International Journal of Education, Culture and Society
2026, Vol. 11, No. 4, pp. 110–122
https://doi.org/10.11648/j.ijecs.20261104.11

Review Article

A Bibliometric Analysis of Specific School Programmes for Visually Impaired Students

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Abstract

Educational programs for students with visual impairments play a critical role in promoting inclusive and equitable learning opportunities. Despite growing scholarly interest in this area, a comprehensive understanding of the research landscape remains limited. This study presents a bibliometric analysis of research on school programs for visually impaired students using 513 documents indexed in the Scopus database between 1945 and 2023. The analysis was conducted using performance analysis and bibliographic coupling techniques, supported by Microsoft Excel and VOSviewer. The findings reveal a steady increase in research output, particularly after 2019, reflecting the growing emphasis on inclusive education and technology-enhanced learning. The United States emerged as the leading contributor, followed by the United Kingdom, India, and Australia, while the most influential publication sources included the Journal of Visual Impairment and Blindness and the British Journal of Visual Impairment. Major research themes identified through bibliographic coupling include inclusive education, curriculum adaptation, assessment practices, intervention strategies, physical activity, oral health, psychosocial support, and technology integration. The results highlight the multidisciplinary nature of the field, with contributions from education, medicine, social sciences, psychology, and health professions. The study also identifies geographical and thematic gaps, emphasizing the need for greater international and interdisciplinary collaboration. By mapping key contributors, publication trends, and emerging research directions, this study provides valuable insights for researchers, educators, policymakers, and practitioners seeking to develop more effective and inclusive educational programs for visually impaired learners.

Keywords

Inclusive Education, Bibliometric Analysis, School Programme, Visual Impairment, Assistive Technology, VOSviewer

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Received: 11 June 2026; **Accepted:** 24 June 2026; **Published:** 17 July 2026

1. Introduction

Education is the foundation of human development and social progress, yet its achievement largely relies on the presence or absence of the equal access of everyone to educational opportunities, irrespective of ability or disability [1]. There is a need to have access to quality education to every student regardless of his or her circumstances [2]. The swift progression in 21st century and advancement of technological innovation has influenced instruction and education across all tiers of academia [3, 4]. Similar to their peers, visually impaired students require information and communication technologies to facilitate the transition from classroom education to extracurricular activities, both indoor and outdoor [5]. In today's era, specially-abled students, especially those that are visually impaired, continue to be one of the most excluded and discriminated groups [6]. School children with visual impairment in educational institutions face various academic and social challenges that may fail them negatively and restrict the degree of their engagement [7].

The classroom setting is instrumental in the success of such learners to meet educational objectives and enjoy meaningful social inclusion [8]. Visual impairment gives rise to many practical and cognitive challenges in everyday life, which means that there is a point to consider the particular educational and developmental needs of such population [9]. Furthermore, children and adolescents with disabilities often experience an additional burden of adversities and lack of access to age-related activities, so it is particularly relevant that any specific interventions aimed at increased resilience and equitable participation in the activities are required [10]. Individualized assessments remain a challenge. Teachers face challenges, including dearth of resources, poor classroom environments, and limited government support [11, 12].

Moreover, the current changes in education, occurring due to the pandemic, and an intense digitalization process, as well as the growth of more sophisticated technologies, changed the way learning is delivered and accessed [13]. The standard tools of accessibility usually do not provide a complex visual representation, e.g., diagrams, so limiting the access to academic and professional content [14]. Nevertheless, new technologies, especially those that rely on artificial intelligence and machine learning, can provide new solutions, as they can support such features as real-time object detection and voice feedback, thus, facilitating independent learning and minimizing the barriers to learning [15]. Assistive technology has advanced swiftly and continues to progress for visually impaired students [16]. The integration of visually impaired individuals into mainstream education and employment is crucial for fostering an inclusive society. Nevertheless, it has been reported that visually impaired students encounter numerous obstacles in accessing and utilising educational and employment opportunities [17].

Meanwhile, drop rates remain high and ongoing challenges, in particular, with laboratory-based courses, have restricted access to some disciplines [18]. The trends in research show that there is a slow transition between the use of tactile media and Braille-based materials to more holistic and technology-oriented ones that facilitate conceptual knowledge through the aid of accessible digital resources [19]. Interactive combination of IT network applications, enhancement of digital interface, haptic systems, and collaborative systems have been proved to help create an environment of inclusive learning that can assist both blind and typical students [20]. However, sensory impaired students all over the world continue to have to contend with significant barriers such as a lack of access to adapted content, communication barriers, and physical and social space [21]. The immediate need to work on the issue is especially notable in the case of India, at which the proportion of visually impaired population is a major fraction of the worldwide blind community, so the inclusion of educational strategies is a necessary social priority [22].

Special students also require opportunities to enable them to complete all the milestones in their life and achieve whatever they want [23]. Various policies and frameworks are used in the world to underline the significance of including students with visual impairments [24]. Yet, the bibliometric analysis on the school programmes of visually impaired students has not been conducted. Bibliometrics is a term that was coined by Pritchard (1969) and implies the use of mathematical and statistical tools to analyse articles and other means of communication, making it possible to conduct a thorough assessment of how certain topics develop [25]. This method of analysis lowers the bias of the researcher because it gives a broad overview of the reviewed field [26]. Among the main advantages of bibliometric analysis, objectivity, along with the possibility to work with huge volumes of data, is accepted by researchers [27]. Initially, bibliometric analysis has transcended disciplinary boundaries and all scholars in diverse academic fields appreciate its role in exploring the development of a myriad of subjects [28]. The purpose of this paper was to find the gap in the research concerning a particular school program with visually impaired students with a comprehensive bibliometric review. Through the analysis of the scholarly networks and the world trends in this area, this study aimed at revealing information on development, implementation, and success of such programs. The research was set on articles that were published in the period of 1945-2023 and had high citations by the Scopus database. The aims comprised the assessment of output on publications, author key words, most prolific journals and institutions, author contribution as well as country-based research activities. The research questions that will be used in carrying out this bibliometric analysis are as follows: RQ1: What is the type of documents and sources? RQ2: Which is the productivity of the research? RQ3: Which are the most active journals that publish papers? RQ4: Which institutions are the most influential to this field? RQ5: How is the geographical distribution of publications by country? RQ6: What are the most active authors?

2. Literature Review

2.1. Bibliometric Mapping

"Bibliometrics" refers to a set of methods for conducting quantitative evaluations of academic literature [29]. In library and information science, "citation analysis" is the most commonly used bibliometric technique [30]. Furthermore, bibliometric methodologies are utilised in all research fields to analyse the impact of their publications, research, institutions, regions, and individual researchers, as well as the effect of their work [31]. To gather bibliographic information, search the Web of Science and Scopus databases by topic, author, journal, and time frame [32]. For the past 20 years, scientific ecosystem trends, conceptual and intellectual maps, and well-known authors have all been evaluated in educational contexts using quantitative analysis of publication and citation data [33]. Prior to the creation of the Science Citation Index in 1961, all computations were done by hand, which took a lengthy time [34]. With the use of automated algorithms, the technique became much more widespread, adaptable, and useful. As a result, a new field, computational bibliometrics, emerged. CiteSeer created the first automatic citation extraction and indexing system [35].

2.2. Visualisation of Similarities (VOSviewer)

Less than 20 years ago, the idea of VOS ("visualisation of similarities") was established for the purpose of analysing and visualising patterns within data [36]. Many bibliometric and citation studies have adopted the VOS concept years later, when it was developed into a programme called VOSviewer for bibliometric analysis [37]. This programme allows researchers, journals, or individual publications to be actors in bibliometric networks that are constructed and visualised based on co-citation, bibliographic coupling, or co-authorship relations [38]. VOSviewer's distinguishing feature is the ability to display large bibliometric maps. For example, it can generate author or journal maps based on co-occurrence, co-citation, and keyword data [39]. VOS also has the advantage of being applicable to more than 100 items. The VOS mapping method, which is fully incorporated into VOSviewer, is extremely effective for making and viewing maps [40]. There are three types of visualisations that can be displayed: network, overlay, and density [39]. However, just the network visualisation was created and examined for this study.

2.3. Scopus Database

With extensive coverage of scientific journals, conference proceedings, and books both locally and internationally, Scopus is one of the largest curated abstract and citation databases [41]. An independent Content Selection and Advisory Board rigorously select and re-evaluates content to ensure that only the best data are indexed [42]. For this study, the Scopus database was searched using keywords applicable to this article.

2.4. Definitions of Visual Impairment and Specific School Programme

The World Health Organization (WHO) defines visual impairment as "a decrease in the ability to see to a certain degree that causes problems not fixable by usual means, such as glasses or contact lenses." This definition implies that visual impairment includes a range of conditions that result in reduced vision or blindness [43]. Additionally, students with visual impairments have varying degrees of vision-use for tasks that typically require vision [44]. While some individuals have to use other channels (e.g., auditory and tactile ones) to acquire information, others use vision but only to supplement information acquired through other channels [45]. Another category of people with visual impairments includes those who primarily utilise their eyes to collect input that is generally acquired by vision but supplement it with input from tactile, auditory, and other senses [46]. They encounter endless obstacles owing to visual loss, and a variety of issues and challenges requires careful attention in the implementation of curriculum, specific programs, and instructional approaches in order to achieve excellent academic accomplishment [47]. Specific school programs refer to structured educational initiatives designed to address particular needs, interests, or goals within a school setting. These can include remedial education programs for students needing extra help, enrichment programs for gifted students, specialized programs for students with disabilities, vocational training programs, and extracurricular activities such as sports, arts, and clubs [48].

3. Materials and Methods

The data in this analysis were established by searching 513 documents on the Scopus database. Although several databases are widely available, the bibliometric analysis in this research is based entirely on Scopus databases. In addition, to create sample articles for the analysis, specific keywords were utilized as search terms, namely "School program" OR "School Intervention" OR "Scaffolding Program" OR "special school" OR "education program" AND "Visually Impaired" OR "Visual impairment" OR "low vision" OR "blind student". Network visualization and bibliometric indicators will be illustrated to answer the research questions. Scopus uses rigorous original metadata to associate people, published theories, and institutions. By using refined tools and analytics, Scopus creates accurate citation outcomes and comprehensive researcher profiles. Documents published between 1945 and 2023 were retrieved for analysis. This research employed the stepwise procedure outlined by Donthu et al. [49] for conducting bibliometric performance analysis which is illustrated in Table 1. Beginning with defining the objectives and scope of

the analysis, the study establishes the boundaries of the research topic. Next, it rationalizes the selection of methodologies customised to fulfil these objectives and scope. Subsequently, the study describes the data collection process for the bibliometric analysis. Finally, the quantitative analysis extracts valuable insights from the data under examination.

Table 1. *Steps of conducting bibliometric analysis.*

Step	Title
Step 1	Definition of the aims and scope of the bibliometric study
Step 2	Choice of techniques for bibliometric analysis
Step 3	Collection of data for bibliometric analysis
Step 4	Analysis and findings discussion

3.1. Bibliometric Analysis

Bibliometrics, coined by Pritchard (1969), entails the application of mathematical and statistical methods to scrutinize articles and various communication mediums, enabling a comprehensive evaluation of the development of specific subjects [25]. This analytical approach serves to diminish researcher bias, offering a universal perspective of the reviewed domain [26]. One of the primary advantages of bibliometric analysis is its objectivity, coupled with its adeptness at handling large volumes of data, a feature widely acknowledged by scholars [50]. The key procedures commonly implemented in bibliometric studies are a performance analysis and science mapping [51]. (1) Performance analysis: Evaluating publication trends within a research field. It examines the productivity and impact of various elements, such as authors, journals, organizations, and countries [49]. (2) Science Mapping: Science mapping examines the relationships between research constituents. The analysis pertains to the intellectual interactions and structural connections among research constituents [52]. The techniques for science mapping include citation analysis, co-citation analysis, bibliographic coupling, co-word analysis, and co-authorship analysis [53]. In this study, performance analysis and bibliographic coupling are conducted.

3.2. Source and Data Collection

On 14th April 2024, the Scopus database was searched using the search keyword "specific school programmes for visually impaired students" in the article title box. Overall, 513 documents were produced for further inquiry. The retrieval data from the Scopus database was exported in CSV format for further study. The Scopus documents were analysed using software such as Microsoft Excel and VOSviewer. Microsoft Excel was utilised to construct acceptable graphical representations, and VOSviewer (version 1.6.15) was used for bibliographic coupling.

4. Results

The findings of the study include information on various types of documents and sources, research productivity, subject area, most active journals, geographical distribution of publications, number of authors per document, most active authors, most prominent institutions, and bibliographic coupling. Visualisation maps were also used to improve keyword analysis, explain the geographical distribution of publications, the number of authors per document, the most influential institutions, the geographical distribution of publications, and the most cited articles/papers via Scopus.

4.1. Performance Analysis

Performance Analysis evaluates publication trends within a research field. It examines the productivity and impact of various elements, such as authors, journals, organizations, and countries [49].

Table 2. *Documents by Affiliation.*

Rank	Affiliation	Publications
1	University of Birmingham	12
2	University of Hong Kong	10
3	Vanderbilt University	9
4	Göteborgs Universitet	8
5	Universidade de São Paulo	7
6	University of Arizona	7
7	Texas Tech University	6
8	Western Michigan University	6
9	Hunter College	5
10	University of Melbourne	5
11	University of Wisconsin	5
12	University of North Carolina	4
13	Michigan State University	4
14	University of Texas	4

An examination of universities' contributions to research on visually impaired students and educational programs reveals a diversified and vibrant scholarly ecosystem. The University of Birmingham had the most publications, showing a strong effect on scholarly debate in this topic. The University of Hong Kong and Vanderbilt University both produced significant research outputs, with Vanderbilt's Peabody College focussing

on novel educational solutions for the visually handicapped. Göteborgs Universitet, Universidade de São Paulo, and The University of Arizona presented distinct perspectives and methods to inclusive education. Texas Tech University, Western Michigan University, and Hunter College all enhanced their understanding and methods in education programs for visually impaired students. Together, these universities exhibited a significant commitment to addressing the educational needs of visually impaired individuals through research-driven programs.

4.2. Documents by Author

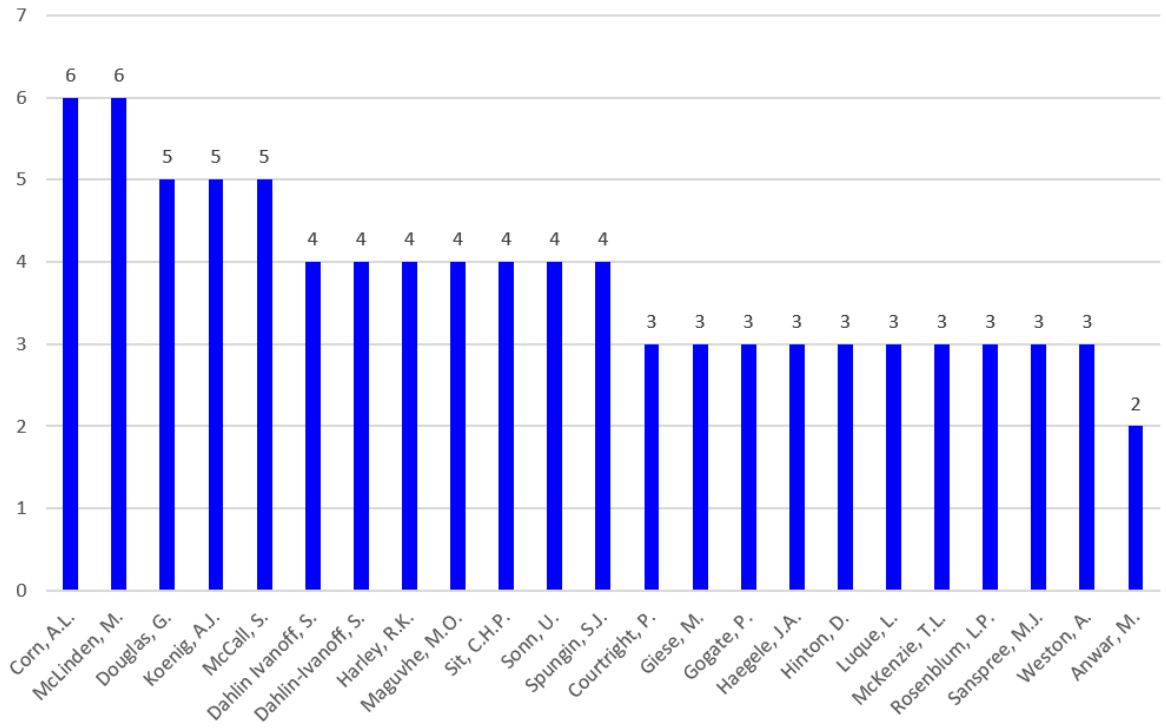

Figure 1. *Documents by Author.*

Figure 1 revealed notable writers who made major contributions to vision impairment research and educational initiatives. A. L. Corn and M. McLinden lead with six articles apiece, demonstrating their substantial participation and competence. G. Douglas, A. J. Koenig, and S. McCall followed closely with five papers each, demonstrating their significant contributions. S. Dahlin Ivanoff, R. K. Harley, M. O. Maguvhe, C. H. P. Sit, U. Sonn, and S. J. Spungin, all of whom have four publications, have consistently dedicated themselves to this specialised subject. Collectively, these authors have played critical roles in developing conversations, interventions, and policies about vision impairment in educational settings.

4.3. Documents by Country

Table 3. *Top 14 Countries by Publications.*

Rank	Country	Publications
1	United States	193
2	United Kingdom	62
3	India	31
4	Australia	19
5	South Africa	16
6	Germany	14
7	Canada	12
8	China	11
9	Indonesia	10
10	Japan	9
11	Brazil	8
12	Sweden	8
13	Turkey	8
14	Hong Kong	8

The bibliometric analysis of publications on visually impaired students and educational programs, classified by nation or territory, revealed the United States as the largest contributor with 193 publications, indicating significant research investment in this area. The United Kingdom, India, and Australia also demonstrated significant participation, with 62, 31, and 19 publications, respectively. South Africa, Germany, and Canada produced 16, 14, and 12 publications, respectively. China, Indonesia, Japan, Brazil, Sweden, Turkey, Hong Kong, and the Russian Federation had varied degrees of interest. This distribution demonstrates the worldwide interest and efforts to develop knowledge and practices connected to vision impairment and educational programs.

4.4. Type of Document

Table 4. Document Type.

Document Type	Count
Article	402
Review	47
Conference Paper	34
Editorial	17
Short Survey	13
Book Chapter	9
Letter	4
Note	4
Book	1

The scholarly environment in the fields of visual impairment and educational programmes is broad and diversified, as evidenced by the distribution of publications by document type. Articles account for 402 of the contributions, which suggests a solid body of research literature including theoretical frameworks, empirical investigations, and useful treatments. Reviews (47) help both academics and practitioners by offering insightful summaries and evaluations of the body of research. While book chapters (9), editorials (17), and short surveys (13), provide commentary, in-depth debates, and quick evaluations on certain issues, conference papers (34) provide insights into ongoing research and new trends. Together, these varied document types enrich the knowledge base on visual impairment and educational programs, catering to the needs of researchers, educators, policymakers, and individuals with visual impairments.

4.5. Documents by Source

Table 5. List of journals publishing most numbers of documents on VI and school programs.

Rank	Source	Count
1	Journal of Visual Impairment and Blindness	135
2	British Journal of Visual Impairment	24
3	European Journal of Special Needs Education	11
4	Research in Developmental Disabilities	8
5	Indian Journal of Ophthalmology	7
6	British Journal of Ophthalmology	6
7	Disability and Rehabilitation	6
8	Archives of Disease in Childhood	5
9	Clinical Ophthalmology	4
10	Investigative Ophthalmology and Visual Science	4

A review of published sources in the field of vision impairment and educational programs finds a wide range of contributing publications. The "Journal of Visual Impairment and Blindness" ranks first with 135 documents, indicating it as the leading venue for research in this field. The "British Journal of Visual Impairment" follows with 24 documents and also plays an important role. The "European Journal of Special Needs Education" and "Research in Developmental Disabilities" had 11 and 8 documents, respectively, emphasising the focus on special education needs and developmental impairments associated with vision impairment. Other significant periodicals include "Indian Journal of Ophthalmology," "British Journal of Ophthalmology," and "Disability and Rehabilitation," each with 7, 6, and 6 documents. Overall, the data underscores the breadth and depth of literature on visually impaired students and school programs, emphasizing the importance of multidisciplinary collaboration and research dissemination in this field.

4.6. Documents by Subjects

Table 6. Documents by Subject Area.

Rank	Subject Area	Count
1	Medicine	374
2	Social Sciences	92
3	Health Professions	51

Rank	Subject Area	Count
4	Psychology	49
5	Computer Science	22
6	Engineering	20
7	Neuroscience	20
8	Nursing	6
9	Dentistry	4
10	Biochemistry, Genetics and Molecular Biology	3

The examination of subject categories in research on visually impaired students and educational programs finds that Medicine receives the most documents (374), emphasising diagnosis, treatment, and management. Social Sciences (92 documents) and Health Professions (51 documents) play important roles, demonstrating a multidisciplinary approach. Psychology (49 documents) emphasises the significance of meeting psychological and socio-emotional needs. Contributions from Computer Science, Engineering, and Neuroscience (22, 20, and 20 documents, respectively) highlight the importance of technological and scientific developments in producing assistive educational programs. Lower mentions in Arts and Humanities, Environmental Science, Mathematics, and Business indicate possibility for more interdisciplinary investigation to increase educational opportunities for visually impaired people.

4.7. Documents by Year Wise

Table 7. *Year wise frequency of documents (2005-2023).*

Year	Publications	Year	Publications
2005	8	2015	16
2006	9	2016	18
2007	10	2017	20
2008	8	2018	22
2009	11	2019	29
2010	9	2020	25
2011	12	2021	32
2012	13	2022	28
2013	14	2023	30
2014	15		

The data from 2005 to 2023 reveals consistent interest in research on visually impaired students and educational programs, with fluctuating publication frequencies. Notable peaks in 2021 and 2019, with 32 and 29 publications respectively, indicate periods of heightened research activity. Lower frequencies in years like 2010 and 2008 suggest occasional dip. Overall, the sustained presence of publications underscores the ongoing importance of addressing the educational needs of visually impaired students, reflecting shifts in research priorities, funding, and advancements in the field.

4.8. Bibliographic Coupling

Bibliographic coupling involves identifying connections between documents based on their shared citations, thus highlighting conceptual similarities [54]. This method also takes into account recently published articles, which may have fewer citations. A document is considered bibliographically coupled if it appears in the references of two or more other documents [54]. This approach is useful for uncovering clusters of related research through co-citation analysis, which focuses on content similarity [55]. In this study, articles published in 2000 and after selected for bibliographic coupling. There are nine clusters in bibliographic coupling and each cluster had relationship in terms of area and theme which are as follows:

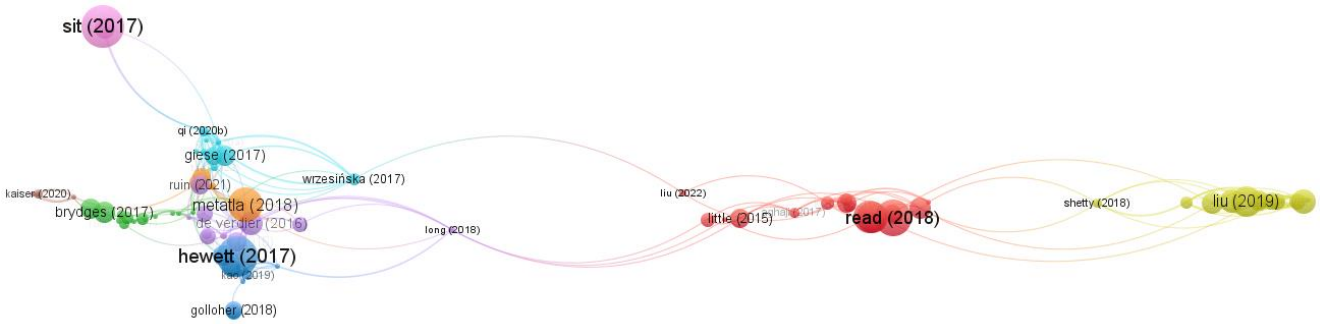

Figure 2. *Bibliographic coupling of documents.*

Cluster 1 (19 papers): Visual impairment in children with disabilities, particularly in special schools or rehabilitation centers. Cross-sectional studies on dual sensory impairment and ocular and functional vision impairment in children with multiple disabilities examined the prevalence, effect, and interventions for visual impairment. They stressed the importance of full evaluations in early intervention and examined how impaired eyesight affects literacy and schooling. The cluster shed light on the prevalence, impact, and interventions of visual impairment in children with disabilities, emphasizing the need for early detection and intervention to improve quality of life and educational outcomes.

Cluster 2 (14 articles): Inclusive education for visually impaired pupils in Nigeria, South Africa, Lebanon, Lesotho, Chile, Myanmar, and China. The investigations showed that inclusive education policies are not implemented well, with poor instructional support and discriminatory attitudes. South African visually impaired students have poor learning circumstances, highlighting the need for policy reforms. Ambiguity in inclusive education in Lebanon required more study, financing, teacher training, and community involvement.

Cluster 3 (13 articles): Education for visually impaired individuals, covering legislative frameworks, teaching methods, and technological use. Highlights included the variation in the Expanded Core Curriculum (ECC) in Individualized Education Programs (IEPs) among U.S. jurisdictions and the necessity for TPACK in Lesotho pre-reading instruction. Studies examined effective educational interventions including self-determination and human anatomy teaching approaches, emphasizing the necessity for vision impairment-specific research.

Cluster 4 (13 articles): Oral health and oral hygiene instruction for visually impaired people. A comprehensive oral health education program in New Delhi employing audio aids and Braille publications improved children's oral hygiene. Similar successes were observed in Bengaluru and northeast China. Research in Yemen and northeast China found high dental cavities and poor oral hygiene among visually impaired children and adolescents.

Cluster 5 (11 articles): Education and inclusion for visually impaired individuals (VI), focusing on science, mathematics, physical education, and music. Accessibility, adaptive teaching approaches, and Project-Based Learning were stressed in the cluster as STEM education challenges and opportunities. Cognitive behaviour therapy studies for VI children sought to tailor interventions to specific issues and anxiety.

Cluster 6 (9 articles): Health outcomes and experiences of individuals with visual impairments (VI) in physical education (PE) and physical exercise. The studies examined inclusion, teacher support, and peer interactions in PE contexts. Physical activity improves well-being, according to research. Practical actions and advocacy included developing checklists for parents to address PE in IEPs.

Cluster 7 (6 research): Interventions and educational programs to improve attitudes and abilities for individuals with visual impairments (VIs). These interventions increased VI-positive attitudes, service competency, and clinical practices. Results showed significant improvements in disability attitudes, sports adaption acceptability, and physical education inclusion.

Cluster 8 (4 articles): Educational visual impairment testing and rehabilitation. Studies have found that visually challenged teachers do not standardize functional vision assessment (FVA) procedures, highlighting the need for consensus on assessment methods and abilities. These studies underscore the importance of standardized testing, interdisciplinary teamwork, and evidence-based interventions.

Cluster 9 (2 studies): School-based physical activity (PA) and sedentary time (ST) in disabled children. Both studies used accelerometry to assess PA and ST during physical education, playtime, and luncheon. The findings highlight the necessity to increase educational physical activity.

The results section should provide an accurate and concise description of the experimental findings, and the resulting conclusions that can be inferred from the experiments. Meanwhile, the results should be presented in a transparent and truthful manner, avoiding any fabrication or improper manipulation of data. Where applicable, results of statistical analysis should be included in the text or as tables and figures.

5. Discussion

This bibliometric study provides a comprehensive overview of research on educational programs for visually impaired students. The findings show that interest in this field has increased considerably over time, especially after 2019. This trend is consistent with broader bibliometric analyses, which have documented a significant rise in academic publications on visual impairment and education, driven by both pedagogical and technological shifts [57, 59]. The rise in publications may be linked to the growing emphasis on inclusive education and the increased use of digital technologies in teaching and learning. The COVID-19 pandemic further accelerated the adoption of technology-based educational practices, encouraging researchers to explore innovative ways of supporting visually impaired learners [56]. The pandemic acted as a catalyst, exposing both the potential and the significant gaps in digital accessibility for these students [58, 59].

The analysis identified several major research themes. The largest clusters focused on inclusive education, curriculum adaptation, assessment practices, intervention strategies, and physical activity. These findings suggest that researchers are increasingly concerned not only with academic achievement but also with the overall development and well-being of visually impaired students. The presence of clusters related to oral health, STEM education, and psychosocial support further highlights the multidisciplinary nature of the field. This broad

scope reflects the complex needs of visually impaired learners, where educational success is intertwined with social, emotional, and even physical health factors [57]. For instance, the focus on STEM education confirms a growing effort to make traditionally visual subjects like science and mathematics more accessible through tactile and auditory methods [57].

The bibliographic coupling analysis also revealed that research remains fragmented across different thematic areas. Although each cluster contributes valuable knowledge, limited connections exist among them. Greater collaboration across disciplines could help researchers develop more comprehensive educational programs that address the academic, social, emotional, and physical needs of visually impaired learners. This fragmentation is a common challenge identified in the literature, suggesting that while specialized knowledge is growing, a more integrated approach is needed [57]. Such cross-disciplinary collaboration could bridge the gap between technological innovation and pedagogical practice [58, 60].

The results also indicate notable geographical disparities. The United States and the United Kingdom dominate the research output, while many developing countries remain underrepresented despite having large populations of visually impaired individuals. This imbalance highlights the need for greater research investment and international collaboration in regions where educational challenges may be most significant. This geographic concentration is a persistent pattern in the field, with studies consistently showing that developed nations lead in publication output and international collaborations [57, 59]. The underrepresentation of developing countries is a critical concern, as these regions often lack the infrastructure and resources to implement inclusive educational practices [59].

Another important finding is the relatively limited contribution of technology-related disciplines such as computer science and engineering. Given the rapid development of assistive technologies, artificial intelligence, and digital learning tools, stronger collaboration between education specialists and technology developers could lead to more effective and accessible learning environments for visually impaired students. Recent studies have emphasized the transformative potential of emerging technologies, including AI-driven tools, immersive platforms, and extended reality, yet also highlight that their integration into educational practice is still in its early stages [58, 60, 61]. The limited contribution of these disciplines in the research corpus suggests a need for more applied, cross-disciplinary work to realize this potential [60, 61].

Overall, the findings suggest that successful educational programs for visually impaired learners should combine inclusive policies, curriculum adaptations, assessment practices, technological support, and attention to students' social and emotional well-being. Such an integrated approach can better support the diverse needs of learners and promote meaningful educational participation. This conclusion aligns with the principles of Universal Design for Learning (UDL) and the social model of disability, which advocate for systemic changes that remove barriers and proactively design for accessibility [57, 60]. An integrated, multi-faceted strategy is essential to ensure that visually impaired students are not just present in educational settings but are active, supported, and empowered participants [57, 58, 60].

6. Conclusions

This study provides a comprehensive bibliometric overview of research on educational programs for visually impaired students based on publications indexed in the Scopus database. The findings reveal a growing scholarly interest in this field, particularly in recent years, reflecting the increasing global emphasis on inclusive education and the integration of innovative educational practices. The analysis identified the most influential authors, institutions, countries, and publication sources, while also mapping the intellectual structure of the field through nine major thematic clusters. The results demonstrate that research on educational programs for visually impaired learners has evolved from a predominantly clinical focus toward broader educational concerns, including inclusive education, curriculum adaptation, assessment practices, physical activity, psychosocial support, and technology-enhanced learning. At the same time, the bibliographic coupling analysis highlights a fragmented research landscape, indicating the need for greater interdisciplinary collaboration and stronger integration across thematic areas.

This study contributes to the literature by offering a systematic mapping of the field and identifying key research trends, influential contributors, and emerging directions for future investigation. The findings may assist researchers, educators, policymakers, and program developers in understanding the current state of knowledge and in designing more effective and inclusive educational interventions for visually impaired learners. Despite its contributions, the study is limited by its reliance on a single database and its focus on indexed scholarly publications. Future research should incorporate additional databases, grey literature, and non-English publications to provide a more comprehensive understanding of the field. Further studies may also explore specific thematic clusters in greater depth and examine how educational programs can better respond to the diverse academic, social, and technological needs of visually impaired students. Ultimately, continued collaboration among researchers, practitioners, policymakers, and visually impaired individuals will be essential for advancing inclusive and equitable educational opportunities worldwide.

Abbreviations

VI	Visual Impairment
WHO	World Health Organization
ECC	Expanded Core Curriculum
IEP	Individualized Education Program
TPACK	Technological Pedagogical Content Knowledge

Acknowledgments

The authors acknowledge the Department of Educational Studies, Jamia Millia Islamia, New Delhi, for providing academic support and access to resources.

Author Contributions

Mohd Shahbaz Khan: Data curation, Formal Analysis, Writing – original draft
Sameer Babu M: Supervision, Validation
Suharti: Writing – review & editing
Erwin Rahayu Saputra: Writing – review & editing
Nayab Parveen: Writing – review & editing

Data Availability Statement

The data used in this analysis are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare no conflicts of interest.

References

[1] Medina-Garc á, M., Do ña-Toledo, L., & Higueras-Rodr guez, L. Equal Opportunities in an Inclusive and Sustainable Education System: An Explanatory Model. *Sustainability*. 2020, 12(11), 4626. https://doi.org/10.3390/su12114626

[2] Sahek, D. R. A., & Nasri, N. B. M. A Systematic Review: Access Equality towards Quality Education. *Creative Education*. 2019, 10(12), 2947-2954. https://doi.org/10.4236/ce.2019.1012219

[3] Kalyani, L. K. The role of Technology in Education: Enhancing learning outcomes and 21st century skills. *International Journal of Scientific Research in Modern Science and Technology*. 2024, 3(4), 5-10. https://doi.org/10.59828/ijsrmst.v3i4.199

[4] Morales, M. (2017). Creating the transdisciplinary individual: Guiding principles rooted in studio pedagogy. Journal of Interdisciplinary Studies in Education, 6(1), 28-42. https://ojed.org/jise/article/view/1758

[5] Anselimus, S. M. Assistive Technologies and Participation of Students with Visual Impairments in Extra Curricular Activities - What Does the Literature Say? *American Journal of Interdisciplinary Research and Innovation*. 2023, 2(4), 67-73. https://doi.org/10.54536/ajiri.v2i4.2155

[6] Tahiri, H. The challenges experienced by visually impaired students in Moroccan universities. *International Journal of English Literature and Social Sciences*. 2023, 8(4), 225-232. https://doi.org/10.22161/ijels.84.36

[7] Alsamiri, Y. A. Challenges faced by visually impaired individuals from the perspective of faculty members: A phenomenological study. *Frontiers in Psychology*. 2025, 16, 1651597. https://doi.org/10.3389/fpsyg.2025.1651597

[8] Najmee, N. A. A., Mohammed, Z., Rahman, M. H. A., Fadzil, N. M., Ludin, A. F. M., & Hassan, R. Classroom settings for visually impaired schoolchildren: A scoping review. *PLoS ONE*. 2025, 20(2), e0318871. https://doi.org/10.1371/journal.pone.0318871

[9] Wang, J., Wang, S., & Zhang, Y. Artificial intelligence for visually impaired. *Displays*. 2023, 77, 102391. https://doi.org/10.1016/j.displa.2023.102391

[10] Manitsa, I., & Doikou, M. Social support for students with visual impairments in educational institutions: An integrative literature review. *British Journal of Visual Impairment*. 2020, 40(1), 29-47. https://doi.org/10.1177/0264619620941885

[11] Issa, H. M., & Castulo, N. J. Investigating teaching practices in large classes. *Journal of Interdisciplinary Studies in Education*. 2025, 15(1), 1-28. https://doi.org/10.32674/zr9wew97

[12] Kwapong, O. A. T. F. (2021). Promoting assessment for learning to ensure access, equity and improvement in educational outcomes in Ghana. *Journal of Interdisciplinary Studies in Education*, *10*(SI), 39-56. https://ojed.org/jise/article/view/2910

[13] Ok, Y., & Lee, J. VReport 2.0: Report Generator to Support Independent Learning for the Visually Impaired Students in Science and Engineering. *Frontiers in Artificial Intelligence and Applications*. 2024. https://doi.org/10.3233/faia241447

[14] Singhal, D., Sultania, C., Madurwar, A., Kabra, M., & Rao, M. Braille on Mouse - Enhancing Accessibility of Digital Education for Visually Challenged. In *2024 IEEE International Conference on Computer Applications and Electronics Engineering*. 2024. https://doi.org/10.1109/iccae59995.2024.10569774

[15] De Silva, D. I., Vidhanaarachchi, S., Ranasinghe, R., Jayasooriya, M. N. N. J., Jayawardhana, D. M. P. S., & Savishka, D. K. S. Enhancing Learning Experiences For Visually Impaired Students With AI and Machine Learning on Smart Device. In *2024 IEEE HORA Conference*. 2024. https://doi.org/10.1109/hora61326.2024.10550610

[16] Fteiha, M., Al-Rashaida, M., Elsori, D., Khalil, A., & Bustami, G. A. Obstacles for using assistive technology in centres of special needs in the UAE. *Disability and Rehabilitation Assistive Technology*. 2024, 19(8), 2934-2944. https://doi.org/10.1080/17483107.2024.2323698

[17] Elshemy, R., Alzahrani, F., Fawzy, S., Almasoudi, F., Moussa, Y., & Elsayed, M. (2025). Bridging to possible: Empowering visually impaired students through assistive technology rehabilitative training to become better students and future employees. *Edelweiss Applied Science and Technology*, *9*(4), 1160-1175. https://doi.org/10.55214/25768484.v9i4.6190

[18] Kaufhold, N., & Steinert, J. Work in Progress: Expanding Learning Opportunities in STEM Courses: The Potential of Haptic VR Laboratories for Students with and Without Visual Impairment. In *Springer International Publishing*. 2024, pp. 149-154. https://doi.org/10.1007/978-3-031-52667-1_16

[19] Hidayah, N., Siswanto, J., & Sumarno. (2025). An adaptive activity book in supporting inclusive science learning for Low-Vision students. *Journal of Education Research and Evaluation, 9*(4), 673-680. https://doi.org/10.23887/jere.v9i4.105017

[20] Hakobyan, L., & Grigoryan, N. Innovative solutions for learners with visual impairments. *Armenian Journal of Special Education*. 2024, 8(1). https://doi.org/10.24234/se.v8i1.15

[21] Mustafa, A., Al-Rashaida, M., Al Yaqoubi, A. R. S., & Mustafa, N. K. AI-Powered Interventions Revolutionizing Support for Students With Sensory Impairments. In *Advances in Computational Intelligence and Robotics*. 2025, pp. 221-246. https://doi.org/10.4018/979-8-3373-0573-8.ch008

[22] Kamble, A. P. V App: E College System for Blind Students. *Indian Scientific Journal of Research in Engineering and Managemen*t. 2024, 8(5), 1-5. https://doi.org/10.55041/ijsrem34608

[23] Kaur, S. Inclusive Education: Practices and Challenges. *Journal of Advances and Scholarly Researches in Allied Education*. 2018, 15(8), 68-71. https://doi.org/10.29070/15/57869

[24] Miyauchi, H. A systematic review on inclusive education of students with visual impairment. *Education Sciences*. 2020, 10(11), 346. https://doi.org/10.3390/educsci10110346

[25] Chellappandi, P., & Vijayakumar, C. S. Bibliometrics, Scientometrics, Webometrics/Cybermetrics, Informetrics and Altmetrics - An Emerging Field in Library and Information Science Research. *Shanlax International Journal of Education*. 2018, 7(1), 5-8. https://doi.org/10.5281/zenodo.2529398

[26] Nerur, S. P., Rasheed, A. A., & Natarajan, V. The intellectual structure of the strategic management field: an author co-citation analysis. *Strategic Management Journal*. 2008, 29(3), 319-336. https://doi.org/10.1002/smj.659

[27] Mukherjee, D., Lim, W. M., Kumar, S., & Donthu, N. (2022). Guidelines for advancing theory and practice through bibliometric research. *Journal of Business Research*, *148*, 101-115. https://doi.org/10.1016/j.jbusres.2022.04.042

[28] De Oliveira, O. J., Da Silva, F. F., Juliani, F., Barbosa, L. C. F. M., & Nunhes, T. V. Bibliometric Method for Mapping the State-of-the-Art and Identifying Research Gaps and Trends in Literature: An Essential Instrument to Support the Development of Scientific Projects. *IntechOpen*. 2019. https://doi.org/10.5772/intechopen.85856

[29] Passas, I. (2024b). Bibliometric Analysis: the main steps. *Encyclopedia*, *4*(2), 1014–1025. https://doi.org/10.3390/encyclopedia4020065

[30] Ellegaard, O., & Wallin, J. A. The bibliometric analysis of scholarly production: How great is the impact? *Scientometrics*. 2015, 105(3), 1809-1831. https://doi.org/10.1007/s11192-015-1645-z

[31] Andersen, J., Poli, S., Toom, K., & Miller, P. F. (2018). *Research Management: Europe and Beyond*. Elsevier. https://doi.org/10.1016/C2015-0-00323-9

[32] Pranckutė, R. Web of Science (WoS) and Scopus: The Titans of Bibliographic Information in Today's Academic World. *Publications*. 2021, 9(1), 12. https://doi.org/10.3390/publications9010012

[33] Aria, M., & Cuccurullo, C. bibliometrix: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*. 2017, 11(4), 959-975. https://doi.org/10.1016/j.joi.2017.08.007

[34] King, J. A review of bibliometric and other science indicators and their role in research evaluation. *Journal of Information Science*. 1987, 13(5), 261-276. https://doi.org/10.1177/016555158701300501

[35] Garfield, E. The evolution of the Science Citation Index. *International Microbiology*. 2007, 10(1), 65-69.

[36] Bukar, U. A., Sayeed, M. S., Razak, S. F. A., Yogarayan, S., Amodu, O. A., & Mahmood, R. A. R. A method for analyzing text using VOSviewer. *MethodsX*. 2023, 11, 102339. https://doi.org/10.1016/j.mex.2023.102339

[37] Kirby, A. Exploratory Bibliometrics: Using VOSviewer as a Preliminary Research Tool. *Publications*. 2023, 11(1), 10. https://doi.org/10.3390/publications11010010

[38] Ullah, F., Shen, L., & Shah, S. H. H. Value co-creation in business-to-business context: A bibliometric analysis using HistCite and VOS viewer. *Frontiers in Psychology*. 2023, 13. https://doi.org/10.3389/fpsyg.2022.1027775

[39] Van Eck, N. J., & Waltman, L. Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*. 2010, 84(2), 523-538. https://doi.org/10.1007/s11192-009-0146-3

[40] Raman, A., Thannimalai, R., Don, Y., & Rathakrishnan, M. A Bibliometric Analysis of Blended Learning in Higher Education: Perception, Achievement and Engagement. *International Journal of Learning, Teaching and Educational Researc*h. 2021, 20(6), 126-151. https://doi.org/10.26803/ijlter.20.6.7

[41] Schotten, M., Aisati, M. E., Meester, W. J. N., Steiginga, S., & Ross, C. A. A Brief History of Scopus: The World's Largest Abstract and Citation Database of Scientific Literature. In *Auerbach Publications*. 2017, pp. 31-58. https://doi.org/10.1201/9781315155890-3

[42] Baas, J., Schotten, M., Plume, A., Côté, G., & Karimi, R. Scopus as a curated, high-quality bibliometric data source for academic research in quantitative science studies. *Quantitative Science Studies*. 2020, 1(1), 377-386. https://doi.org/10.1162/qss_a_00019

[43] Burton, M. J., Ramke, J., Marques, A. P., Bourne, R. R. A., Congdon, N., Jones, I., Tong, B. A. M., et al. The Lancet Global Health Commission on Global Eye Health: vision beyond 2020. *The Lancet Global Health*. 2021, 9(4), e489-e551. https://doi.org/10.1016/s2214-109x(20)30488-5

[44] Kv, V., & Vijayalakshmi, P. (2020). Understanding definitions of visual impairment and functional vision. *PubMed*, *33*(110), S16-S17. https://pubmed.ncbi.nlm.nih.gov/34007122

[45] Ghasemi Fard, F., Jalil-Abkenar, S. S., & Ashori, M. The effectiveness of emotional-social skills training on social inclusion of students with visual impairment. *Journal of Visual Impairment and Blindness.* 2023, 117(2), 145-156.

[46] Kiarie, M. W. (2004). Education of students with visual impairments in Kenya: Trends and issues. *International Journal of Special Education (IJSE)*, *19*(2), 16-22. http://files.eric.ed.gov/fulltext/EJ852052.pdf

[47] Agesa, L. J. Challenges faced by learners with visual impairments in inclusive setting. *Journal of Education and Practice*. 2014, 5(29), 185-192.

[48] Toraman, E., & Korkmaz, G. What is the "Meaning of School" to High School Students? A Scale Development and Implementation Study Based on IRT and CTT. *SAGE Open*. 2023, 13(3). https://doi.org/10.1177/21582440231199054

[49] Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*. 2021, 133, 285-296. https://doi.org/10.1016/j.jbusres.2021.04.070

[50] Lim, W. M., & Kumar, S. Guidelines for interpreting the results of bibliometric analysis: A sensemaking approach. *Global Business and Organizational Excellence.* 2023, 43(2), 17-26. https://doi.org/10.1002/joe.22229

[51] Roemer, R. C., & Borchardt, R. Meaningful Metrics: A 21st Century Librarian's Guide to Bibliometrics, Altmetrics, and Research Impact. ALA Editions. 2015.

[52] Chen, H., Tsang, Y., & Wu, C. When text mining meets science mapping in the bibliometric analysis: A review and future opportunities. *International Journal of Engineering Business Management.* 2023, 15. https://doi.org/10.1177/18479790231222349

[53] Dwivedi, R., Nerur, S., & Balijepally, V. Exploring artificial intelligence and big data scholarship in information systems: A citation, bibliographic coupling, and co-word analysis. *International Journal of Information Management Data Insights*. 2023, 3(2), 100185. https://doi.org/10.1016/j.jjimei.2023.100185

[54] Pandey, D. K., Hassan, M., Kumari, V., Zaied, Y. B., & Rai, V. K. Mapping the landscape of FinTech in banking and finance: A bibliometric review. *Research in International Business and Finance*. 2024, 67, 102116. https://doi.org/10.1016/j.ribaf.2023.102116

[55] Boyack, K. W., Small, H., & Klavans, R. Improving the accuracy of co-citation clustering using full text. *Journal of the American Society for Information Science and Technology*. 2013, 64(9), 1759-1767. https://doi.org/10.1002/asi.22896

[56] Adedoyin, O. B., & Soykan, E. Covid-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments*. 2020, 31(2), 863-875. https://doi.org/10.1080/10494820.2020.1813180

[57] Albay, C., & Ilgaz, G. (2025). Reading skills in the visually impaired: Bibliometric trends and thematic analysis. Journal of Interdisciplinary Educational Research, 9(21), 442–459. https://doi.org/10.57135/jier.1728067

[58] Montenegro-Rueda, M., Fernández-Batanero, J. M., & Fernández-Cerero, J. (2022). Impact of ICT on university students with visual impairment. *British Journal of Special Education*, *50*(1), 28-48. https://doi.org/10.1111/1467-8578.12433

[59] Bunju, J. K., & Ndhlovu, D. (2025). Global Trends on adoption of online distance learning and access to higher education institutions for visually impaired students during COVID-19: A bibliometric analysis. *International Journal of Research and Innovation in Social Science*, *IX* (VI), 5428-5445. https://doi.org/10.47772/ijriss.2025.906000414

[60] Smolansky, A., Yang, M., & Azenkot, S. (2024). Towards designing digital learning tools for students with cortical/cerebral visual impairments: Leveraging insights from teachers of the visually impaired. In *ASSETS '24: Proceedings of the 26th International ACM SIGACCESS Conference on Computers and Accessibility*. Association for Computing Machinery. https://doi.org/10.1145/3663548.3675636

[61] Hamash, M., Ghreir, H., & Tiernan, P. (2024). Breaking through Barriers: A Systematic Review of Extended Reality in Education for the Visually Impaired. *Education Sciences*, *14*(4), 365. https://doi.org/10.3390/educsci14040365

Biography

Mohd Shahbaz Khan is a Research Scholar at the Department of Educational Studies, Jamia Millia Islamia, New Delhi, India. He holds a Master of Education (M. Ed.) and a Master of Arts (M. A.) in English. He has qualified the UGC Junior Research Fellowship (JRF) in both English and Education. His research focuses on educational technology, language pedagogy, English for Specific Purposes (ESP), and Education in conflict zone. He has presented his work at various national and international conferences.

Sameer Babu M is an Associate Professor at the Department of Educational Studies, Jamia Millia Islamia, New Delhi, India. He completed his Ph.D. in Educational Technology from the same institution. He has extensive experience in instructional design, online learning, and educational multimedia. He has published numerous research articles in reputed journals and guides doctoral research scholars.

Suharti is a Senior Lecturer in the Department of Early Childhood Education (PAUD) at Universitas Negeri Surabaya (UNESA), Indonesia. She completed her Master of Education (M. Pd.) and Bachelor of Education (S. Pd. I.) in Early Childhood Education. Her current work focuses on early childhood learning strategies, play-based pedagogy, and teacher professional development in early childhood settings.

Erwin Rahayu Saputra is a faculty member at Universitas Pendidikan Indonesia, Bandung, Indonesia. He completed his Master of Education (M. Pd.) and Ph.D. in Educational Technology. His research interests include digital learning media, instructional system design, and technology integration in classroom teaching. He actively contributes to educational technology development projects in Indonesia.

Nayab Parveen is a Ph.D. Research Scholar in the Department of Educational Policy at the National Institute of Educational Planning and Administration (NIEPA), New Delhi. Her research specializes in disability-inclusive higher education, with a particular focus on accessibility, inclusion, and equitable participation of students with disabilities in Indian universities. Her doctoral research examines the impact of physical accessibility and institutional support on the participation of students with disabilities across different higher education institutions.

Research Field

Mohd Shahbaz Khan: Language pedagogy, English for specific purposes (ESP), Children in conflict, English pedagogy, Educational technology, Special education, Inclusive education, Teacher education

Sameer Babu M: Instructional design, Educational multimedia, Online learning, Educational technology, E-learning systems, Distance education, Technology integration

Suharti: Early childhood education, Play-based learning, Child development, Early literacy, Early numeracy, Teacher professional development, Parenting education, Learning strategies

Erwin Rahayu Saputra: Digital learning media, Instructional system design, Technology integration, Educational technology, Classroom teaching, E-learning development, Learning innovation

Nayab Parveen: Disability policy, inclusive education, educational equity, universal design, accessibility audits