Managing visually impaired students through specific school programmes: A review

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Abstract

So as to improve visually impaired students' educational experiences and foster inclusion, it is imperative to assess the effectiveness of school programmes created to meet their specific requirements. Since diversity and inclusion in education are becoming more and more important, it is critical to address the unique difficulties visually impaired children have in regular classroom environments. Reviewing a wide range of internationally implemented programmes, the evaluation focuses on the effects these programmes have on visually impaired students' academic achievement, social integration, and general well-being.The analysis explores the different elements of these programmes, such as specialised teaching methods, assistive technology, and educational materials. It is evident, from this review paper, that academic progress among visually impaired students is positively correlated with the adoption of specific interventions. The paper also examines the social dimensions of inclusion, illuminating the function of awareness campaigns, peer support, and improvements to the school's accessibility as key concerns in school specific programmes for visually impaired students.This study concludes by highlighting the significance of further research and the use of evidence-based approaches in order to provide an inclusive learning environment for students with visual impairments. This study will throw light onto the current conversation on promoting educational equality and inclusivity for all children, regardless of visual ability, by outlining effective techniques and pointing out areas that need more attention.

I.   Introduction

Education is the foundation for the growth of any individual and the development of society, but its effectiveness is mostly dependent on as how the equal access to educational opportunities is available for all or not irrespective of ability or disability (Shields et al., 2023). It is evident that students with special needs also need opportunities so that they can achieve all milestones in their life and achieve whatever they desire. While defining,The World Health Organization (WHO) considered 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.

Students in educational institutions face numerous challenges and problems due to visual impairments, which negatively affect their academic performance. Since most buildings and infrastructure in our society are designed for taking consideration of sighted individuals in mind, it may be hard for most of us to fathom how a blind person manages to live. Similarly, considering how a blind student manages to learn in a classroom equipped with visual aids might be difficult for sighted students. (Dineen, 2003)

Furthermore, the degree to which children with visual impairments use their vision for tasks that normally need vision varies. While some people must obtain information through other channels (such as tactile and auditory ones), others merely need to utilise their eyesight to enhance what they learn from other sources. People who primarily rely on their eyes to get information that is normally obtained via vision but also receive

information through their tactile, auditory, and other senses are another category of people who have visual impairments. (Gargiulo, 2003). They face innumerable problems due to visual loss and innumerable issues and challenges is needed proper focus in implementingthe curriculum, particular programmes, and instructional methods to achieve high academic achievement. (Agesa, 2014). The learner receives insufficient sensory information due to this abnormality, which causes a delay in the acquisition of various abilities through observation of others. This has an effect on the development of language, reasoning, problem-solving, and abstract thought. This ultimately has a significant negative influence on the learner's performance and ability to learn since a pupil is unable to notice and process visual cues to understand a variety of environmental learning scenarios. (Mwakyeja, 2013).

Moreover, a large number of visually impaired students struggle not only to comprehend academic concepts but also to complete assignments and pass exams, which has a negative impact on their academic performance. (Agesa, 2014). The problems and difficulties being faced by the students need to be tackled effectively as students face myriad of challenges in their educational journey, such as limited access to learning resources, difficulties in understanding visual material and barriers in accessing information delivered through traditional teaching methods. These challenges can hamper their academic progress and social integration within the school environment.

The growth of educational programmes for visually impaired children has a complicated past. It took centuries for attitudes and practices around disability education to become systematic and really beneficial to the communities who most needed them. The stigma associated with disabilities in society has delayed the development of resources and technology. For those with visual impairments specifically, this was the same. Early on, there were very few programmes for the visually impaired, and they were defined by indifference or seclusion. Gradually, though, attitudes towards the visually impaired changed, first towards compassion and empathy, and finally towards self-reliance and social inclusion. (Sylvester, 2020).

The establishment of special schools for the blind, such as the Perkins School for the Blind in the United States (1829) and the Royal National Institute of Blind People in the United Kingdom (1868), marked a turning point in the systematic instruction of visually impaired children. These establishments used to specialise on braille, tactile learning, and manual skills instruction. However, the need of including visually impaired kids into the mainstream education system was becoming more clear by the turn of the 20th century. (Nordstrom, 1986). Early adopters of inclusive education practises and creators of innovative teaching techniques were Helen Keller and Louis Braille. Such schools were being established in the same periods in India too. The Bengal Military Orphan Asylum, Calcutta, having blind orphans in its school, adopted the Lucas reading system by 1840, although this system was overtaken by Moon's embossed type for blind readers in several Indian languages during the 1850s. It appears that these students are the first in South Asian history to attend school in a formal system specialised to their need, with materials mostly supplied by colonial authority. (Miles, 2011).

The Sharp Memorial School for the Blind, named for its founder Annie Sharp, was the first special school for the blind to be established in India and opened its doors in Amritsar in 1887. The American Marathi Mission School for the Blind in Mumbai was established in 1900 and became known as "The Dadar School for the Blind." Other special schools also arose in the following decades in various parts of the nation, including the Calcutta School for the Blind, which was founded by Lal Bihari Shah in 1897. Here, blind students got instruction in addition to learning some basic trades, which eventually helped them get vocational rehabilitation. (Sylvester, 2020).

This gradual evolution led to a modern educational landscape that emphasised personalised learning approaches, inclusive pedagogy and the smooth inclusion of visually impaired students in various educational settings. As the country progressed, a more inclusive approach began to emerge(Ryles, 2000). In 1967, special schools such as the "National Institute for the Visually Handicapped" (NIVH) in Dehradun were established, offering specialised instruction, Braille materials, and vocational training. Since then, the government and other non-profit organisations have worked to increase the number of opportunities for learning for students with visual impairments, including the integration of inclusive learning in mainstream schools. This laid the groundwork for the current programmes for visually impaired students in India. (Kumar et al).

Talking about recent advances in technology, such as screen reading software and digital Braille devices, have played a crucial role in

fostering the learning experience for students with visual impairment. Additionally, legal measures like the Persons with Disabilities (PwD) Act, 1995 and the Rights of Persons with Disabilities(RPwD) Act, 2016 have further improved access to education and created a more inclusive environment for visually impaired individuals.

It is essential that visually impaired students receive an education in order to provide them with the information and skills they need to live independent and satisfying lives. Special programmes must be created to fulfil the unique demands of visually impaired pupils because the standard educational system frequently falls short of meeting their needs. In order to foster an inclusive learning environment, these courses have to incorporate cutting-edge teaching strategies, easily accessible technology, and flexible course materials. In addition, it's critical to comprehend the state of this field's research in order to spot gaps and suggest areas for future development. (Ramos & de Andrade, 2019)

The "World Health Organisation" (WHO) estimates that 2.2 billion people around the world have a vision impairment, of which at least 1 billion have a condition that can be prevented or that is still not receiving adequate treatment (WHO, 2020). More intervention measures that are tailored to the individual requirements of students with visual impairment are required to ensure their success and inclusion. To tackle the unique learning requirements, numerous educational programmes and initiatives have been put in place; nonetheless, it is crucial to thoroughly assess the efficacy of such interventions using sound methodology.

As the world moves towards greater tolerance and diversity, it is imperative that visually impaired students be included in order to create a fair and accessible learning environment. To meet the needs of visually impaired children, various policies have been passed worldwide that place a high priority on inclusive education and urge the inclusion of visually impaired students in regular classroom environments. Analysing the effectiveness of particular educational programmes created to meet the particular needs of visually impaired students is crucial. (Kumar, 2007). Legislative frameworks have been implemented in a number of nations to guarantee visually impaired individuals equitable access to schooling. To promote inclusive education and equitable opportunities for people with disabilities, including those who have visual impairments, the "United Nations Convention on the Rights of Persons with Disabilities" (UNCRPD) offers a comprehensive framework. (Hayes and Bulat, 2017)

The Convention emphasises the need for reasonable accommodation, such as special learning materials, assistive technology and qualified teachers, to facilitate better opportunities for learning to the students with visual impairment. Furthermore, the significance of inclusive and high-quality education for everyone is underscored by Sustainable Development Goal 4 (SDG 4), which guarantees equitable access to educational opportunities for all individuals, including those with disabilities.

Furthermore, the "Individuals with Disabilities Education Act" (IDEA) of the United States requires that students with disabilities, including visual impairments, receive a free and adequate public education. In the same way, the European Union has created the European Disability Strategy 2010-2020, which focuses on the rights of individuals with disabilities, particularly the right to education. These regulations demonstrate the worldwide commitment to creating accessible learning settings for children with vision impairments. (Hoffmann &Dakroury, 2013).

All children in India between the ages of six and fourteen, including those with disabilities, are guaranteed free and compulsory education under the Right of Children to Free and Compulsory Education Act (RTE Act). Additionally, schools must provide accommodations for students with disabilities under the RTE Act, such as braille texts and assistive technology. Moreover, the Rights of Persons with Disabilities Act, 2016 in India upholds the dedication to guaranteeing fair chances and educational access for people with disabilities, encompassing those who suffer from visual impairments. (Narayan & John, 2017). A significant step towards changing the educational system to accommodate the various requirements of all students, including those with visual impairments, is the National Education Policy (NEP) of 2020. In order to establish an inclusive learning environment, it emphasises the integration of assistive technology, accessible learning materials, and specialised training for instructors. The policy also emphasises how critical it is to provide accessible infrastructure and offer thorough support services to visually impaired pupils inside the educational system. These legislative efforts demonstrate a commitment to advancing inclusive education and creating a setting that promotes

visually impaired children' overall development. (Sharma, 2023)

Although a lot of research has been done on inclusive education and special education, not much of it has examined the evaluation of special education programmes for children who are visually impaired.

II.   Study Trends

In inclusive settings, Verdier and Ek (2014) looked at the academic achievement and reading growth of visually impaired students learning and the help they received. Semi-structured interviews and records, including observation reports and individual student grades, were gathered and examined. Six students in inclusive classrooms had severe visual impairment or blindness, together with their parents and teachers. All three components of the result were different. Only two students received adequate support from the school; the majority received insufficient assistance. Overall, there was no discernible difference between visually impaired and sighted readers' reading comprehension. Variations were seen in the speed of decoding and reading. The grades of each student enrolled in general education classes were average.

A systematic approach to teaching English as a second language that prioritised including visually challenged students was put forth by Cárdenas & Inga (2021). The study reviewed scientific papers using a historical, descriptive procedure and divided it into phases utilising analytical and synthetic techniques. Based on skills and abilities, the system divided learning stages into groups, and a route map is created to make managing visually impaired students easier. For effective inclusion in the educational process, a procedural handbook, a road map, and typo-technical instruments were established. The approach was intended for use in classrooms with and without disabilities as well, and in order to offer helpful assistance, teachers must receive training in pedagogy, technology, and discipline. Learning new information can spur investment in higher education institutions.

A study by Alves et al. (2009) examined the use of information technology, namely assistive technology, in the teaching of visually impaired students. In São Paulo, Brazil, three municipalities' worth of teachers participated in the study. The findings demonstrated that specialised computer programmes were essential, and that there were variations in the specifics and usefulness of assistive technology for students who were blind or

low vision. Communication, reading and writing abilities, and general quality of life were all improved by information technology. But the absence of course preparation was the primary deterrent to adopting it. Advisers, adequate computers, and pedagogical support were the primary prerequisites for the use of information technology in the classroom. According to the study, information technology played a critical role in helping visually impaired pupils become more independent and self-sufficient.

Robles et al. (2023)in their study on language learning apps for visually impaired users used"The Preferred Reporting Items for Systematic Reviews and Meta-Analysis" (PRISMA) methodology to review 274 research papers. The study revealed that information communication technologies, assistive technologies, and electronic accessibility features had significantly influenced usability guidelines and modern language learning applications of mobile for visually impaired users. Writing, reading, and spelling had become more difficult, with grammar-based activities replaced by various communication methods. Speaking and listening skills were increasingly emphasized due to their less technically demanding nature. The study provided instructional designers ideas for creating inclusive language learning applications considering technological, pedagogical, and psychological factors, as well as acceptable affordances for both sighted and visually impaired users. Mobile Assisted Language Learning (MALL) aimed to maintain language abilities integration, adopting communicative techniques instead of specific words and structures. To further understand the three essential components of creating accessible language learning applications, more investigation was required.

Pandey (2018) investigated the adjustment of 60 visually impaired students aged 14-16 in special and integrated schools in Varanasi, India. Surveys were conducted to gather information on their home, school, and personal areas in special and integrated settings. The results showed significant differences in the adjustment of visually impaired students in these areas. The study aimed to understand their experiences in these settings.The study found that students in inclusive settings were better adjusted in various areas, including home, school, and personal areas. These settings were found to be more favourable for mainstreaming visually impaired students, as they showed more age-appropriate behaviour. This matched with previous research by Daniel (2012), Pandey (2013), and Parua (2015). The findings also

suggested that authorities should organize workshops, seminars, lectures, and conferences on special education to raise awareness among teachers, students, administrators, school management committee members, parents, educator, social workers, and media personnel working in special, integrated, and inclusive education.

The lived experiences of students with visual impairmentwere the main focus of Oteifa et al., (2023) studied on inclusive school design. They employed a hybrid strategy, using in-depth interviews and phenomenological analysis to extract spatial features from their experiences. As per the study, designers could make inclusive designs that meet the demands of visually impaired students by having a thorough grasp of their needs. When someone has visual limitations, information gathered by other senses—like touch and sound—is given priority. Since students mostly rely on their other senses to comprehend their surroundings, inclusive school design is essential for offering sensory stimulation. To improve orientation and confidence in visually impaired youngsters, it can be helpful to use contrasting colours textures, patterns, sounds, and scents to assist them distinguish between surfaces and objects.Inclusive school design ensures safe and confident movement, using different navigation methods and clear access cues in school layouts. The study concluded that inclusive school design is crucial for creating a welcoming environment that supports learning and well-being, improving academic performance and overall satisfaction.

Teke and Sozbilir (2019)studied to identify the requirements of a blind student in an inclusive chemistry classroom and to design and develop tactile materials to teach "energy in living systems". This was a single case study design. In-depth interviews and classroom observations were conducted. This was a tenth-grade, congenitally blind, and male student in a public school who was literate in braille. The student obtained information through the teacher's verbal description or by reading the textbook on his own. The blind student's needs were not being met, and he did not understand the symbolic representations in chemistry. After he was provided with written materials, 2D embossed drawings, and 3D models, the student was able to develop a better understanding.

Koehler & Wild, (2019) studied to make clear what teaching strategies, equipment for the disabled, accommodations, adjustments, and pedagogy were applied in mainstream science classrooms to educate students with visual impairment. An online survey was carried out. The survey inquired about the methods by which students with visual impairment entered the science classroom, the tools they utilised, the adjustments and accommodations they made, and the assistive technologies they employed. 35 questions were asked. For the visual impairment/Orientation & Mobility experts, there were fifty-one specialist teachers. Participants were selected by convenience sampling, and 47% had more than 15 years of experience teaching in preschool through post-high school settings. The vast majority of visually impaired students received a standards-based education and studied science in general education classes. But most did not receive support from science teachers.More than half of the educators reported that not one of their students enrolled in advanced placement science courses. Preparing tactile images and offering accommodations like verbal descriptions, extended exam times, and materials with large text were the most often requested adjustments. Visually impaired students did not participate too much in the lab.

"PRINT3D, a Service-Learning Project for Improving Visually Impaired Accessibility through Educational 3D Printing" was the subject of Lozano's (2022) study. The project, which was funded by the European Erasmus+ Programme, used 3D design and printing to teach fundamental engineering skills and improve accessibility for people with visual impairments. The project encouraged empathy, comprehension of accessibility requirements, and the creation of accessible items. More technical proficiency, social awareness, and drive were the outcomes, particularly for students who were more likely to drop out. In order to improve students' understanding of real-world technological problem detection, information search, communication, problem-solving, creative thinking, and practical application of ideas, the project made use of developing technologies such as 3D printing.Students learned about CAD, operating machinery, and material qualities through this project as well. Many platforms and material donations to organisations for the blind and visually impaired helped to support the project. Despite little research, the project served as a model for other educational initiatives of a similar nature.

In order to help visually impaired primary school kids with their arithmetic abilities, Marzhan et al. (2022) carried out a study in which 78 students took part in a 4-week classroom training

programme as part of the research. Utilising a tool for measurement, data was gathered, and the findings demonstrated that the training had a favourable effect on the students' motivation and education. The study was carried out in the fall of the 2021–2022 school year. In this experimental study, 78 visually impaired elementary school students participated, and their families were also interviewed. According to theinvestigation that looked at computer usage patterns, visually challenged pupils used voice-activated computers for more than five hours per day. With the assistance of the students' families, the technology was created, and a habit was formed. According to the study, visually impaired students in primary school preferred to use calculator applications for mathematical and technological purposes for up to five hours at a time. They can't wait to use technology during lunch and pick up skills designed for them. The study also discovered a noteworthy disparity in the educational attainment of visually impaired students, with female students scoring higher on average and male students scoring averagely. According to the survey, visually impaired pupils have high expectations for basic computing instruction, technology, and applications. They also think that audio applications are crucial. The development of these students' arithmetic skills is directly correlated with the assistance their families provide for their education, and these students also benefit financially from the usage of technology.

III. Discussion and conclusion

This study will focus on specific school programs for visually impaired students which is imperative for understanding the efficacy and impact of educational interventions that meet their unique needs.In spite of the existence of various educational initiatives, a comprehensive analysis of these programs through a systematic approach is not available in the major sources of literature. Systematic review-based studies and bibliometric analysis is also not available from available works. However, there are certain bibliometric analysis available related to students with visual impairment. In one of the studies named, "Bibliometric mapping of psychological well-being among children with a visual impairment" Kúld et al., (2021), conducted a bibliometric analysis of research on psychological well-being among children with a visual impairment to provide a visual overview of common topics included in psychological well-being research from 2000 to 2018 among children with a visual impairment. It

provides a comprehensive overview of research on children with visual impairments, focusing on behaviour, relationships, attachment, parenting, cerebral visual impairment, cerebral palsy, intellectual disability, and autism spectrum disorder. Future studies need to focus on children with rare disorders, studying relationships between children and their parents and siblings, and adapting assistive technology to the needs of children and other issues that need further research attention include the experiences of children with a visual impairment of romantic relationships, bullying, stigma, and discrimination.

In another research paper, "Impact of ICT on university students with visual impairment", Rueda et al., (2023) aims to provide the academic community with an overview of the research pertaining to ICT as a support for students with low vision or blindness as despite the progress that has been made, university students with disabilities identify barriers in their university careers, such as the lack of teacher training, insufficiently adapted curricula and teaching materials, and inaccessible infrastructures. Access to quality higher education is essential for all students; however, those with disabilities require additional guarantees and tools to enable them to participate in university equally. The study reviews the impact of "Information and Communication Technology" (ICT) on students with visual impairment in higher education. It reveals that ICT allows students to access digital information through software or applications like screen readers, magnifiers, or Braille lines. However, the use of these tools is not sufficient for students to access virtual information. Teachers are essential to giving visually impaired pupils a high-quality education, yet inclusive education is hampered by their lack of digital competency training. Teachers should get initial and continuous training on ICT application for students with visual impairments to avoid digital tools becoming hurdles. There were also a number of drawbacks. While many publications discuss the use of ICT in the education of children with disabilities, there are few that concentrate especially on the effects on students who have visual impairments.

These aforementioned studies dealt with visually impaired students. However, there is no specific studies related to program for visually impaired students from the available literature. A study of this nature is imperative as it provides a systematic and quantitative assessment of the existing research landscape and provides a comprehensive understanding of the trends, patterns and gaps in the field of education for

visually impaired students. More studies are needed to locate the most influential authors, research trends, most cited article and from which country the most articles are published so that it will shed light on the global distribution of knowledge production and possible collaborations.Moreover, such an investigation would facilitate the identification of key research themes, methodologies, and publication trends, enabling educators, policymakers, and stakeholders to make informed decisions about the design and implementation of effective and inclusive school programs for visually impaired students.

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