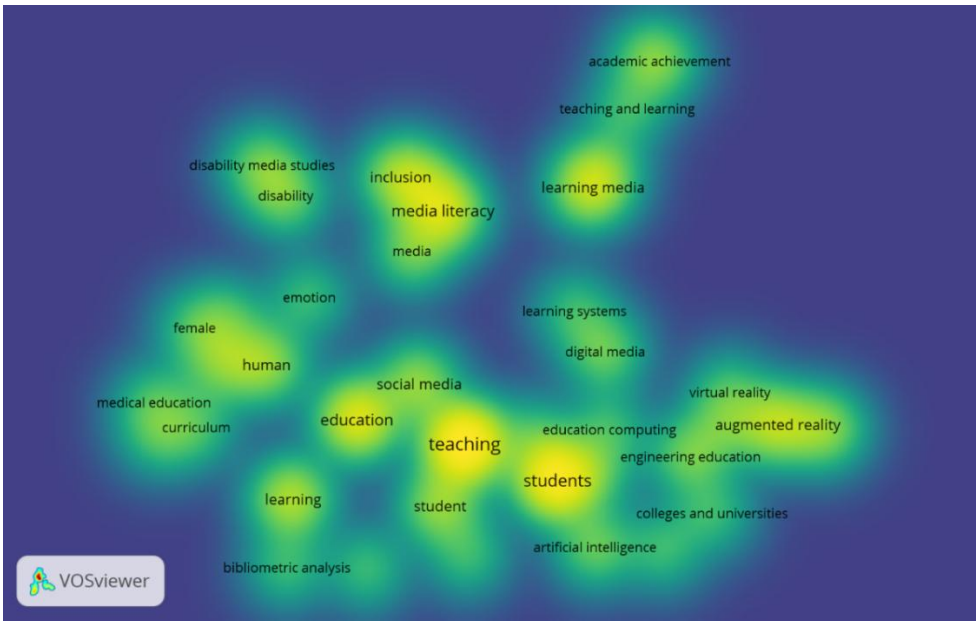

Figure 6. Density visualization results
about child-friendly learning media in inclusive schools

The density visualization highlights central research concentrations around *teaching*, *students*, *education*, and *media literacy*, indicating that these are the most prominent themes in the discourse on inclusive education and child-friendly learning media. In terms of media types, the high density near digital media, learning media, augmented reality, and virtual reality reflects the growing recognition that technology-based tools are increasingly effective for engaging diverse learners in inclusive classrooms. These media enable interactive, personalized, and accessible learning experiences for children with different needs. Additionally, the linkages with *social media* and *artificial intelligence* suggest emerging opportunities for adaptive learning systems and collaborative platforms that enhance inclusivity.

The visualization also shows dense connections between *inclusion*, *learning systems*, and *academic achievement*, suggesting that supportive methods include differentiated instruction, collaborative learning, and the application of Universal Design for Learning (UDL) principles. These methods promote multiple pathways for engagement, representation, and expression. The principles for designing child-friendly learning media, therefore, emphasize accessibility, interactivity, emotional engagement, and alignment with students' developmental and academic needs. However, the density around *curriculum*, *disability*, and *human* rights indicates persistent obstacles, including rigid curricular frameworks, insufficient teacher training, and limited infrastructure. These challenges underscore that, despite technological advances, the successful implementation of child-friendly media in inclusive schools still requires systemic support, teacher capacity-building, and equitable resource allocation.

Of the 84 articles found, the authors analyzed 18 that were highly relevant to child-friendly learning media in inclusive schools. The following is a summary of the 18 research results presented in Table 2 of the systematic literature review on child-friendly learning media in inclusive schools.

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under
a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

Table 2. Results of previous research on child-friendly teaching media in inclusive schools

No.	Category	Author	Research results
1	Types of child-friendly learning media	(Juhanaini et al., 2025)	This study proves that the use of educational game media based on Android technology can improve learning needs in arithmetic material for children with special needs
2	Types of child-friendly learning media	(Efrina et al., 2019)	The use of Dienes Rainbow Blocks media can help improve the ability of students who have learning difficulties in determining place value
3	Types of child-friendly learning media	(Frisch et al., 2025)	This research provides an understanding of the academic engagement of students with intellectual disabilities (ID) in inclusive education settings and the role that digital media through iPads plays in supporting this process.
4	Types of child-friendly learning media	(Ekwok et al., 2025)	Based on the results of this study, it can be concluded that there is a statistically significant combined relationship between the predictor variables (Twitter, Facebook, and WhatsApp) and inclusive education and lecturers' teaching effectiveness in higher education institutions located in Cross River State, Nigeria.
5	Types of child-friendly learning media	(Jones et al., 2022)	This article describes an annual project that brings together disabled media makers and students to produce three films and a podcast based on critical access theory and disability justice, which requires innovative and collaborative access planning from the earliest stages of each production
6	Types of child-friendly learning media	(Finandhita & Octaviana, 2023)	The results of the research are in the form of developing teaching media for arithmetic operations with the User Centered Design method for children with disabilities
7	Types of child-friendly learning media	(Paris et al., 2024)	The study examined the effectiveness of Picture Exchange Communication System (PECS) protocols in people with autism. The implementation factors identified in this review were drawn from qualitative analysis of previous researchers' anecdotal statements or from measures of social validity.
8	Types of child-friendly learning media	(Kusmawati et al., 2023)	The results showed that gamification media can improve ADHD students' concentration in learning.
9	Types of child-friendly learning media	(Sailer & Homner, 2020)	Gamification can enhance the effects of competition and collaboration for motivational learning in schools.
10	Child-friendly learning methods	(Vigo-Arrazola & Moreno-Pinillos, 2025)	This paper discusses how teachers in multigrade classrooms confront a culture of leveling in teaching by implementing inclusive and innovative practices that leverage digital media.
11	Child-friendly learning methods	(Abendroth, 2024)	To support adolescents with language-based learning disabilities (LLD), speech-language therapists (SLPs) need to adopt a framework that utilizes online platforms and social media based on a multiliteracies approach.

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

No.	Category	Author	Research results
12	Child-friendly learning methods	(Osuna et al., 2023)	The SELFI (Socialization, Education, and Learning for the Internet) program was designed by identifying focus skills, goals, and appropriate evidence-based considerations and strategies to support autistic adults in online social communication.
13	Child-friendly learning methods	(Chen & Aleem, 2024)	This article proposes an intelligent classification method for learning time series data using Long Short-Term Memory (LSTM) as the foundation of a deep neural network.
14	Child-friendly learning methods	(Andi et al., 2023)	A comprehensive solution that integrates modern media needs with accessibility demands for people with disabilities, creating a more inclusive digital environment. Machine Learning-based Media Augmentation (ML-MA) technology achieves the highest accuracy rate of 96%, with exact text generated.
15	Principles of learning media design	(López Fuentes, 2024)	The findings show that teachers use digital media by paying attention to students' aspirations and interests, recognizing students' knowledge ownership, and encouraging interactions among all parties.
16	Principles of learning media design	(O'Toole, 2023)	Findings from the initiative showed that learning social and emotional skills led to important gains in interpersonal and communication skills. This enhancement strengthens their storytelling abilities and fosters awareness of others' needs in conversation, which, in turn, encourages an open attitude towards cultural diversity.
17	Principles of learning media design	(Tomé Klock et al., 2024)	The results of this study illustrate how Gamification can improve performance, enrich the user experience, and drive change, while evaluating its design with gender, age, and disability in mind.
18	Obstacles in media implementation	(Abdalgane, 2022)	This research examines the challenges faced by each type of media and the role of social media by presenting a comprehensive overview of the different types of social media and social networking sites, the utilization of social media in education, student engagement through social media, the Influence of social media on academic achievement, the application of social media in English as a Foreign Language (EFL) classrooms, and a study of social media in the context of inclusive higher education in Saudi Arabia..

4. Discussion

Based on the visualization results and previous research, it can be inferred that child-friendly learning media in inclusive schools are related to the types of teaching media, learning methods, and the design principles of child-friendly learning media. The types of child-friendly learning media in inclusive schools include the use of social media (Abdalgane, 2022; Abendroth, 2024; Osuna et al., 2023), application of digital media (Frisch et al., 2025), android-based educational applications for students with disabilities (Juhanaini et al., 2024), broadcast media (Jones et al., 2022), to the use of computers in learning for students with disabilities (Finandhita & Octaviana, 2023). There is also the use of picture- and symbol-based media, such as the Picture Exchange Communication System (PECS), for people with Autism (Paris et al., 2024). Gamification-based

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

learning media is also used by teachers in inclusive learning for students with disabilities, especially hyperactive children (Kusmawati et al., 2023; Sailer & Homner, 2020; Tomé Klock et al., 2024). In addition to learning media, to support child-friendly learning, it is also necessary to apply appropriate learning methods. Based on the results of Network Visualization of 84 scopus articles, data on child-friendly learning methods used include deep learning (Chen & Aleem, 2024; Mukundan et al., 2024), lifelong learning (Al-Hail et al., 2024), and machine learning (Furuya et al., 2023; Kumia et al., 2024).

It can be concluded that the types of child-friendly learning media used in inclusive schools are. Gamification media (to improve concentration in ADHD and enhance motivation), Picture Exchange Communication System (PECS) for autistic students, multiliteracies-based online and social media platforms, the SELFI program for autistic adults' online communication, collaborative creative media (films and podcasts), and Machine Learning-based Media Augmentation (ML-MA) for accessible digital environments.

After listing several child-friendly media in inclusive schools, the researcher will discuss their use from the perspectives of cognitive and behavioral theories. **Gamification** in educational media can be an effective strategy for children with ADHD, as it transforms monotonous learning activities into engaging, interactive experiences. Children with ADHD often struggle to maintain sustained attention, but game elements such as points, levels, challenges, and rewards can capture and direct their focus more effectively because the learning process feels enjoyable and varied. Moreover, the reward system embedded in Gamification enhances both intrinsic and extrinsic motivation, as children feel acknowledged every time they achieve a specific goal. This mechanism fosters a sense of accomplishment, builds self-confidence, and reduces frustration when encountering difficulties. Therefore, Gamification not only supports concentration in children with ADHD but also promotes sustained learning motivation.

The picture exchange communication system (PECS) is used because many autistic students struggle with verbal communication. Through pictures, they can more easily express needs, reduce frustration, and improve social interaction. The system also supports gradual language development and fosters independence in both learning and daily life. The use of **multiliteracies-based online and social media platforms** is crucial for inclusive students, as it provides access to learning in multiple modes (text, audio, video, images) that meet diverse learning needs. These platforms promote active participation, develop 21st-century skills, and foster self-confidence and social inclusion. For example, teachers can use Google Classroom to share materials in different formats, YouTube for visual explanations, and WhatsApp Groups as interactive discussion spaces accessible to all learners. In this way, inclusive students can learn more flexibly and feel part of an equitable learning community.

The SELFI (social engagement and learning for inclusion) program supports autistic adults in overcoming challenges of face-to-face communication, such as social anxiety and nonverbal difficulties. Online interaction provides a safe, flexible space, allows extra response time, and supports text or visuals. Its goals are to build confidence, social skills, and connectedness. **Machine learning-based media augmentation (ML-MA**) is crucial for inclusive education as it adapts digital media to diverse student needs. It can automatically provide enlarged text for visually impaired learners, captions for students with hearing difficulties, and personalized learning recommendations. In this way, ML-MA enhances accessibility, engagement, and equal learning opportunities for all students.

The answer to research question no 2 discusses child-friendly learning methods. Learning methods that can support the implementation of child-friendly learning models in inclusive schools include the visualization, which indicates that the most supportive learning methods for

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

implementing child-friendly media in inclusive schools are differentiated instruction, collaborative learning, and the Universal Design for Learning (UDL) approach. These methods are effective in addressing diverse student needs, enhancing engagement, and improving academic achievement by providing multiple pathways for engagement, representation, and expression. Accordingly, such strategies play a crucial role in establishing an inclusive learning system that is genuinely responsive to the needs of all learners.

In child-friendly media practices within inclusive schools, *differentiated instruction*, *collaborative learning*, and the *Universal Design for Learning (UDL)* can be explained through both cognitive and behavioral perspectives. From a cognitive theory standpoint, differentiated instruction allows teachers to adjust content, processes, and learning products according to students' memory capacity, learning styles, and developmental stages, enabling each child to construct meaningful understanding. *Collaborative learning*, grounded in social cognitive theory, emphasizes interaction as a key mechanism for knowledge construction; through group work, students learn from one another, strengthen conceptual understanding, and develop social skills. Meanwhile, UDL builds on cognitive and behavioral principles by providing multiple pathways for engagement, representation, and expression, ensuring equal access for learners with diverse needs. These methods are essential because they promote inclusion not only as physical integration but also as equitable and effective learning opportunities. For instance, in a mathematics lesson, teachers may provide interactive digital media with varying levels of difficulty (differentiation), assign mixed-ability groups to solve problems collaboratively (collaboration), and offer multiple learning formats such as text, audio, and visual resources (UDL). Through these practices, child-friendly media becomes a powerful tool for enhancing engagement, autonomy, and academic achievement for all students. Although methods such as differentiated instruction, collaborative learning, and UDL are effective, their implementation requires teachers to adapt content, processes, and media to each student's needs, which can be a practical challenge in classrooms with limited resources. Additionally, implementing these methods requires complex planning and management, including student grouping, the provision of multiple media formats, and monitoring group interactions, which may limit their consistency and effectiveness.

The answer to research question 3 concerns the principles for the design of child-friendly learning media in children's schools, based on the results of applying child-friendly media in inclusive schools. Several considerations are needed. The principles of child-friendly learning media in inclusive schools must be grounded in fulfilling children's needs, interests, and rights, with children at the center of the educational process. The media used must be interactive to actively engage children in the learning process and encourage their participation in learning activities (Salih et al., 2022). Furthermore, media must be safe, not only in terms of content that is free from discrimination and violence, but also in terms of visual and audio aspects that are friendly to children (Mukundan et al., 2024). Adaptation to the stages of cognitive and emotional development is also an important principle, because each child has different developmental characteristics, so media must be flexible and appropriate to their level of understanding (Krasavina et al., 2023; Kumia et al., 2024). To increase access to learning, child-friendly media should also be equipped with subtitles, which are beneficial for children with hearing impairments and in supporting literacy strengthening (Andi et al., 2023). The following accessibility principle requires media to be easily accessible and usable by all children, including those with special needs, by considering color contrast, font size, simple navigation, and support for assistive technology (Huda et al., 2025). By applying these principles, learning media can create an inclusive and safe learning environment that optimally supports children's cognitive

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.
[e-**ISSN 2598-5949** | p-**ISSN 2303-1514**]

and emotional development. These principles can address obstacles such as teachers' lack of understanding of students with special needs. This can be achieved through accessible media design based on UDL, which provides multiple pathways for representation, expression, and engagement. Such media allow students to comprehend material and demonstrate understanding independently through text, audio, visual, interactive, or gamified formats, while also supporting teachers with integrated guidance and contextual support, making inclusive learning more effective and easier to implement.

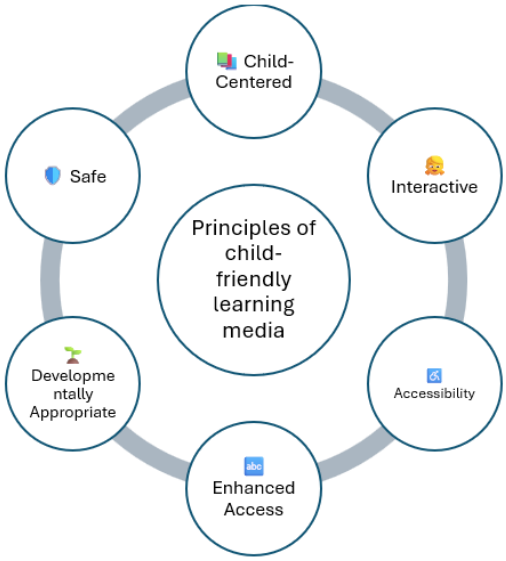

Figure 7. Principles in the design of child-friendly learning media

The answer to research question no. 4 is that the obstacles to implementing child-friendly media in inclusive schools are teachers' limited understanding of students' learning needs with various disabilities, leading to less adaptive media and less support for this diversity (Sofi-Karim et al., 2023). In addition, limited facilities and infrastructure, such as supporting technology and teaching materials accessible to all students, are significant obstacles (Murire & Cilliers, 2019). The lack of professional training for educators in designing and using inclusive media also exacerbates this situation. Therefore, synergy between educators, schools, and policymakers is needed to create a truly welcoming learning environment that reaches all learners without discrimination.

To address the obstacles in implementing child-friendly learning media in inclusive schools, an integrated set of strategic steps is required. First, teachers should receive continuous professional training on the characteristics of various disabilities and the design of adaptive media, enabling them to meet diverse learning needs. Second, the development of teaching media must be based on the principles of *universal design for learning* (UDL), ensuring flexibility, interactivity, and accessibility for all students. Third, adequate facilities and infrastructure, such as technological tools and alternative learning resources, should be prioritized through collaboration between schools and the government. Fourth, multi-stakeholder synergy involving teachers, schools, parents, and policymakers is essential to strengthen inclusive education policies and guarantee the effective use of child-friendly media. Fifth, ongoing monitoring and evaluation are crucial to ensure that the media remains relevant and is continuously improved based on feedback from all stakeholders. Through this systematic approach, existing barriers can

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

be transformed into opportunities to create a truly child-friendly and inclusive learning environment.

Based on the visualization results and the table of previous research results, this study prioritizes a holistic approach to the types of child-friendly teaching media in inclusive schools, child-friendly learning methods, and child-friendly learning media design principles. The application of child-friendly teaching media in inclusive schools will have cognitive and emotional impacts on both formal students and students with disabilities.

5. Conclusion

Based on the literature review, child-friendly learning media in inclusive schools include various types such as gamification media for ADHD, PECS and SELFI for autistic students, multiliteracies-based online and social media platforms, and Machine Learning-based Media Augmentation (ML-MA) for accessible digital environments; (2) learning methods that support the application of teaching media such as *differentiated instruction*, *collaborative learning*, and the *Universal Design for Learning (UDL);* (3) The principles of implementing child-friendly teaching media prioritize child-centered, interactive, safe, developmentally appropriate, enhanced access, and accessibility. (4) The main obstacles in the implementation of this media are teachers' lack of understanding of the needs of children with disabilities, limited facilities, and lack of professional training. Therefore, collaboration between teachers, schools, and policymakers is needed to create an inclusive and non-discriminatory learning environment.

6. Implications

This study is the first to comprehensively map the research landscape of child-friendly learning media in inclusive schools using a bibliometric approach, identifying three core pillars: media types, supporting methods, and design principles. The implications of this study suggest that teachers should begin with simple, adaptable media and engage in training on UDL and differentiated instruction to address the needs of students with disabilities better better. Schools can provide support through basic facilities, internal mentoring programs, and collaboration with universities or educational technology communities. For policymakers, regulations that ensure continuous professional development and specific funding for child-friendly media are essential. Meanwhile, future researchers may investigate the effectiveness of integrating deep learning methods with visual media for autistic students, as well as the use of digital multiliteracy media for children with ADHD. These implications contribute both practical and academic value in advancing inclusive education.

7. Limitation

The findings contribute to the development of a research roadmap on child-friendly learning media in inclusive schools. A limitation of this study is the use of articles sourced only from the Scopus database, which may not comprehensively represent the issues of child-friendly learning media in inclusive schools. Future research should include articles from other reputable international databases, such as *Web of Science* and *Dimensions Scholars*.

Credit authorship contribution statement

Candra Abdillah: Methodology, Formal analysis, Data curation, Conceptualization. **Ani Rusilowati**: Review, Methodology, **Barokah Isdaryanti**: Review, Methodology, **Dameis Surya Anggara**: Formal analysis, Data Curation

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

Declaration of competing interest

The authors state that they have no financial or personal conflicts of interest that might be perceived as affecting the objectivity of this work.

Ethical Declaration

Participants consented voluntarily after being informed of the study's purpose and procedures, as well as their right to withdraw at any time without negative consequences.

References

Abdalgane, M. (2022). The EFL Learning Process: An Examination of the Potential of Social Media. *World Journal of English Language*, *12*(7), 69–75. https://doi.org/10.5430/wjel.v12n7p69

Abendroth, K. J. (2024). Using Multiliteracies to Target Critical Media Literacy for Adolescents with Language Learning Disabilities. *Topics in Language Disorders*, *44*(2), 83–95. https://doi.org/10.1097/TLD.0000000000000337

Ainscow, M. (2020). Inclusion and equity in education: Making sense of global challenges. *Prospects*, *49*(3–4), 123–134. https://doi.org/10.1007/s11125-020-09506-w

Al-Hail, M., Zguir, M. F., & Koç, M. (2024). Exploring Digital Learning Opportunities and Challenges in Higher Education Institutes: Stakeholder Analysis on the Use of Social Media for Effective Sustainability of Learning–Teaching–Assessment in a University Setting in Qatar. *Sustainability (Switzerland)*, *16*(15). https://doi.org/10.3390/su16156413

Andi, H. K., Senbagam, S., Sharma, D. K., Shelke, M., Kumar, N. K. S., & Poonia, R. C. (2023). A Machine Learning Model for Augmenting the Media Accessibility for the Disabled People. In *2023 International Conference on Communication, Security and Artificial Intelligence, ICCSAI 2023* (pp. 438–443). https://doi.org/10.1109/ICCSAI59793.2023.10420881

Andrian, R. A., Yasin, A., Hanan, M. R. I., Ramadhan, M. I., Ridwan, T., & Hikmawan, R. (2022). Development of a Digital Platform Prototype, to Facilitate Inclusive Learning for Children with Special Needs. *Jurnal Online Informatika*, *7*(2), 161–167. https://doi.org/10.15575/join.v7i2.835

Chen, C., & Aleem, M. (2024). A model for new media data mining and analysis in online English teaching using long short-term memory (LSTM) network. *PeerJ Computer Science*, *10*. https://doi.org/10.7717/peerj-cs.1869

Daniel, J. (2025). The academic achievement gap between students with and without special educational needs and disabilities. *European Journal of Special Needs Education*, *40*(3), 539–556. https://doi.org/10.1080/08856257.2024.2400771

Efrina, E., Marlina, Maulina, Y., & Helsa, Y. (2019). Improving place value ability for children with learning disability using balok pelangi ienes as Media. In *Journal of Physics: Conference Series* (Vol. 1321, Issue 3). https://doi.org/10.1088/1742-6596/1321/3/032007

Ekwok, L. N., Lawson, E. E., Pepple, I. I., Ngwu, U. I., Nakanda, E. V., Okoro, L. A., Ekeng, E. B., Lawrence, E. M., Arop, L. O., Eyo, A. P., Otu, O. O., Ariche, C. K., Ogbaji, O. P., Clement, I. B., Agbongiasede, C. K., & Amalu, N. S. (2025). Utilization of Social Media Networks for Teaching Effectiveness in Tertiary Institutions of Cross River State, Nigeria: Implications for Learning and Practice in an Environment of Students with Intellectual Disabilities. *Journal of Intellectual Disability - Diagnosis and Treatment*, *13*(1), 67–84. https://doi.org/10.6000/2292-2598.2025.13.01.7

Erliani, Y., Herdi, T., & Jumaryadi, Y. (2025). *Penerapan Media Pembelajaran Interaktif untuk Sekolah Inklusi*. *02*(02), 48–52. https://doi.org/10.70404/orahua.v2i02.111

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

Finandhita, A., & Octaviana, G. (2023). Interaction Design of Number Counting Operation Learning Media for Mildly Mentally Retarded Children. In *INCITEST 2023 - Proceedings of the 2023 International Conference on Informatics Engineering, Science and Technology*. https://doi.org/10.1109/INCITEST59455.2023.10397032

Frisch, H., Ratz, C., Warmdt, J., & Pohlmann-Rother, S. (2025). "Hands on iPad" – How do students with intellectual disability participate in media aspects of digital and inclusive teaching? *Research in Developmental Disabilities*, *160*. https://doi.org/10.1016/j.ridd.2025.104961

Furuya, M. T. G., Furuya, D. E. G., de Oliveira, L. Y. D., da Silva, P. A., Cicerelli, R. E., Gonçalves, W. N., Junior, J. M., Osco, L. P., & Ramos, A. P. M. (2023). A machine learning approach for mapping surface urban heat island using environmental and socioeconomic variables: a case study in a medium-sized Brazilian city. *Environmental Earth Sciences*, *82*(13). https://doi.org/10.1007/s12665-023-11017-8

Huda, A., Sari, L. M., Effendi, H., Giatman, M., Firdaus, & Sukmawati, M. (2025). Canva-based Animation Comic Video Media in Informatics Learning at SMP Negeri 14 Padang. *International Journal on Informatics Visualization*, *9*(1), 120–127. https://doi.org/10.62527/joiv.9.1.3177

Jones, C. T., Collins, K., & Zbitnew, A. (2022). Accessibility as Aesthetic in Broadcast Media: Critical Access Theory and Disability Justice as Project-Based Learning. *Journalism and Mass Communication Educator*, *77*(1), 24–42. https://doi.org/10.1177/10776958211000198

Juhanaini, J., Rizqita, A. J., Bela, M. R. W. A. T., Hernawati, T., Qolbi, I. N., & Khimmataliyev, D. O. (2025). Android-Based Technology: Development of Game-Based Learning Media Based on the Results of Analysis of Arithmetic Learning Difficulties. *Journal of Advanced Research in Applied Sciences and Engineering Technology*, *48*(1), 1–28.

Juhanaini, J., Rizqita, A. J., Bela, M. R. W. A. T., Suherman, Y., Ratnengsih, E., & Ratmaningsih, N. (2024). Game-Based Learning Media on System of Units Material Based on Assessment Analysis Results for Children With Mathematics Learning Difficulties. *Journal of Engineering Science and Technology*, *19*(4), 1302–1328.

Krasavina, Y. V., Ponomarenko, E. P., Shishkina, A. A., & Gareev, A. A. (2023). Learning experiences of deaf and hard-of-hearing students in digital media: a literature review. In *Perspektivy Nauki i Obrazovania* (Vol. 66, Issue 6, pp. 317–331).

Kumia, S., Snowb, C., Marfo-Gyimahc, J., Lomoteyb, R. K., & Detersa, R. (2024). Using Machine Learning to Track Disability Discourse on Social Media. In *Proceedings - 2024 IEEE International Conference on Digital Health, ICDH 2024* (pp. 141–150).

Kusmawati, A. P., Fahrurrozi, F., & Supena, A. (2023). Increasing Concentration of Attention Deficit Hyperactivity Disorder (ADHD) Students Through Gamification Learning Media in Indonesian Inclusion Elementary School. *International Journal of Special Education*, *38*(1), 169–184. https://doi.org/10.52291/ijse.2023.38.15

López Fuentes, A. V. (2024). Student voices in creative teaching practices with digital media: a meta-ethnographic research. *Ethnography and Education*, *19*(4), 411–429.

Mukundan, T. M. V., Gadhiya, A., Nadar, K., Gagrani, R., & Basha, N. K. (2024). A Media-Pipe Integrated Deep Learning Model for ISL (Alphabet) Recognition and Converting Text to Sound with Video Input. In *Communications in Computer and Information Science: Vol. 2065 CCIS* (pp. 267–282). https://doi.org/10.1007/978-3-031-68639-9_17

Murire, O. T., & Cilliers, L. (2019). Critical success factors to improve the adoption of social media in teaching and learning: A case study at a traditional university. *International Journal of*

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.

Interactive Mobile Technologies, *13*(3), 81–94. https://doi.org/10.3991/ijim.v13i03.8485

O'Toole, J. (2023). Identifying creative and participatory approaches to respond to existing challenges for Irish language teaching and learning at English-medium primary school level. *Irish Educational Studies*, *42*(4), 599–616.

Osuna, A., Tagavi, D., Sabini, K., & Vernon, T. (2023). Socialization, education and learning for the internet (SELFI): development and pilot of a social media skills program for autistic adults. *Advances in Autism*, *9*(4), 402–417. https://doi.org/10.1108/AIA-12-2022-0057

Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *Bmj*, *372*. https://doi.org/10.1136/bmj.n71

Paris, A., Denne, L. D., Grindle, C. F., May, R., Apanasionok, M. M., & Hastings, R. P. (2024). Facilitators and barriers to the implementation of the picture exchange communication system (PECS): a systematic review. *Frontiers in Education*, *9*(June). https://doi.org/10.3389/feduc.2024.1206410

Paul, J., Lim, W. M., O'Cass, A., Hao, A. W., & Bresciani, S. (2021). Scientific procedures and rationales for systematic literature reviews (SPAR-4-SLR). *International Journal of Consumer Studies*, *April*, 1–16. https://doi.org/10.1111/ijcs.12695

Purbasari, Y. A., Hendriani, W. H., & Yoenanto, N. H. (2022). Perkembangan Implementasi Pendidikan Inklusi. *Jurnal Pendidikan (Teori Dan Praktik)*, *7*(1), 50–58. https://doi.org/10.26740/jp.v7n1.p50-58

Rasmitadila, Widyasari, Prasetyo, T., Rachmadtullah, R., & Samsudin, A. (2019). The instructional strategy in inclusive classroom: In inclusive teachers' opinion. *International Journal of Scientific and Technology Research*, *8*(8), 1753–1757.

Rehman, Z. U., Baharun, R., & Salleh, N. Z. M. (2020). Antecedents, consequences, and reducers of perceived risk in social media: A systematic literature review and directions for further research. *Psychology and Marketing*, *37*(1), 74–86. https://doi.org/10.1002/mar.21281

Rustandar, A., & Widinarsih, D. (2023). Metode dan Media Pembelajaran untuk Pendidikan Inklusi bagi Penyandang Autis di Indonesia. *Jurnal Pendidikan Kebutuhan …*, *7*(1), 38–56. https://jpkk.ppj.unp.ac.id/index.php/jpkk/article/view/743

Sailer, M., & Homner, L. (2020). The Gamification of Learning: a Meta-analysis. *Educational Psychology Review*, *32*(1), 77–112. https://doi.org/10.1007/s10648-019-09498-w

Salih, K. M. A., Albaqami, A. A., Jibo, A., Alfaifi, J. A., Al Amri, S. A., Alghamdi, M., Abbas, M., & Ibrahim, M. E. (2022). Social Media Utilization and Its Impact on Male Medical Students' Learning During Covid-19 Pandemic. *Turkish Online Journal of Distance Education*, *23*(2), 140–152. https://doi.org/10.17718/tojde.1096411

Sofi-Karim, M., Bali, A. O., & Rached, K. (2023). Online education via media platforms and applications as an innovative teaching method. *Education and Information Technologies*, *28*(1), 507–523. https://doi.org/10.1007/s10639-022-11188-0

Tomé Klock, A. C., Palomino, P. T., Rodrigues, L. A. L., Toda, A. M., Simanke, S., Spors, V., Santana, B. S., & Hamari, J. (2024). Gamification towards and alongside equity, diversity and inclusion: Looking back to move forward. *New Media and Society*.

Tramontano, C., Barbaranelli, C., Carroll, J., Deluca, M., Enderby, J., Groce, N., & Mont, D. (2025). New approaches to categorising childhood disability: an international comparative analysis of the UNICEF/Washington Group child functioning module. *Disability and Health Journal*, *18*(4), 101855. https://doi.org/10.1016/j.dhjo.2025.101855

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.
[e-**ISSN 2598-5949** | p-**ISSN 2303-1514**]

van Dinter, R., Tekinerdogan, B., & Catal, C. (2021). Automation of systematic literature reviews: A systematic literature review. *Information and Software Technology*, *136*(October 2020), 106589. https://doi.org/10.1016/j.infsof.2021.106589

Vigo-Arrazola, B., & Moreno-Pinillos, C. (2025). Creative and inclusive teaching practices in multigrade schools. An ethnographic study on the use of digital media. *International Journal of Educational Research*, *131*. https://doi.org/10.1016/j.ijer.2025.102596

Primary: Jurnal Pendidikan Guru Sekolah Dasar is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.
[e-**ISSN 2598-5949** | p-**ISSN 2303-1514**]