NIEPID

National Conference on Techno-Pedagogic Approach in Rehabilitation of Children with Special Needs

Rehabilitation 2.0

24 & 25 November, 2023

स्वावलम्बन
Swavlamban

PROCEEDINGS

Organized by

NATIONAL INSTITUTE FOR THE EMPOWERMENT OF PERSONS WITH INTELLECTUAL DISABILITIES (DIVYANGJAN)

(Department of Empowerment of Persons with Disabilities)
Ministry of Social Justice & Empowerment, Govt. of India
Manovikas Nagar P.O., Secunderabad - 500 009, Telangana
An ISO 9001: 2015 Certified Institution

Proceedings of the

National Conference on

Techno-Pedagogic Approach

in Rehabilitation of Children with Special Needs

REHABILITATION 2.0

24th & 25th November, 2023

Editors

B. V. Ram Kumar
Dr. Ambady K. G.
Dr. Sunita Devi

Funded by

Department of Empowerment of Persons with Disabilities, (Divyangjan)
Ministry of Social Justice & Empowerment, Govt. of India
Under National Fund for PWDs

Organized by

NATIONAL INSTITUTE FOR THE EMPOWERMENT OF PERSONS WITH INTELLECTUAL DISABILITIES (DIVYANGJAN),
(Department of Empowerment of Persons with Disabilities, (Divyangjan)
Ministry of Social Justice & Empowerment, Govt. of India)
Manovikas Nagar, Secunderabad – 500 009, TS.
An ISO 9001:2015 Institution

Rehabilitation 2.0: Proceedings

National Conference on Techno-Pedagogic Approach in Rehabilitation of Children with Special Needs

ISBN: 978-81-965926-3-9

Published by NIEPID, Secunderabad – 500009, Telangana

राजेश अग्रवाल, भा.प्र.से.
सचिव
Rajesh Aggarwal, IAS
Secretary

सत्यमेव जयते

आज़ादी का अमृत महोत्सव

भारत सरकार
सामाजिक न्याय और अधिकारिता मंत्रालय
दिव्यांगजन सशक्तिकरण विभाग
Government of India
Ministry of Social Justice & Empowerment
Department of Empowerment of Persons with Disabilities (Divyangjan)

MESSAGE

Technology in education can play a vital role in efforts towards rehabilitation and empowerment of persons with disabilities (PWD). Techno-pedagogy can help students access education independently and make them more independent and improves their quality of life. Keeping this in view, I am happy to note that National Institute for the Empowerment of Persons with Intellectual Disabilities (Divyangjan) (NIEPID) is collaborating with start-ups/NGOs and other institutions working in the field of technology to improve the life of persons with disabilities. In continuation of this effort, NIEPID is organizing a **National Conference on Techno-Pedagogic Approach in Rehabilitation of Children with Special Needs, "Rehabilitation 2.0,"** at **NIEPID, Secunderabad,** on November 24 and 25, 2023.

The conference aims to provide opportunity for rehabilitation professionals and other stakeholders from diverse field to discuss about recent development in the field of technology and education, which will help to enhance the existing knowledge and use technology in pedagogic approach. The national conference will enable rehabilitation professionals and students to understand latest updates and trends in usage of technology in providing quality education for improving quality of life of PWDs.

This platform will also benefit rehabilitation professionals to network and exchange information on the technology innovations among experts across the country, and plant the seeds of innovative thoughts and efforts.

I wish all the participants of "**Rehabilitation 2.0**" a learning and enjoyable scientific gathering at **NIEPID, Secunderabad,** on November 24 and 25, 2023.

(Rajesh Aggarwal)
21st November, 2023

5वां तल, पं. दीनदयाल अंत्योदय भवन, सी.जी.ओ. कॉम्पलेक्स, लोदी रोड़, नई दिल्ली–110 003
5th Floor, Pt. Deendayal Antyodaya Bhavan, CGO Complex, Lodhi Road, New Delhi-110 003
Tel. : 011-24369067, 24369055 E-mail : secretaryda-msje@nic.in
www.depwd.gov.in @socialpwds

Accessible India Campaign

FOREWORD

At the heart of any science lies an unquenchable thirst for the new ways to make our life better. Advancement in technology is the one area which has shown hope to improve the quality of life of people with disabilities. Education is the most effective vehicle of social and economic empowerment. Technology can really make an impact in education, especially in reaching out to the persons who do not have access to center based models.

It is essential now that rehabilitation professionals start working on developing educational-technological innovations keeping a special focus on technologies which can enhance learning and address the learning needs of persons with disabilities like assistive technology, remedial teaching technology, etc. **National Conference on Techno-Pedagogic Approach in Rehabilitation of Children with Special Needs, "Rehabilitation 2.0,"** at NIEPID, Secunderabad aims to provide exposure, build and expand networks, facilitate connections with other rehabilitation professionals and potential partners. It will also open avenues for a possible collaboration between the start-ups/ innovators as well as other relevant stakeholders.

I expect that this national conference can spark the interest in new innovations and technology for making the PWDs more independent.

Shri. B. V. Ram Kumar
Director (Offg.), NIEPID

Contents

About the Institute

The National Institute for the Empowerment of Persons with Intellectual Disabilities NIEPID, (Divyangjan), formerly known as National Institute for the Mentally Handicapped, is a registered society established in the year 1984 as an autonomous body under the Department of Empowerment of Persons with Disabilities (Divyangjan), Ministry of Social Justice and Empowerment, Government of India. The institute is an apex body having tripartite functions of training, research and services in the field of Intellectual Disability in the country.

For the last 39 years, the Institute has been making significant advances in building capacities to empower persons with Intellectual Disability. Based on the latest developments and recent trends in the field, the Institute strives to organize new programmes and make innovations through research and development. National and International collaborations entered into by the Institute in its various activities reflect the global characteristics of the organization. The activities of NIEPID are planned following the mandates of the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), the Legislative Acts, and the National Policy promulgated for the Persons with Disabilities. NIEPID strives to be an Institute of excellence focusing on high standards in every aspect of its functioning to bring equality and dignity in the lives of persons with Intellectual Disability (PwID), which is endorsed by ISO 9001:2015 certification.

NIEPID has made noticeable progress in Human Resource Development, Research and Development and Direct Therapeutic Services to improve the quality of life of persons with Intellectual Disability.

Objectives

NIEPID, at its inception itself, projected multifarious activities to enhance the quality of life of persons with Intellectual Disability. Accordingly, the aims and objectives of the society have been spelt out as follows:

- To conduct, sponsor, coordinate or subsidize research into all aspects of the education and rehabilitation of Persons with Intellectual Disability.
- To undertake, sponsor, coordinate or subsidize research into bio-medical engineering leading to the practical evaluation of aids/suitable surgical or medical procedure or the development of new aids.
- To undertake or sponsor the training of trainees and teachers, employment of officers, psychologists, vocational counsellors, and other personnel as may be deemed necessary by the Institute for promoting the education, training, or rehabilitation of Persons with Intellectual Disability.
- To distribute or promote or subsidize the manufacture of proto-types and distribution of any or all aids designed to promote any aspects of the education, rehabilitation or therapy of Persons with Intellectual Disability.

From the above aims and objectives, the following functional objectives evolved:

NIEPID Objectives

- To create manpower and develop Human Resources for delivery of services to Persons with Intellectual Disability.
- To identify, conduct and coordinate research in the area of Intellectual Disability in the country.
- To develop appropriate models of care and habilitation for Persons with Intellectual disabilities suitable toIndian culture.
- To provide consultancy services to voluntary organizations in the area of Intellectual Disability.
- To serve as a documentation and information centre in the area of Intellectual Disability.
- To develop community-based rehabilitation services for the rural and low income disadvantaged population.
- To undertake extension and outreach programmes in the field of Intellectual Disability.

NIEPID has its headquarters at Secunderabad, Telangana. It has s even departments, namely Rehabilitation Psychology, Special Education, Medical Sciences, Therapeutics, Adult Independent Living, Community Rehabilitation & Project Management and Library & Information Sciences.

There are three Regional Centres, each located at New Delhi /Noida, Kolkata and Navi Mumbai. NIEPID has a Model Special Education Centre in New Delhi and Noida. Composite Regional Centre at Nellore was set up in January 2016, and it was shifted to its permanent building in February 2019. NIEPID set up CRC at Davanagere in Karnataka State in March 2017 and currently running in temporary premises provided by the State Government of Karnataka. Construction of the permanent building is in progress. The administrative control of CRC at Rajnandgaon in Chhattisgarh State was transferred to NIEPID in May 2020.

Persons with Intellectual Disabilities (PWID) generally need a plethora of services to make them functionally as independent as possible and improve their quality of life. NIEPID provides a spectrum of service delivery systems for the rehabilitation of persons with Intellectual Disabilities. It is common practice to use a multi-disciplinary approach to provide comprehensive services relevant to the individual needs of PWID.

NIEPID has evolved its extension of services based on life cycle approach encompassing infants, children, youth and adults as indicated below:

- Early identification, Early Intervention and Prevention of Disabilities
- Minimization of the adverse effect of developmental delays and acceleration of the rate of development of children
- Preschool Education
- Special Education Programmes
- Vocational Training and Job placement
- Independent living skills

The services are also focused on persons with severe and profound Intellectual Disability in the unit named 'Manoranjanam' and a Multi-Sensory Unit that offers intense sensory stimulations for children with profound andmultiple disabilities.

Human Resource Development aims to achieve the most crucial objective of competency development and capacity building at all levels. As one of its prime objectives, NIEPID is engaged in a continuous process of competency development in people and creating trained human resources through its HRD programmes to enhance the growth of individuals with disabilities. The policies and programmes of the institute are designed to support and sustain opportunities for continuing acquisition of knowledge, skills, attitudes and competencies which are beneficial to the individual and the society. In human resource development, the primary activities are to conduct long- term and short-term courses, training, workshops and continuing education programmes for professional enculturation. NIEPID organizes national level programmes for professionals, parents and persons with Intellectual Disability on important, relevant themes to build awareness and penetrativethinking in intellectual disability.

In order to promote human resource development, NIEPID is conducting 10 long-term training programmes (4 Diploma courses, 2 Graduate, 3 Post Graduate courses, which include 1 M.Phil programme and CBID course (6 months)) approved by the Rehabilitation Council of India at the Institute's headquarters and its regional centers. These courses are identified and developed as per the need felt in this area. NIEPID conducted 10 long-term training programmes in the year 2022-23. A total of 507 candidates against the strength of 767 were enrolled for the year 2022-23 in different coursesat NIEPID HQs, and its regional centers along with CRCs

Research and Development is one of the crucial objectives of NIEPID. An analysis of the R & D Projects completed at NIEPID during the last 39 years reveals that the central focus of the R & D has been in applied research. Considering the research requirement in the field, proposals are presented and approved by designated committees such as the Academic Committee and Ethics Committee of the Institute before initiating the project. The proposals are initially discussed at the Departmental level and regular faculty meet level before submitting them to the Academic Committee. Further, all the R&D projects are submitted for the approval of the Ethics Committee of NIEPID. So far, 75 research projects have been completed in collaboration with various national and international agencies such as US- India Rupee Fund, UNICEF, UNDP, ICSSR and S&T Mission Mode, and the Projects funded by the Institute.

The Institute conducts International and National level Conference / Seminars / Workshops on Persons with Intellectual Disabilities (Divyangjan) in partnership with leading voluntary organizations, parent associations. Special employees National meet at NIEPID, National meet of parent organizations and National level Workshops.

The institute focuses on quality in every aspect of its functioning to bring equality and dignity in the lives of Persons with Intellectual Disabilities (Divyangjan), which is endorsed by ISO 9001: 2015 certification.

About the Conference

The conference aims to explore the integration of technology and pedagogy in the rehabilitation of children with special needs. The increasing prevalence of special needs in children and the advancements in technology have created new opportunities to enhance rehabilitation processes. This conference will bring together educators, researchers, therapists, technology developers, and policymakers to share insights, research findings, and best practices in using techno-pedagogic approaches to support the holistic development of children with special needs.

The conference will explore the use of technology to improve the assessment, diagnosis, intervention, and education of children with special needs. The use of technology in the rehabilitation of children with special needs has grown exponentially in recent years. This is due to a number of factors, including the increasing availability of affordable and accessible technology, the growing body of research on the effectiveness of technology-based interventions, and the increasing demand from parents and educators for effective and innovative ways to help children with special needs reach their full potential. It will emphasize the challenges faced by educators, therapists, and caregivers in ensuring inclusive education and rehabilitation opportunities. The section will also highlight the potential benefits of adopting a techno-pedagogic approach in addressing these challenges.

The conference will explore a wide range of topics related to the techno-pedagogical approach to rehabilitation of children with special needs. These topics will include:

- The use of technology for assessment and diagnosis
- The use of technology for intervention
- The use of technology for education
- The ethical and legal considerations of using technology with children with special needs

The conference's objectives are:

- To understand the impact of technology on the rehabilitation of children with special needs.
- To explore innovative pedagogical methods that can be integrated with technology to support inclusive education.
- To discuss successful case studies and best practices of techno-pedagogic interventions in different settings.
- To identify barriers and challenges in implementing techno-pedagogic approaches and ways to overcome them.
- To foster collaborations among educators, therapists, and technology developers for more effective rehabilitation strategies.

Keynote Address - 1

Techno-Pedagogic Approach in Enhancing Learning of Children with Special Needs

Dr. Hrushikesh Senapaty

Former Director, NCERT & Professor of Education RIE Bhubaneswar
hksenapaty@hotmail.com

The global education development agenda reflected in the Goal 4 (SDG4) of the 2030 Agenda for Sustainable Development, adopted by India in 2015 - seeks to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" by 2030. The National Education Policy 2020 envisions an education system rooted in Indian ethos that will transform India into an equitable and vibrant knowledge society. This can be achieved by providing high quality education to all categories of children including the children with special needs or Divyang children. That is why the NEP 2020 recognizes the importance of creating enabling mechanisms for providing children with special needs (CWSN) or *Divyang*, the same opportunities of obtaining quality education as any other child.

It implies that the children with disabilities will be enabled to fully participate in the regular schooling process from the Foundational Stage to higher education. The Rights of Persons with Disabilities (RPWD) Act 2016 defines inclusive education as a 'system of education wherein students with and without disabilities learn together and the system of teaching and learning is suitably adapted to meet the learning needs of different types of students with disabilities'. This Policy is in complete consonance with the provisions of the RPWD Act 2016 and endorses all its recommendations with regard to school education.

Since students with and without disabilities will learn together, there is an urgent need of understanding the learning needs of all categories of learners. Children with learning disabilities are generally behind their age as compared to other children in acquiring new skills required for daily activities and academic learning. Children with learning disabilities can learn and develop new skills, but compared to other children of the same age, they need more time and practice. It has been shown that assistive technology tools are efficient ways to assist and teach children with different types of learning difficulties. As we know, technology is a learning tool, a thorough understanding of pedagogy is essential to take full advantage of technology. That is why, there is an urgent need of taking advantage of the techno pedagogic approach in teaching learning process to cater to the needs of all categories of children.

Adoption of technology, particularly, ICT in the teaching learning process generally proceeds in four broad stages. These four stages, i.e. Emerging, Applying, Infusing and Transforming, give rise to the mapping that have been broadly classified as supporting work performance, enhancing traditional teaching, facilitating learning and creating innovative learning environments. More than four decades ago, computers and related information technology were introduced to educators for direct teaching and learning purposes. ICT started its journey primarily with productivity tools, proceeded to

self-learning courseware and multi-modal instruction, and finally progressed to web-based learning management system. Now Generative Artificial Intelligence (GAI) is going to influence the teaching learning process in a very big way.

It is observed that when there is a change in pedagogical approach, there is corresponding change in the use of technology. In product oriented approach, particularly, in behavioristic approach learners learn from technology, where everything is prefixed and prescribed. It is called 'full technology'. Where as in process oriented approach, particularly, in constructivist approach, learners learn with technology, where there is no prescription and nothing is prefixed, learners use technology as a learning tool with lot of flexibility. It is called 'empty technology'. For effective teaching with technology there are three core components: content, pedagogy, and technology, along with the relationships among and between them. The interactions among the three components, account for the wide variations seen in the extent and quality of pedagogy technology integration. Such goals are not ease to achieve. To accomplish this goal requires both a change in the traditional views of the learning process and an understanding of how the digital technology can create new learning environments in which students are engaged learners, able to take greater responsibility for their own learning and construct their own knowledge.

As per the recommendation of NEP 2020,schools/school complexes will be provided resources for the integration of children with disabilities, recruitment of special educators with cross-disability training, and for the establishment of resource centres, wherever needed, especially for children with severe or multiple disabilities. Barrier free access for all children with disabilities will be enabled as per the RPWD Act. Different categories of children with disabilities have differing needs. Schools and school complexes will work and be supported for providing all children with disabilities accommodations and support mechanisms tailored to suit their needs and to ensure their full participation and inclusion in the classroom. In particular, assistive devices and appropriate technology-based tools, as well as adequate and language-appropriate teaching-learning materials (e.g., textbooks in accessible formats such as large print and Braille) will be made available to help children with disabilities integrate more easily into classrooms and engage with teachers and their peers. This will apply to all school activities including arts, sports, and vocational education.

As per the RPWD Act 2016, children with benchmark disabilities shall have the choice of regular or special schooling. Resource centres in conjunction with special educators will support the rehabilitation and educational needs of learners with severe or multiple disabilities and will assist parents/guardians in achieving high-quality home schooling and skilling for such students as needed. Home-based education will continue to be a choice available for children with severe and profound disabilities who are unable to go to schools. The children under home-based education must be treated as equal to any other child in the general system. There shall be an audit of home-based education for its efficiency and effectiveness using the principle of equity and equality of opportunity. Guidelines and standards for home-based schooling shall be developed based on this audit in line with the RPWD Act 2016. While it is clear that the education of

all children with disabilities is the responsibility of the State, technology-based solutions will be used for the orientation of parents/caregivers along with wide-scale dissemination of learning materials to enable parents/caregivers to actively support their children's learning needs will be accorded priority (NEP 2020).

Most classrooms have children with specific learning disabilities who need continuous support. Teachers must be helped to identify such learning disabilities early and plan specifically for their mitigation. Specific actions will include the use of appropriate technology allowing and enabling children to work at their own pace, with flexible curricula to leverage each child's strengths, and creating an ecosystem for appropriate assessment and certification. Assessment and certification agencies, including the new National Assessment Centre, PARAKH, will formulate guidelines and recommend appropriate tools for conducting such assessment, from the foundational stage to higher education (including for entrance exams), in order to ensure equitable access and opportunities for all students with learning disabilities (NEP 2020).

The awareness and knowledge of how to teach children with specific disabilities (including learning disabilities) will be an integral part of all teacher education programmes. Hence, this techno-pedagogic approach is going to play a very significant role in enhancing the learning level of all categories of learners including the children with special needs.

Keynote Address - 2

Beyond Boundaries: Augmented Realities and Gamified Learning in Diverse Educational Landscapes

Dr. K. Thiyagu
Department of Education, Central University of Kerala, Kasaragod

ABSTRACT

The intersection of augmented reality (AR) and Gamified education presents a promising frontier for revolutionizing learning and therapy. This paper/presentation synthesizes insights from Bower (2014), Guntur (2020), and Herron (2016) to underscore the transformative potential of AR in education and therapy. By providing real-time, context-specific information and enhancing spatial abilities, problem-solving, and motivation, AR emerges as a dynamic tool for fostering higher-order thinking skills and reducing cognitive overload.

The focus shifts to student empowerment as we explore the notion that students can design AR experiences to cultivate higher-order thinking capabilities. The synergy of real objects and virtual information in AR technology facilitates increased interaction with physical environments, offering a pathway to achieving the goals of inclusive education. Moreover, the integration of AR technology holds promise in enhancing learning motivation and frustration tolerance for children with special needs.

Shifting gears, the paper/presentation delves into Gamified education, highlighting its efficacy in enhancing student engagement and learning achievement. Drawing on research by Nah (2013), Subhash (2018), and Mozgaleva (2018), the potential of gamification in higher education becomes apparent. The proposed methodology for gamifying academic disciplines, leveraging elements such as points, levels, badges, leader boards, prizes, progress bars, storyline, and feedback, is a stride toward improving motivation, performance, and engagement.

The narrative concludes by emphasizing the overarching theme: the dynamic fusion of AR and Gamified education as a potent catalyst for unlocking untapped potential in diverse learning environments. The presentation calls for continued exploration, research, and implementation, recognizing these technologies' pivotal role in shaping the future of education and therapy. The journey toward transformative learning experiences begins with the deliberate integration of AR and gamification, promising a paradigm shift in educational practices.

Keynote Address - 3

Current Trends in Digital-based Mental Health Research and Practices

Dr. Priyanka Srivastava, Dr. Vinoo Alluri & Dr. Bhaktoo Dongaonkar
International Institute of Information Technology, Hyderabad

ABSTRACT

In the forefront of mental health research is digital phenotyping, which is the ongoing collection of behavioural and cognitive data via smart phones and wearable technology. These devices gather data in real time on things like social interactions, physical activity, and sleep patterns. This abundance of data is being used by researchers to find digital biomarkers, which will provide more detailed understanding of people's mental health conditions.

One trend that has defined mental health practices globally is the growth of telehealth services. Virtual therapy platforms have emerged as viable substitutes for traditional in-person treatment, providing text-based counseling, video conferencing, and virtual support groups. The advantages of telehealth in improving access to mental health care, particularly in rural or underdeveloped areas, are discussed in this section.

Artificial intelligence (AI) is playing a pivotal role in mental health research by analyzing vast datasets to identify patterns and predict mental health outcomes. In order to enable more prompt interventions, machine learning algorithms are being used to aid in the early detection of mental health illnesses. This section explores how AI is being used to predict treatment outcomes and increase diagnostic accuracy.

Gamification, the integration of game elements into non-game contexts, is being employed to enhance engagement in mental health interventions. This movement acknowledges the ability of games to motivate players to modify their behaviour and improve their skills. This section looks at how Gamified methods are used to encourage user engagement and adherence in mental health research and interventions.

The impact of social media on mental health has become a significant area of study. Researchers are investigating the complex relationship between social media use and mental well-being, considering factors such as online social support, cyber bullying, and the effects of curates' online identities. This section delves into the current findings and ongoing research on the role of social media in shaping mental health outcomes.

The current trends in digital-based mental health research and practices signify a paradigm shift in how we understand, diagnose, and address mental health concerns. The use of wearable technology for ongoing monitoring and artificial intelligence (AI) for tailored interventions are just two examples of how the digital world is changing the mental health industry. As these trends develop further, it will be necessary to maintain a balance between innovation and ethical issues in order to guarantee that digital mental health treatments improve people's lives all across the world.

Paper Presentations

Assistive Technology in Inclusive Classroom

Aashima Rawat & Prof. (Dr.) Jayanti Pujari***
* Student, Integrated B.Ed-M.Ed Special Education (Intellectual Disability)
** Director and Professor Amity Institute of Rehabilitation Sciences, Amity University Uttar Pradesh aashima.rawat@s.amity.edu jpujari@amity.edu

ABSTRACT

Assistive technology (AT) is an essential component as it offers creative tools and techniques that enable students with disabilities to actively engage in the educational process. The aim of the study is to probe the implementation of Assistive Technology to enhance learning experiences by special educators in various inclusive schools. Data have been collected with the help of a semi structured questionnaire with three main areas such as knowledge, use and challenges of using Assistive Technology in classroom. The participants are 50 Special educators working in Inclusive schools across Delhi NCR. The findings of the study offer insightful information about how assistive technology is included into inclusive classrooms. Majority of the participants were aware of Assistive Technology and using them during the teaching learning process for children with diverse needs. The study also revealed some challenges involved in implementing AT in inclusive classrooms such as lack of resources, unavailability of Assistive Devices etc. Furthermore, the study emphasizes on how crucial professional development and training are for teachers, in order to make sure assistive technology is used successfully to meet the varied needs of children with disabilities.

Key words: Assistive Technology, Children with Disabilities, Inclusive Education

Introduction

The principles of inclusion, equity, and diversity create the foundation for everyone to have access to education, for a greater number of people to enter the workforce, and for all students to have opportunities for lifelong learning. "Education is the single biggest instrument for promoting social justice and equality," according to the National Education Policy (NEP 2020). This has ramifications for the growth of inclusive communities and society at large. Educational impediments, facilities, and amenities for Children with special needs (CwSN) have to be addressed if policy is to be implemented.

With a special chapter on inclusive and equitable education that focuses on issues, challenges, and suggestions for bridging the gaps and decreasing the inequalities in the participation and access of all learners, the NEP incorporates the components of inclusion for students with disabilities throughout the policy document. The policy covers the concerns and suggestions regarding the inclusion of marginalized student groups, including children with disabilities, under the Socio-Economically Disadvantaged Groups (SEDGs) umbrella term, which encompasses identities of gender, social and cultural as well as socio-economic identities, regional identities, and disabilities. The Policy promotes the Rights of Persons with Disabilities (RPwD) Act, 2016's provisions for CwSN.

The Ministry of Education's integrated Samagra Shiksha scheme, which is centrally sponsored, offers pre-primary through senior secondary schooling. The initiative promotes all states and territories in putting the NEP's recommendations in action and aims to provide universal access to educational opportunities. One of the scheme's main goals is to ensure equal access and participation throughout all levels of schooling. For kids with special needs, inclusive education is one of the interventions. This component covers a range of activities, including block-level assessment camps for disabilities identification, assistance with orientation and awareness programmes, therapeutic services, sporting events, and capacity-building programmes for special

educators, among other things. Multiple options are made accessible to meet the educational needs of CwSN under this component (Ministry of Education).

Therefore, the best approach to ensure that every child has an equal opportunity to attend school, study, & acquire the skills necessary for success is through inclusive education. All students should attend the same schools and classrooms to practice inclusive education. It entails actual educational possibilities for historically marginalized groups, including minority language speakers and children with disabilities.

There is an enhancement in the process of Inclusion when there is a use of Assistive Technology in the Teaching-Learning environment. Any device, piece of machinery, applications, or product system used to grow, maintain, or improve a person with a disability's functional capabilities is known as Assistive Technology (AT). People who struggle with talking, typing and writing, recalling information, signaling, hearing, seeing, learning, walking, as well as many other tasks can benefit from assistive technology. Various assistive technologies are needed for different types of disabilities (Assistive Technology Industry Association).

The decision of assigning an assistive device is typically made by working with a group of experts and consultants who have been trained to match specific needs with particular assistive technologies. Family medical professionals, educators in both general and special education, speech and language pathologists, the rehabilitation specialists, occupational therapists, and other professionals, including consulting officials from assistive technology manufacturers, may all be included on an AT team.

The performance of a child can be enhanced with the inclusion of Assistive Devices in the classroom. The teacher can do so by opting for an appropriate Assistive Technology Solution i.e., choosing AT based on the individual needs in the classroom. For instance, opting for the AT that will reach the wide range of learners (Universal design Learning), recording notes for students (written or audio), providing visual representation of information (picture with words, picture schedule, models), making sure students are seated as per their needs and requirements (CwHI, CwHI, children with ADHD).

Thomas, in their paper mentioned that providing suitable and pertinent training to children with hearing impairments (CwHI) is crucial. In inclusive schools, AT actively participates in CwHI education. He also discusses the benefits and reasons why AT is utilized for CwHI that are self-motivated. Students with CwHI are those who have lost their hearing as a result of infections or accidents. Classroom conditions that are inclusive can benefit many CwHI who have ongoing relationships with AT and support. Any tool used to enhance, elevate, or expand CwHI's communication capabilities is considered an AT (Thomas, 2022).

Ikwuka, Innocent et al. in their paper stated that for inclusive education classrooms in Nigeria to be efficiently operated, rebuilt, and revamped, assistive technology is a vital resource. The aforementioned research paper highlights several assistive technologies that improve and expand inclusive education. For example, students who struggle with writing, can use pen/pencil grippers, models, students struggling with reading, can use electronic books, single-word scanners, talking digital software, students who are hearing impaired, they can use aids for hearing systems, signaling devices and for visually impaired students, there is Braille. The authors argued that integrating assistive technology into the classroom will significantly improve the administration of inclusive education (Iwaki, Innocent Et al., 2019).

Most of the investigators that explored school-age children believed that assistive technology would be beneficial for kids with disabilities. They do concur, though, that educators are ill-equipped to use the latest technology in the educational setting. As more and more children with disability are being included in mainstream schools, there has been a rise in the need for assistive technology applications to meet their unique demands in inclusive environments (Zilz & Pang, 2019).

Provision of suitable assistive technology that satisfies the needs of every user with special needs is imperative for the establishment of a truly inclusive classroom. Having access to and using assistive technology can help close the differences in academic achievement and be a valuable tool for promoting the inclusion of students with special needs in the classroom (Aderibigbe et al., 2017).

Purpose of Study

The main purpose of the present study is to find out the awareness about Assistive Technology (AT) and its use in Inclusive Schools. The present study also identifies the utilization of Assistive Technology for Promoting Inclusion in Schools and challenges faced by the Special Education Teachers in using Assistive Technology as a teaching learning material in an Inclusive set-up.

Methodology

A descriptive Survey Method was used to generate the data related to the use of Assistive technology from the identified participants. The population of the present study is the special education teachers working in the government and private schools of Delhi NCR. Non- Probability purposive sampling method is used to select the sample. The inclusion criteria of the participants are Trained Teacher, Working in any inclusive schools and age ranges between 25 to 50 years with minimum working experiences of 2 years. The sample size (N)is 50 special educators from 20 Inclusive Schools. The minimum age of the participants is 25 and maximum age is 38 and the experiences of the participant's ranges between 2.5 years to 13 years.

Data was generated with a face validated questionnaire having 3 sections; the Knowledge of AT, followed by Uses of AT and challenges faced by the Special Educators while using AT. The participants are required to score the items in terms of yes, no and not sure. The data is generated along with an informed consent.

Data Analysis and Interpretation

The present study aims at probing into the implementation of Assistive technology in Inclusive classroom to enhance learning and promote inclusion. The study employs three main research questions such as (1) what are the level of awareness about AT among the special educators (2) what are the uses of AT in the inclusive classroom and (3) what are the challenges encountered in using AT.

Table 1 Level of awareness among special educators about Assistive technology in Inclusive Classroom

Components	Aware	Not aware	Not Sure
Awareness of the term Assistive Technology	100%	-	-
Support of AT to enhance learning	96.2%	3.8%	-
Provision made by school to promote AT	73.1%	3.8%	23.1%
Participation in workshop/seminar/CRE on AT for Students with disabilities	53.8%	38.5%	7.7%
Professional development opportunities or training sessions attended for effective use of AT	61.5%	38.5%	-

The above table shows the percentages of level of awareness of the participants. The responses depicts that all the special educators are aware about the term AT and 96% of the participants agrees that AT supports children with disability for enhancing their learning. Regarding enhancing knowledge, the survey results depict that 54% of the sample are keen on attending workshops and seminar to enhance knowledge and little more than average sample (61%) have responded saying that they get professional skill development opportunities to enhance their knowledge and skills. Majority of sample (73%) agree that there are provisions in the schools to promote the use of AT for children with disabilities in their schools.

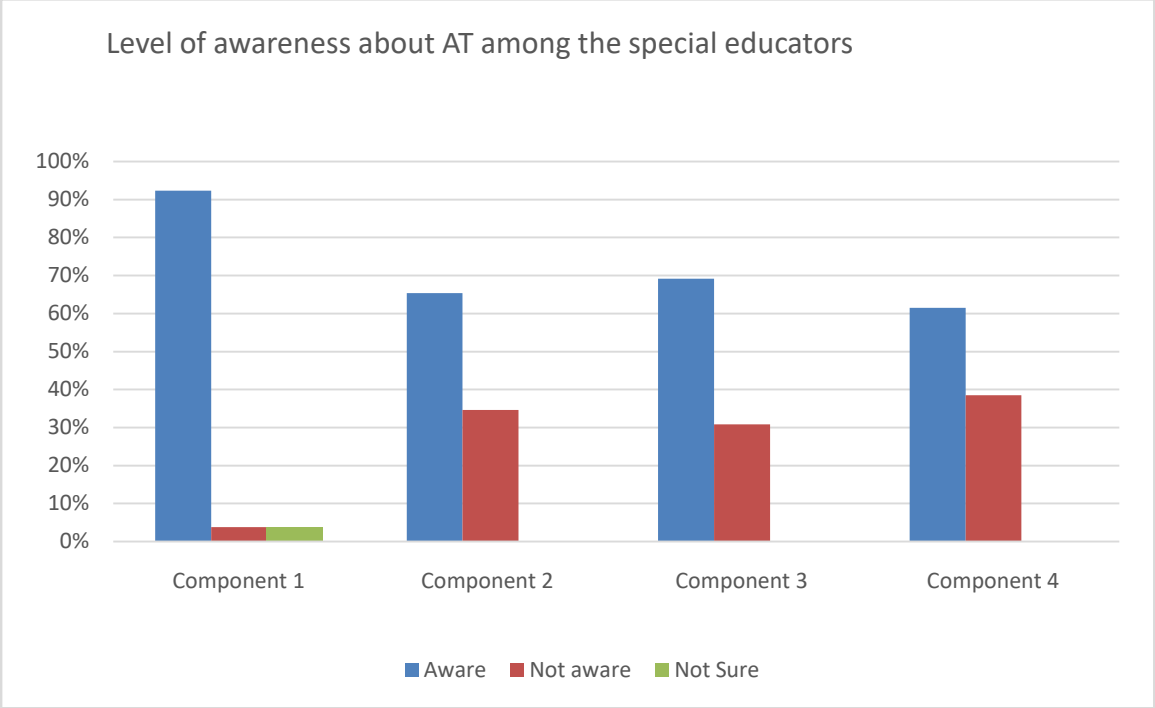


Fig. 1 Level of awareness among special education teachers

Component 1 Awareness of the term Assistive Technology
Component 2 Support of AT to enhance learning
Component 3 Provision made by school to promote AT
Component 4 Participation in workshop/seminar/CRE on AT for Students with disabilities

Table 2 Uses of AT in the inclusive classroom

Components	Aware	Not aware	Not sure
Use of AT in Classroom	92.3%	3.8%	3.8%
Use of Low-Tech Assistive Devices in your classroom	65.4%	34.6%	-
Use of Mid-Tech Assistive Devices in your classroom	69.2	30.8%	-
Use of High-Tech Assistive Devices in your classroom	61.5%	38.5%	-

The above table shows the percentages of Uses of AT in the inclusive classroom by the participants. Majority of participants (69.2%) are using the Mid-Tech assistive devices in their classroom. 64% of the participants use Low-Tech Assistive Devices it is because these devices are readily available in their surroundings. High -tech is the lowest (61.5%)used device stated by the special educator. It might be because high cost and extensive training is required.

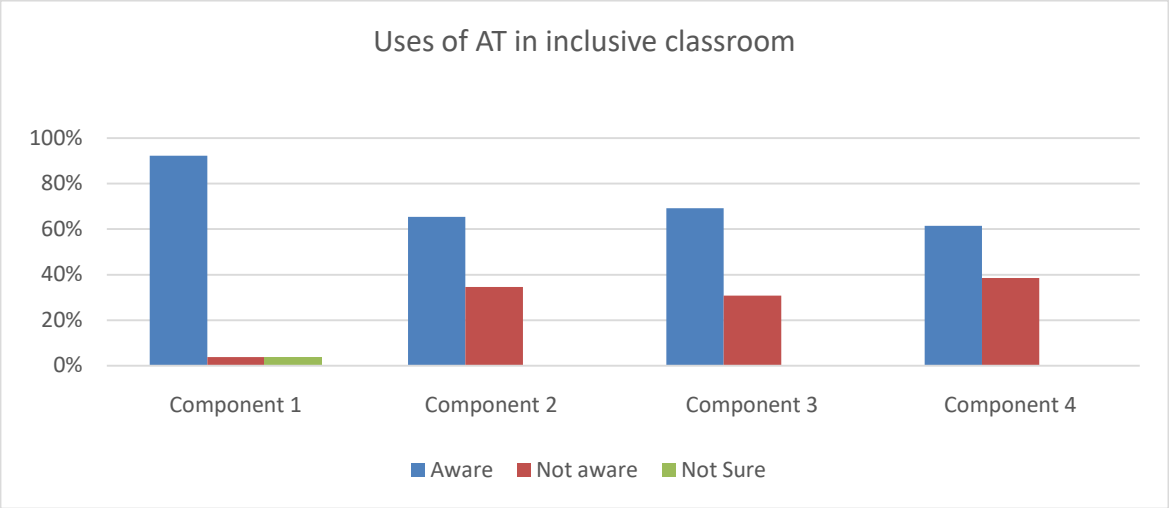


Fig 2 Uses of Assistive Technology in Inclusive Classroom

Component 1 Use of AT in Classroom
Component 2 Use of Low-Tech Assistive Devices in your classroom
Component 3 Use of Mid-Tech Assistive Devices in your classroom
Component 4 Use of High-Tech Assistive Devices in your classroom

Table 3 Challenges of using Assistive Technology

Components	Percentage
Expensive	16.00 %
Not readily available	56.00 %
Lack of resources	28.00 %
Lack of proper training	48.00 %
Proper maintenance	4.00%

The table depicts some of the key challenges faced by the participants with Assistive Technology. 56% participants believe assistive devices are not readily available in the schools; it might be because the schools lack the essential technological infrastructure in order to support the use of assistive devices. 48% has believes because of lack of training they aren't able to use AT. Special educators somewhere lack the proper training to be able to use AT (48%) followed by lack of resources (28%), Expensive (4%) & Proper maintenance (4%).

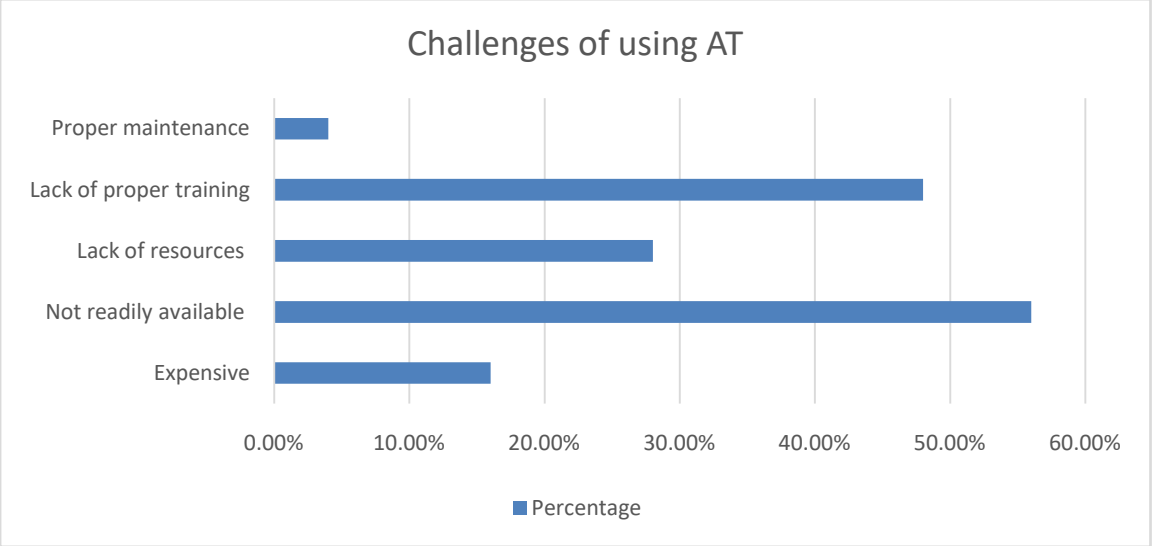


Fig. 3 Challenges of using Assistive Technology

Discussion and Conclusion

According to the present research, assistive technology is essential for improving students with disabilities' involvement in the classroom and their access to instructional materials. This result lines up with other studies, which show that assistive technology tools—like screen readers, communication aids, and adaptive software—can reduce barriers to learning.

Post data collection and analysis our findings provide credibility to the idea that assistive technology can significantly improve classroom efficacy and inclusion. It is observed that majority of participants (96.2%) believes that use of Assistive Technology enhances the performance of the learners. With this study we are able to find out that the schools are also promoting the use of AT in their classrooms (73.1%). Most of the participants (92.3%) are using the AT in their classrooms. It is also observed that, the special educators have experienced various challenges while using AT, such as lack of training, lack of resources, unavailability for devices moderately high cost of the devices. With the provision of necessary resources, inclusive classrooms can promote a fair and inclusive learning environment for children with disabilities. Even though AT has a lot of potential for use in inclusive classrooms, it is critical to recognize the value of teacher training. The present study has potential limitations. The data collected for the study has fewer participants (50). More responses could have been collected. Due to the time constraint the responses gathered are less in numbers. More research papers could have been reviewed by the researcher.

Through this study we conclude that the fundamental tenets of inclusive education can be realized with the use of assistive technology, which encourages personalized learning and equal access to educational resources. In order to do the optimum utilization of AT in inclusive classrooms, instructors and students must be adequately trained and supported. Furthermore, ongoing professional development is necessary to stay updated with technological advancements and adjust to the changing demands of students.

References

Assistive Technology Industry Association. https://www.atia.org/home/at-resources .

Aderibigbe, S et al. (2017). The Relevance of Assistive Technology in Facilitating Learning for Special Needs Students in an Inclusive Classroom.

Ikwuka, O. et al. (2019). Assistive Technology for Effective Management of Inclusive Classrooms.

Ministry of Education https://dsel.education.gov.in/inclusive-education

National Educational Policy 2020, https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf

Thomas, B. (2022). The Effective Practice of Assistive Technology to Boom Total Communication among Children with Hearing Impairment in Inclusive Classroom Settings. *In book: Intelligent Systems for Rehabilitation Engineering*.10.1002/9781119785651.ch10

Zilz, W. & Pang, Y. (2019). Application of assistive technology in inclusive classrooms. *Disability and rehabilitation. Assistive technology*, 16(3):1-3. 10.1080/17483107.2019.1695963,

Perspective of Primary School Teachers toward Inclusion for Students with Specific Learning Disability

Bhumika & Sana Parveen

* Student, Integrated B.Ed-M.Ed Special Education *(Specific Learning Disability)*

** Assistant Professor Amity Institute of Rehabilitation Sciences, Amity University, Uttar Pradesh **bhumika2@s.amity.edu** **sparveen@amity.edu**

ABSTRACT

This research study delves into the perspectives of primary school teachers regarding the concept of inclusion for students with specific learning disabilities. Inclusive Education is a critical approach aimed at accommodating students with diverse needs within mainstream classrooms. The study employs a mixed-methods research design, incorporating surveys and interviews, to gain comprehensive insights into the attitudes, experiences, and challenges faced by primary school teachers in the process of inclusive education. It investigates the impact of teacher training, resources, and support systems on the teachers' ability to provide an inclusive environment for students with specific learning disability.

Keywords: Inclusive Education, Primary School Teachers, Specific Learning Disability

Introduction

According to the Rights of Persons with Disabilities (RPWD) Act of 2016, "Inclusive Education" refers to a system of education in which students with and without disabilities learns alongside one another and in which the teaching and learning process is appropriately modified to accommodate the needs of various student types with disabilities. All children are included in this educational system, regardless of their language, social, emotional, intellectual, physical, or other limitations.

The inclusive education ideology aims to accommodate every student's requirement in the classroom. Its goal is to offer both regular and special needs students a top-notch education all under one roof. In an inclusive education system, all students from a community—including those with specific learning challenges or other conditions—attend the same neighbourhood school. One strategy for encouraging social acceptance of children with disabilities is inclusive education.

According to UNESCO, Inclusive Education..."A process of addressing and responding to the diversity of needs of all learners through increasing participation in learning, cultures, and communities, and reducing exclusion within and from education". (UNESCO, 2009)

John Hattie (2012)., a prominent education researcher, defines inclusive education as "An approach to schooling that aims to increase access and engagement in learning for all students by identifying and removing barriers that may prevent some students from participating fully".

According to the National Education Policy (NEP), 2020 Teacher education is vital in creating a pool of schoolteachers to shape the next generation. Developing diverse perspectives and knowledge, forming attitudes and values, and practicing under the finest conditions are all necessary components of teacher training. Indian language, knowledge, customs, ethos, and values must all be ingrained in educators. Knowing the most recent developments in schooling and cultural practices, such as tribal customs and training.

Educators who are unprepared or uncomfortable with the notion of inclusion might pass on their dissatisfaction to their students, undermining their faith and achievement. Teachers who embrace and embrace the principle of inclusion, on the other hand, may give special education children confidence and a pleasant learning atmosphere. The emergence of a conventional and negative attitude towards the teaching of children with special needs in a regular classroom has resulted in a lack of knowledge. Various studies have found that male educators had a less favorable viewpoint toward inclusive education for the disabled than female educators.

Ms. Jmot, elaborates that "Teacher education refers to the policies and procedures designed to equip prospective teachers with the knowledge, attitudes, behaviours, and skills they require to perform their tasks effectively in the classroom, school, and wider community".

Specific learning disability refers to a broad category of disorders characterized by, ongoing challenges in acquiring and applying proficient reading, writing, or math skills, even in the face of conventional instruction, intact senses, normal intelligence, appropriate motivation, and sufficient socio-cultural opportunities.

The Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV states that learning disabilities are identified when a person performs much less well than one would anticipate for age, education, and intellect on independently administered, standardized reading, math, or writing tests. In India learning disability is one of the major concerns in primary education. Many classroom teachers in typical mainstream schools in our nation are not well-versed in specific learning disabilities. In recent years, there has been a significant increase in the number of children identified with certain learning difficulties. Certain learning problems in children with disabilities are frequently misdiagnosed or left untreated.

The Rights of Persons with Disabilities act 2016 provide the definition of specific learning disabilities *"specific learning disabilities" means a heterogeneous group of conditions wherein there is a deficit in processing language, spoken or written, that may manifest itself as a difficulty to comprehend, speak, read, write, spell, or to do mathematical calculations and includes such conditions as perceptual disabilities, dyslexia, dysgraphia, dyscalculia, dyspraxia and developmental aphasia* (RPWD, 2016)

In recent years, the number of children diagnosed with certain learning problems has increased substantially. Specific learning problems are frequently misdiagnosed and misunderstood in children with disabilities. There is tremendous uncertainty and dispute, not just across experts and families, but also among others in the community, over such fundamental issues as, what is a specific learning disability? And exactly might certain learning challenges be explained to students? Students who have specific learning disabilities may do more well in school if teachers assist them in developing comprehension, retention, writing, and vocabulary.

The Rights of Persons with Disability Act of 2016 (RPWD) defines learning disabilities as particular types of disabilities and outlines the steps that can be taken to support inclusive education. Chapter 3 discusses the need for educational institutions to offer inclusive education in order to identify children's unique learning difficulties as soon as possible and implement the necessary pedagogical and other interventions to help them. Additionally, it contains provisions for creating a sufficient number of resource centres to support educational institutions at all levels of school education, training professionals and staff to support inclusive education at all levels of education

and modifying the curriculum and examination system appropriately to meet the needs of students with special needs.

Sarojiny (2000) carried out a study on primary school teachers' awareness of learning difficulties in English at the primary level. The study's goals were to increase educators' awareness of learning impairments in English at the primary school level and to evaluate educators' awareness of learning disabilities in English. The study's findings indicated that there was a need to raise primary school teachers' understanding of learning difficulties because the teachers' level of awareness was poor.

Gandhimati (2010) conducted research on primary school teachers' awareness of learning disabilities. The purpose of the study is to evaluate the degree of knowledge that primary school teachers have about learning impairments, investigate the factors that influence this knowledge, and recommend corrective actions to teachers for working with students who have learning disabilities. The study's participants included of 80 primary school teachers in Triuverumbur block, Tiruchirappalli. 16 schools were chosen by lottery, and 71 teachers in these 16 schools provided data for the collection. It was discovered that the majority of respondents—66.2%—had a low general level of awareness regarding learning disorders.

Shukla P. Agrawal G. (2015) examined the knowledge and awareness of Learning disability among primary school teachers. 68 primary school teachers from 15 schools were chosen for an exploratory study using the lottery method in the Haridwar region. The study discovered that elementary school teachers had little understanding or awareness of learning difficulties.

Purpose of the Study

The purpose of the study is to identify the Perspective of Primary School Teachers toward Inclusive education for Students with Specific Learning Disability. This study also focuses on the barriers that influence the attitudes of teachers at the primary level.

The purpose of a study from the perspective of primary school teachers toward inclusion for students with specific learning disabilities is to investigate and understand how teachers perceive and approach the practice of inclusive education for students with specific learning disabilities (SLD) in their classrooms.

Methodology

The study's design was a preferred type of descriptive research since it described pre-existing circumstances. Bearing the study's aims in consideration a convenient sampling technique was used to collect a sample from the target population. A group of 30 primary school teachers was chosen from the Delhi NCR. A self-developed interview schedule consisting of 20 items/statements was used for gathering data. The schedule comprised variables such as: goals and objectives, curricular and co-curricular activities, teacher-student connection, teaching technique, accomplishment, teaching aids, and assessment.

Public perceptions have been regarded as one of the most significant hurdles to equitable education and, as a result, the presence of children with disabilities in schools in India. The effectiveness of children with disabilities inclusion in educational settings is heavily dependent on the attitudes of parents, teachers, and school officials.

Result

The study revealed that the majority of primary teachers were aware of the term specific learning disability. The findings are derived through interview schedule to determine how teachers' attitudes regarding inclusive education differ. The majority of teachers at the school possess a moderately good attitude towards inclusive education.

Researcher also observe that, a favourable teachers attitude towards inclusion generally emerges during pre-service teacher education.51% of those interviewed had an optimistic view regarding inclusive education for children who had specific learning disabilities, while 49.4% had a negative opinion.

Another problem that came up in the interviews with teachers was their lack of preparation to cope with inclusive classrooms, which was a big worry expressed by professionals of students with disabilities.

Discussion

The primary school teachers' perspective on inclusive education for children with particular learning difficulties is highlighted by the present study. According to the study, the teachers' understanding of specific learning disabilities and inclusive education is mediocre, and they have a favourable attitude toward teaching children with special learning disabilities in an inclusive classroom. The study demonstrates that educators are inadequately knowledgeable about the educational resources available to students with particular learning difficulties, which causes these students to be unaware of and unable to access these resources. The knowledge of primary school teachers is positively correlated with their attitude, and the teachers who studied specific learning disorders in their teacher training program have better knowledge.

Conclusion

The present research investigation of primary school teachers focuses on their understanding of and views towards including students with specific learning disabilities in their classrooms. According to the findings of the study, educators have a satisfactory amount of understanding of specific learning disabilities and inclusive education, as well as a good attitude towards inclusive education of children with special learning disabilities. According to the study, teachers lack appropriate understanding on educational provisions for children with special learning disabilities, resulting in children with specific learning disabilities being ignorant of and unable to receive such advantages.

Teachers who studied specific learning disorders in their teacher training programmes had superior knowledge, and there is a favourable association between primary school teachers' knowledge and attitude

References

Moothedath, S., & Mysore, N. V.. (2016). *Attitude of Primary SchoolTeachers towards Children with Learning Disabilities*. 12, 323–335.

Dhindsa, H., Borana, H., Yadav, J., Jangid, J., Gharu, K., Khawa, S. P., & Kumar, A.. (2021). *Knowledge regarding learning disabilities in children among primary school teachers*. *9(1)*, 235–239.

Shukla, P., & Agrawal, G. (2015). *Awareness of Learning Disabilities among Teachers of Primary Schools*. *1*, 33–38.

Thomas, E. K., & Uthaman, S. P. (2019). *Knowledge and Attitude of Primary School Teachers towards Inclusive Education of Children with Specific Learning Disabilities*. *4(2)*, 23–33.

Lingeswaran, A. (2013). *Assessing knowledge of primary school teachers on specific learning disabilities in two schools in India*. *2*. https://doi.org/10.4103/2277-9531.115807

Perspective of Special Educators towards Gamification for Children with Special Needs: Promoting Sustainable Learning

Gargi Sharma* & Dr. Sampurna Guha**

* Student, Integrated B.Ed-M.Ed Special Education *(Specific Learning Disability)*

** Assistant Professor Amity Institute of Rehabilitation Sciences, Amity University, Uttar Pradesh

ABSTRACT

In 21st century Inclusive Education setup constant demand for coming up with new teaching techniques based on techno-pedagogic approach which is more child centric in nature. One such technique is usage of gamification for promoting sustainable learning among the diverse learners. As the usage of gamification for pedagogical purpose works as remedy for the children with special needs who find themselves alienated by the classical methods of teaching and learning both at school. In recent years gamification has become a perceptible word in the domain of education as it makes learning process more motivating and engaging. The research tries to find out the perspective of the Special Educators towards the usage of gamification for the children with Special Needs. For the research survey method is used in which questionnaire is provided to the Special Educators (in-service and pre-service) working with Children with Special Needs to know their perspectives over the usage of gamification technique to enhance their Sustainable learning. The findings highlighted that the perspective of the special educators was largely positive towards the usage of the gamification. The study highlighted that majority of the participants expressed that gamification based learning is a very valuable approach for Children with Special Needs which focus on their unique strengths and needs.

Keywords: - Children with development disability, Engagement, Gamification, Motivation, Sustainable learning, Techno-pedagogic approach.

Introduction

The Gamification technique is receiving a lot of attention as well as desirability in the educational domain, particularly to enhance the learning process of the diverse learners. Gamification technique is gaining a lot of popularity in comparison to the traditional methods. As inclusive setups are becoming popular, the usage of Gamification technique is also gaining popularity for enhancing the Sustainable Learning of Children with Special Needs by improving their engagement and motivation.

Gamification is a technique which refers to the use of game to involve, engage as well motivate the learners to achieve the set goals and objectives. Gamification technique can use the leader boards, levels, badges, rewards, quiz's, surprises ,role-plays and progress bars which are used for the completion of a particular task. The definition of gamification is the application of the game-like methods to the non-game methods to achieve a particular set goal (Deterding et al. 2011).

Gamification technique can be used for personalized and differentiated instructions, it can be used to improve the potential for the existing learning models like blended or project based learning, for involving learning progress of other stake holders like parents, it helps in promoting strategic as well as critical thinking, it motivates and supports children with diverse needs (Teach Thought Staff, 2014).

Sustainable learning refers to the learning practices which adopts a holistic approach towards the education of the diverse learners (Canrad 2019).So Sustainable learning focuses upon "learning that lasts"(Graham,Berman& Bellert,2015). This form of

learning should focus upon development of future-focused skills as well as experiences which provides them confidence and awareness regarding contributing positively to the world (Hays & Reinders, 2020).Sustainable learning must provide the diverse learners with various opportunities to engage them in various hands-on learning activities

Children with Special Needs are those learners who require certain special assistance or care due to certain difference in their physical, cognitive, emotional as well as developmental needs. The Convention on the Rights of Persons with Disabilities points out that the extent to which the Children with Special Needs are able to function, participate as well as lead their lives depends on the extent to which they are provided with the accommodations and are included in the society.

Gamification technique plays a very crucial role in promoting the sustainable learning among the diverse learners through fun based interactive activities. This technique can motivate diverse learners to explore better concepts in a more meaningful way. The technique will support in creating a culture of Sustainable learning among the diverse learners which can be extended to their community, workplace and beyond. Gamification can be an effective tool used for Sustainable learning by engaging the diverse learners, providing them immediate feedback as well as promoting positive behaviour changes. Educators must be equipped with the needed knowledge as well as the skills necessary to incorporate the Gamification technique for providing sustainable learning to the diverse learners in the Inclusive setups.

Purpose of the Study

The main purpose of the study is to find out the perspective of the both pre-service and in-service Special educators on the use of gamification for providing Sustainable learning to Children with special Needs. I tried to identify the Special educator's basic knowledge regarding the gamification techniques as well as their individualized perspective regarding the benefits and challenges they feel regarding the implementation of this technique with the Children with Special Needs for enhancing their sustainable learning.

Methodology

Participants

There were total 60 participants (30 pre-service special educators and 30 in-service special educators), primarily females. Their age ranged between 20 to 45 years. Who were from Diploma, Graduation as well as Masters level.

Methods and instruments

A self- designed questionnaire which contained 10 questions regarding the Gamification technique, its benefits, its challenges and can it enhance the Sustainable learning of children with Special Needs in an Inclusive Classroom. This questionnaire was provided to the Special Educators in the form of a Google form where they have to select a correct option as per their perspective.

Results

This study revealed that majority of the Special Educators both the in-service as well as the pre-service majorly recommend the use of gamification technique in enhancing the sustainable learning for Children with Special Needs in the inclusive classrooms. The participants viewed that the gamification technique enhances the engagement, enthusiasm as well as the motivation of the leaner's towards the teaching-learning process. However most of the educators pointed it out that this technique is a long term solution for sustainable learning of learner with special needs but should be used with proper organization and planning and the challenges which come with it

should be considered while using it. The special educators even viewed that the gamification technique should be adapted and modified as per the individualized strengths and needs of the diverse learners in the inclusive setups. They even pointed out that the compilation of the methods like pre and post assessment, student and parents feedback as well as observation to be used to measure the effectiveness of the usage of gamification technique in supporting the Sustainable learning of learners with Special Needs in Inclusive Classrooms.

Table 1. Special Educators Perspective regarding the use of Gamification technique for sustainable learning

Question	*Percent which supported option 1*	*Percent which supported option two 2*	*Percent which supported option 3*	*Percentage which supported option 4*
1. What is your opinion on incorporating Gamification for Sustainable learning for CWSN?	29% supported I believe it is beneficial for sustainable learning.	Nil supported I believe it is not beneficial for sustainable learning.	1.6% supported I am unsure.	69.4% supported I believe it is beneficial but proper strategies should be used.
2. Which of the following benefits do you think Gamification can provide for CWSN's for developing Sustainable Learning?	22.6% supported It can support in increased engagement.	9.7% supported It can support in improved motivation.	4.8% supported better retention of information.	69.4% selected all of the above.
3. How do you think Gamification compares to traditional instructional methods?	54.8 % supported Gamification is more effective for sustainable learning.	1.6 % supported traditional instruction methods are more effective for sustainable learning.	40.3% supported both methods are equally supportive for sustainable learning.	3.2 % selected I am confused.
4. How do you believe Gamification can support Sustainable learning for CWSN's?	17.7% supported by providing a more interactive and engaging learning experience.	9.7% supported by providing them various opportunities for personalized learning.	72.6% supported all of the above.	Nil supported none of the above.

5. Have you ever implemented or seen the usage of Gamification technique?	67.7% selected yes, and it's resulted in increased sustainable learning.	4.8 % selected yes, but outcomes were not significant.	27.4% selected no, but I am interested in incorporating it in the future.	Nil selected no, I do not believe it would be beneficial.
6. Do you think Gamification is a long term solution?	14.5% selected long-term solution.	3.2% selected temporary solution.	17.7% selected unsure.	64.5% selected yes it is a long-term solution but should be implemented with proper planning.
7. What adjustments do you think need to make it more effective for sustainable learning?	37.1% selected more adaptation and accessibility to be incorporated.	6.5% selected more lesson plans that incorporate Gamification.	53.2% selected all of the above.	3.2% selected none of the above.
8. What type of Gamification technique do you prefer?	11.3% supported game-based, quests and storylines.	4.8 % selected points system, badges and leader boards.	80.6% selected all of the above as per the demand.	3.2 % selected none of the above
9. What can be the most appropriate way to measure the effectives of Gamification?	9.7% supported pre and post assessment.	9.7% supported student and parent's feedback.	3.2% supported observation.	77.4% supported all of the above.
10. Concern about implementing Gamification?	14.5 % selected concerns about its accessibility for CWSN's.	16.1% selected concern about the cost.	67.7% selected all of the above.	1.6 % selected none of the above.

Discussion

The results of this research underline the fact that the Special Educators hold positive outlook towards the usage of the gamification technique towards enhancing the sustainable leaning

As according to them Gamification technique provides moderns means of teaching -learning process. This is also conclusion presented by the article , From Boredom to Engagement : The Role of Gamification in Indian education (2023) that the Gamification technique holds potential to engage and motivate the learners as it enhances their learning experiences. In which it was also highlighted that the traditional teaching methods were not as effective as compared to the Gamified learning.

The gamification technique enhances Sustainable learning rather than rote learning. This is conclusion presented in the article by Mamoona, et al. that the learners who were provided instruction under Gamification technique were able to do better in assignment as compared to students who were involved in rote learning. The exam scores of the Gamified group were also high.

The Gamification techniques help in nurturing the Inclusive environment in the class. This is a conclusion presented by the article, Play and learn (2021) from the Hindu that the Gamification technique is a very effective and engaging teaching-learning process for the diverse learners in the classroom.

It help in holistic growth of Children with Special Needs. This is also a conclusion presented by Cavus., et al. (2023) that Gamification technique enhances the self-regulation, motivation level, creativity, social awareness, collaboration as well as socio-communication skill among the diverse learners.

Conclusion

This research revealed that the Special Educator supported the usage of the gamification techniques for achieving the sustainable learning of Children with Special Needs in the inclusive setups. As this technique enhances the engagement, motivation as well as enthusiasm which eventually boosts their learning outcomes as well as the achieved results are sustainable. The gamification techniques supports the holistic development of the learners with diverse needs by stimulating various skills among them like creativity, collaboration, problem-solving, critical thinking to be mentioned a few. One of the limitation of the study is that it's sample size is relatively low and hence it cannot be generalized. Additionally, the study design only considered the perspective of special educators. Based on this study , it is recommended that more such researches should be done with larger sample sizes where the perspective of general educators as well as the parents of Children with Special Needs should be reviewed. As well as more survey based as well as experimental studies should be done regarding the usage of gamification technique for children with special needs in Indian context. Overall, the Gamification technique for enhancing the Sustainable learning among the Children with special Needs has enormous potential for nurturing the inclusive environment in the 21st century classrooms.

References

Akçayır, M., &Akçayır, G. (2017). The effect of gamification on motivation and engagement. Journal of educational computing research, 55(5), 662-693. Retrieved from https://www.researchgate.net/publication/321063416_The_Effect_of_Gamification_on_Motivation_and_Engagement

Bernacki, M. L., Aguilar, A. C., & Byrnes, J. P. (2017). Mindfulness practices in education: Montessori's approach. NAMTA Journal, 42(1), 1-13. Retrieved from https://files.eric.ed.gov/fulltext/EJ1176165.pdf.

Deterding, S., Sicart, M., Nacke, L., O'Hara, K., & Dixon, D. (2011). Gamification and education: A literature review. In Proceedings of the 2011 Annual Conference Extended Abstracts on Human Factors in Computing Systems (pp. 2425-2428). ACM. Retrieved from https://www.researchgate.net/publication/266515512_Gamification_and_Education_a_Literature_Review.

Fortune India. (2019, April 17). Gamifying education: Making learning fun. Fortune India. Retrieved from https://www.fortuneindia.com/ideas/gamifying-education-making-learning-fun/110937

Hadi, S. (2018). The Effect of Gamification on Motivation and Learning Outcomes in Middle School Science Classes. Journal of Education and Practice, 9(30), 118-129. Retrieved from https://files.eric.ed.gov/fulltext/EJ1209291.pdf.

Kappen, D. L., Nacke, L. E., & Gerling, K. M. (2012). A litmus test for game-based learning: Increasing learning outcomes. In Proceedings of the 6th European Conference on Games-based Learning (pp. 161-168). Retrieved from https://ixdea.org/wp-content/uploads/IxDEA_art/53/53_1.pdf.

Karakus, T. (2020). Gamification in Education (Doctoral dissertation). Retrieved from https://www.researchgate.net/publication/344433560_Gamification_in_education

Khalid, M., Fong, S. F., & Nasir, M. H. N. M. (2019). The effectiveness of gamification in a cultural context: A study of programming module for first-year university students. Computer Applications in Engineering Education, 27(7), 1980-1991. doi: 10.1002/cae.22428. Retrieved from https://onlinelibrary.wiley.com/doi/10.1002/cae.22428

Plăinescu, A. A., &Plăinescu, D. I. (2020). Technology-enhanced learning in higher education: A review. BRAIN. Broad Research in Artificial Intelligence & Neuroscience, 11(1), 97-112. Retrieved from https://lumenpublishing.com/journals/index.php/brain/article/view/6086/4393.

Scoo News. (2019, November 12). From Boredom to Engagement – The Role of Gamification in Indian Education. Scoo News. Retrieved from https://scoonews.com/news/from-boredom-to-engagement-the-role-of-gamification-in-indian-education/

Singh, M. (2021, June 6). How gamification can transform education. The Hindu. Retrieved from https://www.thehindu.com/education/how-gamification-can-transform-education/article34796220.ece

The Logical Indian. (2021, April 7). Gamification: A technique to make learning fun and engaging. The Logical Indian. Retrieved from https://thelogicalindian.com/education/gamification-36972

Wang, R., Chen, F., & Liang, Y. (2019). The effects of gamification in online learning environments: A systematic literature review. Journal of Educational Technology & Society, 22(3), 253-276. Retrieved from https://www.researchgate.net/publication/335141284_The_Effects_of_Gamification_in_Online_Learning_Environments_A_Systematic_Literature_Review.

Impact of Gamification in Learning Grammar Skills among Children with Autism Spectrum Disorder: Case study

Jayati Mitra*

* *Special Education Teacher, SEC, NIEPID, Secunderabad*

ABSTRACT

Gamification is a developing educational approach in recent century. Gamification refers to transforming a boring or mundane task into a fun one by applying the principles that make games engaging. By adding elements such as competition between various users, an otherwise-boring process can become interesting, sometimes even addictive. Grammar is defined as a system of language rules that allows combining individual words to make complex meanings. Autism spectrum disorder (ASD) refers to a neurodevelopment disorder that is characterized by difficulties with social communication and social interaction and restricted and repetitive patterns in behaviours, interests, and activities. (American Psychiatric Association [APA]). Studies have shown that children who struggle with autism see an improvement in motor, behavioral, and communication skills by using gamification. All of these skills can be positively impacted through the use of gamification in educational settings. Several studies have demonstrated the effectiveness of using online tools and games to teach grammar. The study found that Gamified grammar learning had a significant positive impact on the academic achievement of 6th grade students (Selim Soner Sütçü, 2023). Pham and Pham also found that teachers had positive perceptions of the pedagogical value of gamification in English grammar teaching. The objective of the study was to find out the impact of Gamified learning on grammar skills among two 12 years boys diagnosed as Autism Spectrum Disorder studying NIOS-OBE class. It was a qualitative research design. Purposive sampling was done for this study. Both the children were aware about Basic English of class 3 level. Online game based learning content was selected to find out the effect of gamification. Intervention done for 3 months and the scores of pre-test and post test were compared for the individual children. There was positive impact on learning grammar skills through game based e-content. The rate of learning other skills related to academic, social, communication and language skills were also high.

Key Words: Gamification, Online learning content, NIOS-OBE, Autism Spectrum Disorder.

Introduction

Gamification is a developing educational approach in recent century. Gamification refers to transforming a boring or mundane task into a fun one by applying the principles that make games engaging. By adding elements such as competition between various users, an otherwise-boring process can become interesting, sometimes even addictive. Gamification of E-Learning is used to increase learner engagement in the classroom by adding video game elements such as score and points to the e-learning material. Gamification also involved making the learning material itself, interesting to increase engagement of the students. Students find dragging and dropping of text and pictures on the smart board, interesting.

Grammar is defined as a system of language rules that allows to combine individual words to make complex meanings. Strong vocabulary and grammatical abilities are important throughout development, and difficulties with language can increase an individual's risk of negative academic, occupational, and social outcomes.

"Grammar is the structural foundation of our ability to express ourselves. The more we are aware of how it works, the more we can monitor the meaning and effectiveness of the way we and others use language. It can help foster precision, detect ambiguity, and exploit the richness of expression available in English. Additionally, it can help everyone, not only teachers of English, but teachers of anything for all teaching grammar is ultimately a matter of getting to grips with meaning".(Crystal,2004)

Several studies have demonstrated the effectiveness of using online tools and games to teach grammar. The study found that Gamified grammar learning had a significant positive impact on the academic achievement of 6th grade students (Selim Soner Sütçü, 2023). Pham and Pham also found that teachers had positive perceptions of the pedagogical value of gamification in English grammar teaching.

Autism spectrum disorder (ASD) refers to a neurodevelopment disorder that is characterized by difficulties with social communication and social interaction and restricted and repetitive patterns in behaviours, interests, and activities. (American Psychiatric Association [APA]). Linguistic and cognitive abilities manifest huge heterogeneity in children with autism spectrum disorder (ASD). Some children present with commensurate language and cognitive abilities, while others show more variable patterns of development. Studies have shown that children who struggle with autism see an improvement in motor, behavioral, and communication skills by using gamification. All of these skills can be positively impacted through the use of gamification in educational settings.

Aim of the Study

The aim of the study was to find out the effect of Gamified learning on grammar skills among children with Autism Spectrum Disorder having.

Method and Materials

Two boys of 12 years were selected for this study. They are studying in NIOS-OBE class level B. Both the boys were diagnosed as Mild Intellectual Disabilities having Mild Autism Spectrum Disorder. Child A knew the basic grammar like identifying nouns, Verbs and adjectives whereas Child B knew only Noun. Qualitative research design was used for this study. Purposive sampling was used. Parental interview was done and case history record was referred to get the information about the child. Observation, direct and indirect testing was also done to gather information about the child. Both the students were in Instructional level in English subject according to GLAD assessment tool. (Child A was at 52% and Child B was at 46%). In this study EdQueries E-Learning package was used on a smart board so scores at the end of each activity were used to motivate the students. Formative and summative evaluation was done to find out the progress of the child.

Results

The children were given three months continuous training at home and school on learning Grammar skills (For Child A concept about Adverb and for child B was the Concept about Verb). In the pre test Child A scored 43% in adverb skills and Child B was 20% in verb concept. The graded task presentation, dragging game, sorting game, fill in blanks by pictorial clues, identification games were introduced through digital worksheets. All the activities were ended with the scoring reinforcement. The immediate feedback was given to the children after every wrong answer which was leading the children to correct themselves and made them independent in learning by their own pace. Post test scores child A was 70% and for child B was 71%. This study result correlates with the finding about the digital environments supported by games with

visual stimulate the assimilation and significance of the experience, increasing learning and reducing the cognitive load (Lozano et al., 2012; Wang et al., 2022). Thus, the gamification of activities in digital environments and the serious games dispense rewards that facilitate individual progress according to the maturational rhythms of people with ASD (Kientz et al., 2013).

The higher performances in activities occurred due to sequential presentation of the tasks along with visually structured instructions and schedules. These positive results also found due to utilizing the effective instructional materials, settings, less environmental hazards, contents related to the levels of the students, appropriate presentation of reinforcement and researcher's skills and hard working during the intervention program. As a result of intervention the students not only learned specific skills but associated learning also took place. Associated learning took place in areas of general skills which include skills such as student's attention span, ability to filter information, ability to make choices from many given options; student's instruction following intensity. There is some evidence to suggest that a child centered, rather than teacher led approach, is more effective in facilitating play. Typically developing peers can also be paired with the autistic child, and encouraged to follow the lead of the autistic child. This type of less structured and more naturalistic approach has shown promising signs of improving the social interaction of autistic children (Parsons,et,al; 2011)

Conclusion

In this success there is an effortless and continuous supports, assistance from their mothers and family members helped them to learn the grammar concept through game based content.

In conclusion it can be said that Continuous practice, follow up, proper supervision and parent training programme will help the individual to learn more academic skills through customized e-learning packages.

References

Wittke, K. et.al; (2017).Grammatical Language Impairment in Autism Spectrum Disorder: Exploring Language Phenotypes Beyond Standardized Testing. Frontires in Psychology. Vol 8,P:532 (doi: 10.3389/fpsyg.2017.00532)

Hilvert, E., & Sterling, A. (2019). Vocabulary and grammar development in children with autism spectrum disorder, fragile X syndrome, and Down syndrome. In R. M. Hodapp & D. J. Fidler (Eds.), *International review of research in developmental disabilities* (pp.119–169). Elsevier Academic Press. https://doi.org/10.1016/bs.irrdd.2019.07.003

L. Nerea & M. Esther Del Moral (2023). Gamified Environments and Serious Games for Students with Autistic Spectrum Disorder: Review of Research . (2023).Review Journal of Autism and Developmental Disorders American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. 5th ed. (DSM-V).American Psychiatric Publishing; Arlington, VA, USA: 2013. pp. 853–854.

Government of India, " The Persons with Disabilities –Equal Opportunities , Protection of Right and Full Participation Act,1995 and replaced with RPWD Act,2016;MSJ&E, New Delhi

UDL Practice for Empowering Students with Disabilities in the Inclusive Education Programme at Primary Education Level

P. Kamaraj*, M. Ramya**, & Dr. D. Revathi**,
* HOD- Special Education, NIEPMD, Chennai
** Lecturer, Department of Special Education, NIEPMD, Chennai

ABSTRACT

The universal design ensures access and maximizes the utility of the consumers in every services. Universal Design for Learning (UDL) focuses on developing flexible, responsive, and diverse instructional strategies, materials, assessments and it promotes an inclusive learning environment in which every student can thrive academically and socially. An inclusive education program which is promoting sustainability and cost effective in nature is practiced all over the world.UDL practice would be addressing the needs of diverse learners in the classroom participating in the inclusive education programme. This article examines the successful implementation of Universal Design for Learning (UDL) practice in a government middle school, of Chennai block, which practices inclusive education programme. The intervention was tailored to 4thgrade including the children with disabilities on the Environmental Science subject at primary level. The study involved pre & post-test method. This study was conducted over a period of three-month duration with two times of intervention per week. The results showed significant improvement with the children on learning EVS subject through UDL practice in the classroom. It is suggested to practice the UDL practice widely.

Key words: UDL, Inclusive Education, Students with disabilities.

Introduction

In the recent years, the global educational settings has experienced a significant pattern moved towards inclusive education. The inclusive education model visualizes as a cost effective learning environment.

The concept of Universal Design for Learning (UDL), an approach that emphasizes flexibility, responsiveness, and diversity in instructional strategies, materials, and assessments. UDL aims to create an inclusive learning environment where all students, including those with disabilities, can flourish academically and socially. Children with Disabilities encompass a diverse range of abilities and challenges, which covers physical disabilities, sensory impairments, learning disabilities and developmental disorders. On related to the diversity necessitates a flexible and accommodating approach that can address individual needs, promote engagement, and facilitate optimal learning outcomes(Artiles et al., 2019). The implementation of inclusive education at the primary level having more challenges, which includes overcrowded classrooms, a shortage of trained teachers, limited access to assistive technology and inadequate resources(Sailor,2008). These difficulties can inhibit the effective inclusion of students with disabilities through UDL approach.

Samacheer Kalvi or Equitable education system is a School Education progrmmme in Government of Tamil Nadu. This programme is to integrate the various school educational systems within the state of Tamil Nadu. An inclusive education program which is promoting sustainability and cost effective which is practiced all over the world. UDL practice would be addressing the needs of diverse learners in the classroom and maximize the participation on providing multiple means of representation in input process and out of learning experiences. This article examines the successful implementation of Universal Design for Learning (UDL) practice in a government middle school, of Chennai block, which practices inclusive education programme. The

intervention was tailored to 4th grade including the children with disabilities on the Environmental Science subject at primary level

Purpose of the Study

The purpose of this study is to investigate and evaluate the effectiveness of Universal Design for Learning (UDL) practices in empowering students with disabilities within the framework of an inclusive education program at the primary education level. The study aims to assess the impact of UDL strategies on academic performance, engagement, and the overall learning experience of children's with disabilities, with the ultimate goal of promoting inclusive and accessible education

Objectives of the Study

- To identify the specific learning style of the learners which contribute to improved academic performance and engagement of students at primary level
- To develop the learning activities with the consideration of UDL practices on the academic performance of students with disabilities in EVS
- To measure changes in student engagement resulting from UDL implementation.
- To identify effective UDL strategies for diverse learners.
- To evaluate the sustainability and cost-effectiveness of UDL in inclusive education.

Hypotheses

- There is no change in learning environmental science through UDL approach by children attending 4th standard of Samacheer kalvi.
- There is no change in performance of children on learning five landforms of the content, through UDL approach.
- There is no change in performance of children on learning Physical features of landforms of the content, through UDL approach.
- There is no change in performance of children on learning Kingdoms of river of the content, through UDL approach.

Methodology

The 4th grade students for children with disabilities on the Environmental Science subject at primary level in Government school Chennai. Totally 4 no of children with intellectual disability are included in the study.

This study was conducted over a period of three-month duration with two times of intervention per week given for 4th grade students in government school Chennai including children with disabilities. The study involved pre & post-test method. The analyses is done after the intervention using statistical package SPSS, T-test. Quantitative data is collected through Achievement test on the content set for the children to learn through UDL approach. The content set contains totally 15 MCQ questions. Intervention given through UDL approach in environmental science subject for 4th standard students at primary level. Two lesson are taken from environment science subject (Term 1) Kingdom of River and five landforms, MCQ are design from three content, each content have five MCQ, total=15 MCQ. Content 1= Five landforms, Content 2= Physical features of landforms, Content=3 Kingdoms of river.

Table1: Distribution of content

Environmental science lesson 4thStd Samacheer Kalvi ,TN	Content 1	Content 2	Content 3
Lesson- 1.Kingdom of River 2.Five landforms	Five landforms	Physical features of landforms	Kingdoms of river
Total 15 questions Are taken from all content	5 MCQ	5 MCQ	5 MCQ

Table 2: Details of participants

Sl. No	Students name:	Types of disability
1.	Sample 1	Intellectual disability
2.	Sample 2	Intellectual disability
3.	Sample 3	Intellectual disability
4.	Sample 4	Intellectual disability

Review of Literature:

Table 3: Review of literature

Author name	Year	Method of study	Findings
Krishan & Sharma	**2023**	Surveyed to find out the awareness on UDL practice in inclusive education programmme	Reported that the general education teachers have limited awareness on UDL
Lee & Griffin	**2021**	Developed online modules on UDL lesson plan for pre service teacher	Empowered the teachers to develop UDL lesson plan
Tanmoy Bhattacharya	**2017**	To Adapt UDL for learning in inclusion	Recommends the adoption of Universal Design for Learning to achieve meaningful inclusion in the education of disabled children/students.

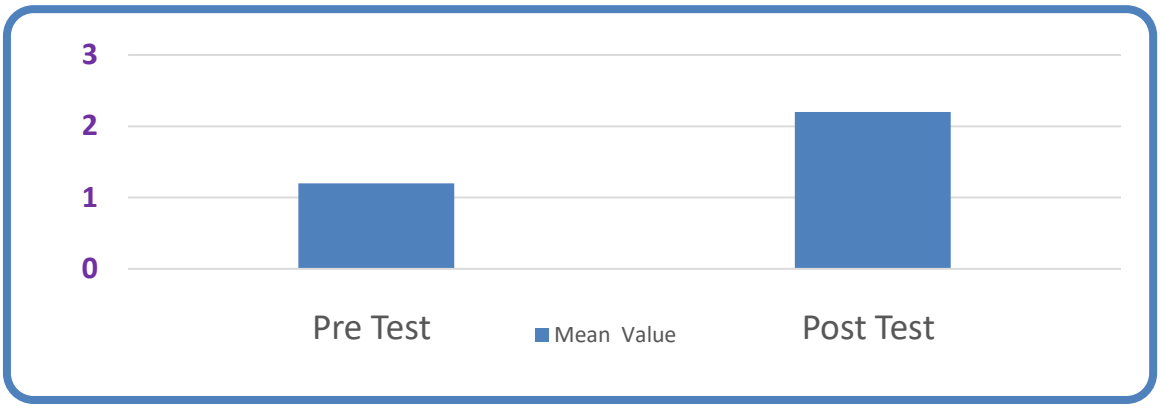
Results and Interpretation

Hypotheses 1: There is no change in learning environmental science through UDL approach by children attending 4th standard of Samacheer kalvi.

Table 4: Table showing the result on learning environmental science through UDL approach.

Domain:	N	Mean	S.D	df	't' value	Sig
Pre-test	4	1.20	0.68	14	3.77	0.005
Post-test	4	2.20	0.77	14		

Figure 1: Graphical representation of result on performance of student in learning Environmental science



Interpretation:

- The t-value of 3.7668 suggests a statistically significant increase in Environmental Science learning among students with disabilities when UDL (Universal Design for Learning) practices are employed with a pre & post-test method.
- The pre-test mean score was 1.20, indicating the initial level of Environmental Science knowledge among the students with disabilities. After the implementation of UDL practices and the pre & post-test method, the post-test mean score increased to 2.20.
- The t-value is obtained as 3.7668 at 0.05 level shows significant difference on learning environmental science among the children attending 4th standard. Therefore, the null hypothesis is rejected.

Hypotheses (2): There is no change in performance of children on learning five landforms of the content, through UDL approach.

Table 5: Table showing the result on learning five landforms through UDL approach.

Five landforms	N	Mean	S.D	df	't' value	Sig
Pre-test	4	1.2	0.80	4	2.14	0.005
Post-test	4	2.0	2.00	4		

The post-test mean score increased from 1.20 to 2.00, with a t-value of 2.13809 and a p-value of 0.032485 .The result shows a statistically significant improvement in children's performance when learning about five landforms through the Universal Design for Learning (UDL) approach. Therefore the null hypothesis is rejected.

Hypotheses 3. There is no change in performance of children on learning Physical features of landforms of the content, through UDL approach.

Table 6: Table showing the result on learning physical features landforms through UDL approach.

Physical features of landforms	N	Mean	S.D	df	't' value	Sig
Pre-test	4	1.20	2.80	3	1.89	0.005
Post-test	4	2.20	2.80	3		

The post-test mean score increased from 1.20 to 2.20, with a t-value of 1.88982 and a p-value of 0.047726. The result shows a statistically significant change in children's performance when learning about the physical features of landforms through the Universal Design for Learning (UDL) approach. Therefore null hypothesis is rejected.

Hypothesis 4. There is no change in performance of children on learning Kingdoms of river of the content, through UDL approach.

Table 7: Table showing the result on learning Kingdoms of river through UDL approach

Kingdoms of river	N	Mean	S.D	df	't' value	Sig
Pre-test	4	1.2	2.00	3	2.19	0.005
Post-test	4	2.00	0.80	3		

The data indicates a statistically significant change in children's performance when learning about the Kingdoms of a river through the Universal Design for Learning (UDL) approach. The post-test mean score increased from 1.20 to 2.40, with a t-value of 2.19089 and a p-value of 0.029919. Therefore, we reject the null hypothesis.

Findings

The findings of this study highlight a significant improvement in student performance and engagement in Environmental Science on learning the content landforms pre& post-test method and implementing UDL (Universal Design for Learning) practices. Specifically, the post-test scores exhibited a marked increase across all Content, including content 1=Five landforms, content 2=Physical features of landforms, and content 3=kingdom of river. This improvement emphasizes the effectiveness of the content -wise pre & post-test method in enhancing student engagement in various facets of Environmental Science.

Furthermore, the findings suggest that the integration of UDL practices, in conjunction with this assessment approach, has contributed to better instructional planning and delivery. This, in turn, has resulted in increased student engagement in the subject. The positive impact of UDL practices on instructional quality and student engagement is a significant discovery with implications for teachers and stakeholders in the field of education.

Conclusion

In conclusion, the results of this study provide absorbing evidence of the benefits of employing a across all Content, including Five landforms, Physical features of landforms, and kingdom of river pre & post-test method and integrating UDL practices in the teaching of Environmental Science. These findings highlight the importance of modifying instructional strategies to diverse learners and promoting an inclusive learning environment for children with disabilities.

The proven improvement in student engagement and performance highlights the potential of UDL practices to enhance the overall quality of education, particularly in the context of Environmental Science. Teachers and legislators can use these findings to implement at the policy level, development a more inclusive and effective educational environment for children with disabilities. The study conducted by Marino et.al. 2013 also found that the UDL practice empower the student with learning disabilities on learning science subject.

Recommendation

- The need for a school-wide implementation of UDL approach in inclusive settings for the benefit of diverse learner
- The UDL approach have to be incorporated in inclusive education programme
- To create more awareness on UDL practice
- To conduct training programme for in-service teachers on UDL approach

Reference

Artiles, A. J., Kozleski, E. B., Dorn, S., & Christensen, C. (2019). Learning in Inclusive Education Research: Re-mediating Theory and Methods with a Transformative Agenda. Harvard Education Press.

Avramidis, E., Bayliss, P., & Burden, R. (2000). A Survey into Mainstream Teachers' Attitudes towards the Inclusion of Children with Special Educational Needs in Ordinary Schools. Educational Psychology.

Bonati, M. L., & Andriana, E. (2021). Amplifying children's voices within photovoice: Emerging inclusive education practices in Indonesia. British Journal of Learning Disabilities.

CAST. (2018). Universal Design for Learning Guidelines version 2.2. Retrieved from https://udlguidelines.cast.org

Krishan, S., & Sharma, N. (2023). Awareness of Universal Design for Learning (UDL) among Teachers in India. Journal of Educational Technology Development and Exchange (JETDE).

Larios, R. J., & Zetlin, A. (2023). Challenges to preparing teachers to instruct all students in inclusive classrooms. Teaching and Teacher Education.

Lee, A., & Griffin, C. C. (2021). Exploring online learning modules for teaching universal design for learning (UDL): preservice teachers' lesson plan development and implementation. Journal of Education for Teaching.

Sailor, W. (2008). A Multilevel Ecology of Inclusive Schooling. European Journal of Psychology of Education.

Wilson, J., & Madhavan, V. Inculcating Inclusive Education: A Conceptual study on Management of Inclusive Education.

Bhattacharya, T. (2017). Adoption of universal design for learning for meaningful inclusion. Empowering children with disabilities.

Marino, M. T., Gotch, C. M., Israel, M., Vasquez, E., Basham, J. D., & Becht, K. (2013). UDL in the Middle School Science Classroom. Learning Disability Quarterly

Executive Functioning and Emotional Regulation of Children with Average and Borderline Intelligence

Mohan Kumar N* & Dr. Deyashini Lahiri*
*DRP, NIEPID mohankumarpsychologist@gmail.com deyashini.lahiri@gmail.com

ABSTRACT

Around 12.3% of people will come under the category of borderline intelligence in the world. In Borderline Intelligence the Intelligence Quotient (IQ)ranges between 1 & 2 standard deviations from the mean IQ. Emotion regulation is a skill that enables a person to control emotionally charged situations and flexibly handle them. Cognitive processes are a crucial component of how emotions are produced and managed. Executive function is a higher cognitive ability of an individual that involves the regulation of the cognitive process, which involves emotional regulation. The study aims to correlate and compare the executive functioning and emotional regulation of children with borderline and average intelligence. It is a descriptive research study composed of 60 children (30 borderline and 30 average intelligence) between the age ranges of 9 and 15 years of age who were selected by using the purposive sampling method. The scales used in this study were, the Difficulty in Emotion Regulation Scale-18, and the Emotion Awareness Questionnaire (EAQ-30). Executive functioning is measured using a subtest of NIMHANS Neuropsychological Battery for Children. The data were analyzed using SPSS-29. The results have found that significant differences exist in the N-Back test and Visuo-spatial Working Memory between children with Borderline and average intelligence. There is a significant difference exists in Emotional awareness and no difference exists in Difficulties in Emotional Regulation between children with Borderline and average intelligence. There is a negative relationship between Executive Function and Difficulties in Emotional Regulation (DERS). The negative relationship between emotional awareness (EA) and Difficulties in Emotional Regulation (DERS). This study reveals the relationship between cognitive abilities and emotional awareness. Children with borderline intelligence have lower ability in the area of executive functioning. They found that both children with borderline and average intelligence significantly differ in emotional awareness. A better level of emotional regulation lowers the level of difficulty in emotional regulation.

Keywords: *Executive Functioning, Emotional Regulation, Emotional Awareness, Borderline Intelligence, Average Intelligence.*

Introduction

Borderline intelligence is a diagnostic category in which the intelligence is at the level of below-average cognitive abilities, where the Intelligence Quotient (IQ) will range between one and two standard deviations from the mean IQ on the normal probability curve of the intelligence (Wieland & Zitman, 2016). Persons with borderline intelligence will have deficits in areas like problem-solving, emotional management, academic performance, and social interactions (Alesi et al., 2015).

Emotions occupy a place of greater importance in human life because they make it infinitely varied, thrilling, and beautiful Cognition and emotions are two independent systems that interact with each other (Ochsner & Phelps, 2007). Emotions are conscious mental reactions subjectively experienced as strong feelings usually directed toward a specific object and typically accompanied by physiological and behavioural changes in the body (APA, 2022). Studies have found a strong relationship between emotions and cognition which is bidirectional (Lazarus, 1991).

Cognition plays a regulatory role in emotional production and regulation (Preckel et al., 2011). Emotions help in the organization of individual thinking, learning, and action and cognition helps in emotional regulation (García-Andres et al., 2010).

The process or capacity through which we manage and regulate emotion is known as "emotional regulation, which is a "goal-directed process that influences the intensity, duration, and type of emotion experienced" (Thompson et al., 2008). Regulating emotion is an important aspect, if one fails to regulate emotions effectively has a high risk of developing conduct problems (Röll et al., 2012).

Executive function is a higher cognitive ability of an individual that involves the regulation of the lower cognitive process, which involves emotional regulation(Alvarez & Emory, 2006). Executive functioning is an important ability of an individual to regulate emotion and manage it (Ogilvie et al., 2011). Working memory plays an important role in emotional regulation by managing expressive suppression and cognitive reappraisal (Schmeichel et al., 2008). Working memory training was linked to improvements in emotional control, particularly in situational reappraisal, positive emotion control, and encouraging optimistic thoughts when faced with challenges (Barkus, 2020).

Fernandes et al. (2023) reveal that a lack of emotional management will leads to emotional issues including anxiety and depression. Individuals who have deficits in executive functioning will affect inhibition control which involves the suppression of socially inappropriate emotional expression (Schmeichel & Tang, 2015).

Purpose of the Study

The main aim of the study is to identify if is there any difference in executive functioning and emotional regulation of children with borderline and average intelligence. Researchers aim to find the difference in executive functioning ability, emotional awareness and difficulties in emotional regulation between the groups.

Methodology

The study population is composed of children with average and borderline intelligence between the age ranges of 9 to 15 years of age, who were selected by using the purposive sampling method. The sample size is 60 which includes children with average intelligence of 30 and children with borderline intelligence of 30.

A descriptive research design is employed in this study. The data was collected by using the instruments NIMHANS Neuropsychological Battery for Children (Kar et al., 2004), which includes1) Visuiosoaptial Working Memory Span Task (Milner, 1971) and N Back Task of Visuiosaptial Working Memory (Smith & Jonides, 1997) for measuring executive functioning. The test-retest reliability is 0.53 to 0.92.

Emotion Awareness Questionnaire (EAQ-30) (Rieffe et al., 2008) is used to measure emotional awareness whose reliability coefficient of correlation is 0.91.

Difficulty in Emotion Regulation Scale-18 (DERS-18: Victor & Klonsky, 2016)is used to measure any difficulty in emotional regulation. The DERS-18 uses a Likert-like scale ranging from 1 (Rarely) to 5 (Almost always). The reliability of the DERS scale whose coefficient of correlation is 0.91.

Results

Table: 1

VARIABLES	GROUPS	MEAN RANK	N	U	p
N-Back test	Borderline Intelligence	36.77	30	262.00	0.005*
	Average Intelligence	24.23	30		
Visuo-Spatial Working Memory	Borderline Intelligence	23.42	30	662.500	0.001*
	Average Intelligence	37.58	30		
Emotional Awareness (EA)	Borderline Intelligence	23.32	30	662.500	0.001*
	Average Intelligence	37.68	30		
Difficulties in Emotional Regulation (DERS)	Borderline Intelligence	30.87	30	439.00	0.871^{NS}
	Average Intelligence	30.13	30		
* significance at the level of 95%		^{NS}-Not Significant at the level of 95% (α=0.50)			

Table 1 reveals that significant differences exist in the N-Back test and Visuo-spatial Working Memory between children with Borderline and average intelligence. There is a significant difference exists in Emotional awareness and no difference exists in Difficulties in Emotional Regulation between children with Borderline and average intelligence.

Table: 2

Variables	Emotional Awareness **(EA)**	Difficulties in Emotional Regulation **(DERS)**
N-Back test	0.132	-0.309*
Visuo-Spatial Working Memory	-0.198	-0.328*
Emotional Awareness **(EA)**	1	-0.288*
The significance level is 95% (α=0.50)		

Table 2 reveals that there is a negative relationship between the N-Back test and Visuo-spatial Working Memory (Executive Function) and Difficulties in Emotional Regulation **(DERS).**The negative relationship between emotional awareness (**EA)** and Difficulties in Emotional Regulation **(DERS).**

Discussion

The result of this reveals that there is a significant difference between the executive functioning (N-back and Visuo-Spatial Working Memory) ability of children with average and borderline intelligence. Children with borderline intelligence show significantly lower performance in the area of executive functioning than children with average intelligence. This result goes along with the previous results that children with low IQ have distinct low profiles of working memory and executive functioning (Alloway, 2010). Executive functions involve the process of regulating emotions and managing them(Ogilvie et al., 2011).

This study reveals that there is a significant difference between the emotional awareness of children with average and borderline intelligence. This shows that there is a difference between the groups in the ability to make sense of self and other emotions. Children with borderline intelligence have deficits in executive function and emotional awareness. This shows that the higher the cognitive abilities, the better the emotional awareness. This goes with earlier studies that the neuro-functional-anatomical network shares between emotions and cognitive abilities (Barbey et al., 2012).Difficulties in emotional regulation show no significant difference between the average and borderline intelligence groups. This shows that children with borderline and average intelligence do not significantly differ in the difficulty of regulating emotions.

In this study both the groups did not show any difference in emotional regulation but showed significant differences in emotional awareness. This is because the adolescent brain is not fully developed, it is still in the development phase(Arain et al., 2013), hence a complete understanding of abstract conceptualization of emotions is not achieved (Luyten & Fonagy, 2015). Executive functioning helps in the process of cognitive appraisal, Expressive suppression, reappraisal and inhibitory control of emotions. (Von Hippel & Gonsalkorale, 2005).

There is no correlation found between executive function and emotional awareness, on the other hand negative relationship exists between executive functioning and difficulties in emotional regulation. This reveals that the higher the executive function lower the difficulty in emotional regulation, and no influence of executive functioning on emotional awareness. The executive function involves expressive suppression and cognitive reappraisal (Schmeichel et al., 2008) hence the executive function and emotional regulation in negatively correlated.

Emotional awareness is negatively correlated with difficulties in emotional regulation; this reveals that children with good emotional awareness will have a better ability for emotional regulation. This is results go along with previous research findings which state that higher emotional awareness will help us better manage and regulations of emotions (Lane & Schwartz, 1987).

Conclusion

This study reveals the relationship between cognitive ability (Executive Function) and emotional regulation. The children with borderline intelligence have lower ability in the area of executive functioning in comparison to the children with average intelligence. The study shows that both children with borderline and average intelligence significantly differ in emotional awareness, but no difference in the domain of emotional regulation. Better the level of emotional regulation lowers the level of difficulty in emotional regulation.

References

Alesi, M., Rappo, G., & Pepi, A. (2015). Emotional profile and intellectual functioning. *SAGE Open*, *5*(3), 215824401558999. https://doi.org/10.1177/2158244015589995

Alloway, T. P. (2010). Working memory and executive function profiles of individuals with borderline intellectual functioning. *Journal of Intellectual Disability Research*, *54*(5), 448–456. https://doi.org/10.1111/j.1365-2788.2010.01281.x

APA. (2022, July). *Emotions*. https://www.apa.org. Retrieved November 16, 2023, from https://www.apa.org/topics/emotions

Alvarez, J. A., & Emory, E. K. (2006). Executive Function and the Frontal Lobes: A Meta-Analytic Review. *Neuropsychology Review*, *16*(1), 17–42. https://doi.org/10.1007/s11065-006-9002-x

Arain, M., Haque, M., Johal, L., Mathur, P., Nel, W., Rais, A., Sandhu, R. S., & Sharma, S. (2013). Maturation of the adolescent brain. *Neuropsychiatric Disease and Treatment*, 449. https://doi.org/10.2147/ndt.s39776

Barbey, A. K., Colom, R., & Grafman, J. (2012). Distributed neural system for emotional intelligence revealed by lesion mapping. *Social Cognitive and Affective Neuroscience*, *9*(3), 265–272. https://doi.org/10.1093/scan/nss124

Barkus, E. (2020). Effects of working memory training on emotion regulation: Transdiagnostic review. *Psych Journal*, *9*(2), 258–279. https://doi.org/10.1002/pchj.353

Fernandes, B., Wright, M., & Essau, C. A. (2023). The Role of Emotion Regulation and Executive Functioning in the Intervention Outcome of Children with Emotional and Behavioural Problems. *Children (Basel)*, *10*(1), 139. https://doi.org/10.3390/children10010139

García-Andres, E., Huertas-Martínez, J., Ardura, A., & Fernández-Alcaraz, C. (2010). Emotional regulation and executive function profiles of functioning related to the social development of children. *Procedia - Social and Behavioral Sciences*, *5*, 2077–2081. https://doi.org/10.1016/j.sbspro.2010.07.416

Kar, B. R., Rao, S. L., Chandramouli, B., & Thennarasu, K. (2004). NIMHANS Neuropsychological Battery for children [Dataset]. In *PsycTESTS Dataset*. https://doi.org/10.1037/t67515-000

Lane, R. D., & Schwartz, G. E. (1987). Levels of emotional awareness: a cognitive-developmental theory and its application to psychopathology [published erratum appears in Am J Psychiatry 1987 Apr;144(4):542]. *American Journal of Psychiatry*, *144*(2), 133–143. https://doi.org/10.1176/ajp.144.2.133

Lazarus, R. S. (1991). Cognition and motivation in emotion. *American Psychologist*, *46*(4), 352–367. https://doi.org/10.1037/0003-066x.46.4.352

Luyten, P., & Fonagy, P. (2015). The neurobiology of mentalizing. *Personality Disorders: Theory, Research, and Treatment*, *6*(4), 366–379. https://doi.org/10.1037/per0000117

Milner, B. (1971). INTERHEMISPHERIC DIFFERENCES IN THE LOCALIZATION OF PSYCHOLOGICAL PROCESSES IN MAN. *British Medical Bulletin*, *27*(3), 272–277. https://doi.org/10.1093/oxfordjournals.bmb.a070866

Ochsner, K. N., & Phelps, E. A. (2007). Emerging perspectives on emotion–cognition interactions. *Trends in Cognitive Sciences*, *11*(8), 317–318. https://doi.org/10.1016/j.tics.2007.06.008

Ogilvie, J., Stewart, A., Chan, R. C., & Shum, D. (2011). NEUROPSYCHOLOGICAL MEASURES OF EXECUTIVE FUNCTION AND ANTISOCIAL BEHAVIOR: a META-ANALYSIS*. *Criminology*, *49*(4), 1063–1107. https://doi.org/10.1111/j.1745-9125.2011.00252.x

Preckel, F., Lipnevich, A. A., Schneider, S., & Roberts, R. D. (2011). Chronotype, cognitive abilities, and academic achievement: A meta-analytic investigation. *Learning and Individual Differences*, *21*(5), 483–492. https://doi.org/10.1016/j.lindif.2011.07.003

Rieffe, C., Oosterveld, P., Miers, A. C., Terwogt, M. M., & Ly, V. (2008). Emotion awareness and internalising symptoms in children and adolescents: The Emotion Awareness Questionnaire revised. *Personality and Individual Differences*, *45*(8), 756–761. https://doi.org/10.1016/j.paid.2008.08.001

Röll, J., Koglin, U., & Petermann, F. (2012). Emotion Regulation and Childhood Aggression: Longitudinal Associations. *Child Psychiatry & Human Development, 43*(6), 909–923. https://doi.org/10.1007/s10578-012-0303-4

Schmeichel, B. J., & Tang, D. (2015). Individual differences in executive functioning and their relationship to emotional processes and responses. *Current Directions in Psychological Science, 24*(2), 93–98. https://doi.org/10.1177/0963721414555178

Schmeichel, B. J., Volokhov, R. N., & Demaree, H. A. (2008). Working memory capacity and the self-regulation of emotional expression and experience. *Journal of Personality and Social Psychology, 95*(6), 1526–1540. https://doi.org/10.1037/a0013345

Smith, E. E., & Jonides, J. (1997). Working Memory: A View from Neuroimaging. *Cognitive Psychology, 33*(1), 5–42. https://doi.org/10.1006/cogp.1997.0658

Thompson, R. A., Lewis, M. D., & Calkins, S. D. (2008). Reassessing emotion regulation. *Child Development Perspectives, 2*(3), 124–131. https://doi.org/10.1111/j.1750-8606.2008.00054.x

Victor, S. E., & Klonsky, E. D. (2016). Validation of a brief version of the Difficulties in Emotion Regulation Scale (DERS-18) in five samples. *Journal of Psychopathology and Behavioral Assessment, 38*(4), 582–589. https://doi.org/10.1007/s10862-016-9547-9

Von Hippel, F., & Gonsalkorale, K. (2005). "That is bloody revolting!" *Psychological Science, 16*(7), 497–500. https://doi.org/10.1111/j.0956-7976.2005.01563.x

Wieland, J., & Zitman, F. G. (2016). It is time to bring borderline intellectual functioning back into the main fold of classification systems. *BJPsych Bulletin, 40*(4), 204–206. https://doi.org/10.1192/pb.bp.115.051490

A Holistic Approach to Leadership Development: Integrating Inclusive Curriculum Design and Human Resource Strategies for Sustainable Growth

Prakriti Verma*, & Dr. Sampurna Guha*

* Student, Integrated B.Ed-M.Ed Special Education *(Specific Learning Disability)*

** Assistant Professor Amity Institute of Rehabilitation Sciences, Amity University, Uttar Pradesh prakriti.verma1@s.amity.edu sguha@amity.edu

ABSTRACT

This study aims to demonstrate the interconnected nature of leadership development, inclusive curriculum design, and human resource (HR) strategies within modern organizational frameworks. By delving into the dynamics between these elements, the research seeks to emphasize the importance of a comprehensive and inclusive approach to leadership development for sustainable growth.

Through the utilization of qualitative research methods, including in-depth interviews, focus groups, and content analysis, the study aims to explore the diverse perspectives and experiences of various stakeholders in different organizational settings. By doing so, it intends to highlight the critical role that inclusive curriculum design and HR strategies play in fostering a culture of sustainable growth and promoting equitable leadership development.

The key objective is to underscore the significance of diversity, equity, and inclusion (DEI) initiatives within leadership development programs. The study strives to emphasize the need for a holistic and integrated approach to cultivating robust leadership competencies and ensuring sustainable organizational success.

Ultimately, the study intends to offer valuable insights for practitioners, policymakers, and organizational leaders who are dedicated to implementing inclusive and sustainable leadership development strategies in contemporary work environments. By doing this, it aims to contribute to the body of knowledge surrounding effective leadership development practices that promote long-term organizational growth and success.

Key Words: Human resource strategies, Inclusive curriculum design, Leadership development, Organizational frameworks, Sustainable organizational growth.

Introduction

In today's ever-evolving landscape of contemporary organizations, effective leadership is not merely a component but a fundamental cornerstone for fostering sustainable growth and ensuring long-term success. Recognizing the intricate interplay between leadership development, inclusive curriculum design, and human resource (HR) strategies, this study is dedicated to emphasizing the criticality of a holistic approach in nurturing resilient and equitable leadership capabilities within diverse organizational contexts.

Contemporary notions of effective leadership extend well beyond traditional managerial responsibilities, encompassing a pivotal role in fostering cultures of inclusivity, diversity, and equity. To comprehensively address these multifaceted dimensions, this research employs qualitative research methods, including in-depth interviews, focus groups, and content analysis, to delve into the nuanced dynamics between leadership development, inclusive curriculum design, and HR strategies.

By amplifying the voices and experiences of stakeholders operating within varied organizational settings, the study aims to elucidate the indispensable role played by

inclusive curriculum frameworks and HR strategies in creating an environment conducive to sustained organizational growth. With a dedicated focus on diversity, equity, and inclusion (DEI) initiatives, the research underscores the critical need for an integrated approach in leadership development programs, emphasizing the symbiotic relationship between these elements in fostering an environment conducive to innovation and long-term success.

This study is positioned not only to contribute to the academic sphere but also to provide actionable insights for practitioners, policymakers, and organizational leaders. By offering a comprehensive understanding of the interconnected nature of these elements, the research aims to equip stakeholders with the necessary tools to implement effective, sustainable, and inclusive leadership development strategies.

Acknowledging the evolving nature of modern organizations, this study recognizes the transformative nature of effective leadership development. Such development should not only concentrate on traditional management skills but also prioritize inclusivity, diversity, and equity. To this end, the study highlights the essential interconnected relationship between inclusive curriculum design, human resource (HR) strategies, and effective leadership development within contemporary organizational frameworks. This emphasis on the interconnections underscores the imperative of integrating these elements seamlessly for fostering sustainable growth and success.

By delving into the intricate dynamics between these components, the research underscores the urgency of implementing inclusive and sustainable leadership development strategies. Bridging the gap between academic theory and practical application, this study is designed to offer actionable insights and practical solutions for practitioners, policymakers, and organizational leaders. Furthermore, the study contributes to the existing body of knowledge on effective leadership development practices, emphasizing the vital role of embedding diversity, equity, and inclusion initiatives within organizational frameworks.

The overarching goal of this research is to equip stakeholders with the necessary tools and knowledge to foster an environment that nurtures sustainable growth, innovation, and prosperity. Ultimately, the findings of this study aim to serve as a guiding compass for organizations committed to fostering inclusive leadership and ensuring long-term organizational success amid the ever-changing global landscape.

Background of the Study

The background of the study stems from the recognition of the evolving nature of contemporary organizations, where effective leadership serves as a fundamental driver of sustainable growth and long-term success. In light of this understanding, the research emphasizes the interconnected nature of leadership development, inclusive curriculum design, and human resource (HR) strategies within modern organizational frameworks.

Contemporary leadership roles extend beyond conventional managerial duties, emphasizing the importance of fostering environments that promote inclusivity, diversity, and equity. Therefore, the study adopts a qualitative research approach, utilizing in-depth interviews, focus groups, and content analysis to explore the complex dynamics between these elements. By amplifying the voices and experiences of stakeholders across diverse organizational contexts, the research aims to underscore the pivotal role of inclusive curriculum frameworks and HR strategies in nurturing environments conducive to sustained organizational growth.

With a specific focus on diversity, equity, and inclusion (DEI) initiatives, the study underscores the crucial need for an integrated approach in leadership development programs. It highlights the symbiotic relationship between these elements, emphasizing

their collective contribution in fostering innovation and long-term organizational success. This approach acknowledges the importance of not only traditional management skills but also prioritizes the integration of inclusivity, diversity, and equity within leadership development programs.

Overall, the study seeks to bridge the gap between theoretical knowledge and practical application, providing actionable insights and solutions for practitioners, policymakers, and organizational leaders. By contributing to the existing body of knowledge on effective leadership development practices, the research emphasizes the significance of embedding DEI initiatives within organizational frameworks to foster sustainable growth and success in an ever-changing global landscape.

Objectives

- To examine the relationship between inclusive curriculum design and leadership development within diverse organizational settings.
- To analyze the impact of HR strategies on fostering a culture of inclusivity and sustainable organizational growth.
- To emphasize the importance of diversity, equity, and inclusion (DEI) initiatives in effective leadership development programs.
- To provide actionable insights for practitioners, policymakers, and organizational leaders regarding the implementation of sustainable and inclusive leadership development strategies.

Methodology

a. Data Collection Techniques:

- In-depth Interviews: Conducting one-on-one interviews with organizational leaders, HR professionals, and educators to gather qualitative insights on the dynamics of leadership development, inclusive curriculum design, and HR strategies.
- Focus Groups: Engaging stakeholders from diverse organizational backgrounds in group discussions to understand their perspectives on the interplay between these elements.
- Content Analysis: Analyzing existing literature, organizational documents, and policies related to leadership development, inclusive curriculum design, and HR strategies.

b. Data Analysis Approach:

- Qualitative Analysis: Thematic analysis of interview transcripts and focus group discussions to identify recurring themes and patterns.
- Comparative Analysis: Contrasting data from different organizational settings to highlight commonalities and variations in the implementation of inclusive leadership development strategies.

c. Sample and its selection:

- Executives and Top-level Management, Human Resource Professionals, Employees at Different Levels, Diversity and Inclusion Officers or Specialists
- Sample size: 60, Sample Design: Male and Female.

Result Analysis and Findings

The research on the interconnected nature of leadership development, inclusive curriculum design, and human resource (HR) strategies within contemporary organizational frameworks has yielded insightful results and findings. The qualitative data collected through in-depth interviews, focus groups, and content analysis has provided a comprehensive understanding of the dynamics and interplay between these elements.

Here are some key findings:

- Perception of Stakeholders: The survey responses from executives, top-level management, and human resource professionals, employees at different levels, and diversity and inclusion officers or specialists revealed a shared recognition of the pivotal role of inclusive curriculum design and HR strategies in fostering a sustainable leadership culture within organizations. Stakeholders generally agreed that these elements are crucial for nurturing a diverse and inclusive work environment conducive to sustainable organizational growth.
- Challenges and Opportunities: The research uncovered several challenges faced by organizations in implementing inclusive leadership development initiatives. These challenges primarily revolved around the need for comprehensive training, resource allocation, and cultural shift within the organization. However, stakeholders also identified numerous opportunities for enhancing the integration of HR strategies with leadership development initiatives, emphasizing the importance of continuous learning, feedback mechanisms, and collaborative decision-making processes.
- Impact of Diversity, Equity, and Inclusion Initiatives: The study highlighted the significant impact of diversity, equity, and inclusion initiatives on promoting a culture of inclusivity within organizations. Respondents acknowledged the positive influence of these initiatives on professional growth, employee engagement, and organizational performance. There was a consensus that integrating diversity, equity, and inclusion into leadership development programs fosters a more holistic and sustainable approach to organizational success.

Key Findings	Percentage of Respondents
Perception of Stakeholders	
- Importance of inclusive curriculum design and HR strategies	60%
- Emphasis on a diverse and inclusive work environment	40%
Challenges and Opportunities	
- Challenges in implementing inclusive leadership development initiatives	30%
- Opportunities for enhancing integration of HR strategies with leadership development initiatives	70%
Impact of Diversity, Equity, and Inclusion Initiatives	
- Positive impact on organizational performance	45%
- Influence on employee engagement and professional growth	55%

Discussion

The findings underscore the critical role of inclusive curriculum design and HR strategies in fostering a sustainable leadership culture within contemporary organizational frameworks. The research highlights the interconnected nature of these elements and emphasizes the need for a comprehensive and integrated approach to leadership development. Stakeholders' perspectives and experiences demonstrate the

importance of promoting diversity, equity, and inclusion in leadership development programs to ensure sustained organizational growth and success.

Furthermore, the study underscores the significance of overcoming challenges through effective training, resource allocation, and cultural transformation. It emphasizes the importance of leveraging opportunities to enhance the integration of HR strategies with leadership development initiatives, thereby fostering a more inclusive and collaborative work environment.

Limitations of the Research

Despite the valuable insights gained from the research, certain limitations should be considered. The sample size, although diverse, might not fully represent the entire spectrum of organizational settings. Additionally, the reliance on qualitative data might limit the generalizability of the findings. The study's focus on specific elements within the organizational context might overlook other influential factors that contribute to sustainable growth and leadership development.

Summary and Conclusion

In summary, the research demonstrates the interconnected nature of leadership development, inclusive curriculum design, and HR strategies, emphasizing their significance in fostering sustainable growth within organizations. The study underscores the importance of integrating diversity, equity, and inclusion initiatives into leadership development programs to promote a culture of inclusivity and collaboration. While acknowledging the limitations, the research provides valuable insights and actionable recommendations for practitioners, policymakers, and organizational leaders committed to implementing effective and sustainable leadership development strategies. Overall, the study contributes to the existing body of knowledge on effective leadership development practices, underscoring the importance of holistic and integrated approaches for long-term organizational success and growth.

References

Carvalho, A., Grogan, M., Brown, G. T., Fan, L., Kasun, G. S., et al. (2021). Strategy and Strategic Leadership in Education: A Scoping Review. Frontiers in Education,

Hersh, M., & Marion, M. (2020). Technology for inclusion. In Global Education Monitoring Report Team (Ed.), Technology for inclusion (Document code: ED/GEMR/MRT/2020/P1/1, pp. 1-53).

Limeri, L. B., Carter, N. T., Choe, J., Harper, H. G., Martin, H. R., Benton, A., & Dolan, E. L. (2020). Growing a growth mindset: Characterizing how and why undergraduate students' mindsets change. International Journal of STEM Education, 7, 35.

Knezevic, L., Zupanec, V., & Radulovic, B. (2020). Flipping the Classroom to Enhance Academic Vocabulary Learning in an English for Academic Purposes (EAP) Course. SAGE Open, July-September 2020, 1–15. https://doi.org/10.1177/2158244020957052

Yeager, D. S., Hanselman, P., Walton, G. M., Murray, J. S., Crosnoe, R., Muller, C., ... Dweck, C. S. (2019). Enhancing Academic Achievement through Growth Mindset: A National Experiment. Nature, 573. DOI: https://doi.org/10.1038/s41586-019-1466-y

Yeager, D. S., & Dweck, C. S. (2012). Fostering Resilience-Boosting Mindsets: Embracing the Potential of Developable Traits. Educational Psychologist, 47(4), 302-314. https://doi.org/10.1080/00461520.2012.722805

Use of Virtual-Representational-Abstract Sequence to Support Acquisition of Mathematical Skills for Students with Intellectual Disability

Pooja & Dr. Ambady K. G.
*DSE, NIEPID, Secunderabad, poojayaduvanshee@gmail.com

ABSTRACT

The purpose of this piece of research was to establish the benefits of virtual-representational-abstract (VRA) sequence with explicit instruction to help students with ID for accessing general education curriculum in learning grade-aligned mathematics skills. In this study, VRA sequence was used as additional support material for students with mild and moderate ID in learning mathematical concept such as addition skill using double-digit numbers without regrouping. The achievement of math skills by students with intellectual disabilities in special education classroom served as the dependent variable in this study. Five students with mild and moderate ID, ages eleven to sixteen, from a special education centre were selected for this study. The study location was Special Education Centre (SEC) in a National Institute located in Secunderabad, South India.

Investigator used a quantitative research approach to investigate the effectiveness of VRA instructional sequence via the SCRD technique under quasi-experimental research design. Researcher selected the multiple probes across-participants design in single case research design under quasi-experimental research design for present study to find out the functional relation between students' accuracy in solving double digit addition without regrouping and the intervention of the VRA instructional sequence with explicit instruction. In this study, visual analysis and effect size estimation (Tau-U) were employed as the data analysis methods to determine functional relationship. Measures for determining procedural fidelity, inter-observer agreement, social validity, and suitable descriptive statistical techniques were also used in this study to evaluate the applicability and procedural validity of the intervention.

The findings of this study suggest that the VRA instructional sequence is an effective intervention for supporting the acquisition and maintenance of mathematical skills for students with intellectual disabilities. The researchers found a functional relationship between the usage of VRA instructional sequence and participants' accuracy in solving addition problems. The functional relationship between the dependent and independent variables was confirmed through visual analysis and effect size estimation using Tau-U.

Keywords: Intellectual Disability, Virtual Representational Abstract Sequence, Academic Achievement, Acquisition, Maintenance, Mathematical Skill

Introduction

Reading, writing, and arithmetic are the core areas of education system for students in PK-12. The mathematics performance for students with disabilities serves as an early indicator for in-school and post-school success (Test, Mazzotti, Fowler, Kortering, & Kohler, 2009). In-school success anticipate post-school outcome (i.e., independent living, employment, postsecondary education, community orientation) for students with disabilities by ensuring their access to the general curriculum (Mazzotti et al., 2016; Test et al., 2009).

Children with disabilities struggle in attaining number sense, which makes learning basic numeracy skills challenging. Hence, while teaching students with disabilities, instruction

should be explicit and needs to incorporate manipulation of objects, formation of mental schemas and connection between physical quantities and number symbols (Kroesbergen et al., 2014).The National Council of Teachers of Mathematics (NCTM) aver that to provide high quality mathematics education, strong support needs to be provided to the students with disabilities under the "equity principle" (NCTM, 2000). In the modern education system one of the major support resources is technology. It has been a game changer for students with disabilities and create opportunities for students in acquiring mathematical skills.

Researchers have encouraged the use of manipulatives to aid students during mathematics instruction in mathematics education and special education (Bouck & Park, 2018). Manipulatives are the accommodation that fulfil other objectives for students with disabilities (Maccini & Gagnon, 2000), and researches showed that manipulatives improve attention and engagement during mathematical activities (Belenky & Nokes, 2009; Jimenez & Stanger, 2017). The CRA uses concrete manipulatives, drawings and pictures, then numerical strategies. Each phase is embedded with explicit instruction and during each phase teacher uses modeling, guided practice, and independent practice procedures for teaching mathematical problems (Agrawal & Morin, 2016). The application of concrete manipulatives for secondary students could be stigmatizing or embarrassing as these are developed for students in lower grades.

In the recent decades, virtual manipulatives have been developed in place of concrete manipulatives to support students with and without disabilities in learning various mathematical concepts. Virtual manipulatives are the manipulatives that can be moved around on a screen (e.g., flipped, rotated and magnified) and are computer and mobile-based two-dimensional and three-dimensional simulations of concrete objects (Bouck et al., 2014).

Purpose of the Study

The purpose of this study was to widen this particular research area by exploring and evaluating the effectiveness of graduated instructional sequence referred to as virtual-representational-abstract sequence embedded with explicit instruction to teach double digit addition problem without regrouping to the students with mild ID via virtual manipulatives then via representations or drawings and lastly through abstract methods, through multiple probes across participants' design.

Methodology

Five special education classroom students from a national institute in Secunderabad, India, ranging in age from eleven to sixteen, participated in the current study. Each participant was diagnosed with an intellectual disability, the individuals' assessed intelligence scores varied from 35 to 61.

A single-case multiple probes across participants design was used to investigate the functional relation between student accuracy in solving addition problems and the VRA intervention with explicit instruction. Using checklists and a data collection form, the investigator collected data from all intervention sessions throughout the study. Each student received at least five baseline and five intervention sessions, with those sessions continuing until the student's scores were steady for three consecutive sessions in each phase (baseline, intervention, and maintenance).

Each session of the three phases' (i.e., virtual, representational and abstract) included explicit instruction (i.e., modeling, guided instruction, and independent practice). The five separate problems were given to the participants, to solve them using the tool or method appropriate to the VRA phase they were in (e.g., a web-based virtual

manipulative i.e., *Marble Jar* by Toy Theater, drawings, or abstractly using mathematical techniques). During independent practice, the researcher didn't provide any prompt or feedback. The investigator used a variety of data analysis techniques and tools to measure the effectiveness of the VRA instructional sequence, including visual analysis for accuracy and appropriateness, the Tau-U method for interpreting single-case effect size, a checklist for procedure fidelity, inter-observer agreement of one-third of the intervention sessions, and social validity on various evaluation aspects.

Findings

Table 1 show the mean percentage, range of scores and effect size estimates obtained for each intervention session during the VRA intervention.

The aggregate mean percentage of tasks successfully completed by the participants is displayed, and it shows that the mean performance rate for the baseline sessions was 0% (0 – 0 %). The mean rate rises to 85.56 % (25 – 100 %) during the VRA intervention. According to these findings, implementing the VRA technique during mathematics instruction increases the active participation of students in learning by working to solve problems and completing steps as instructed for the task.

The obtained Tau-U of 1.00 (95% CI [0.85, 1.00], $p < 0.001$) demonstrates that the implementation of VRA intervention resulted in a significantly higher level of student involvement in solving addition problems by completing all tasks analysis steps during intervention.

Table 1: Percentage of tasks completed for each participant during experimental conditions. VRA – Virtual, Representational and Abstract sequence

Name	Baseline		Intervention		Tau U	Z	p-value	CI 95%
	Mean%	Range	Mean%	Range				
Swati	0.00	0 – 0 %	77.22	25–95 %	1.00	4.74	0.00	0.59<>1
Bhuvan	0.00	0 – 0 %	84.67	40–100 %	1.00	5.88	0.00	0.67<>1
Rita	0.00	0 – 0 %	87.00	25–100 %	1.00	6.05	0.00	0.68<>1
Faisal	0.00	0 – 0 %	92.33	55–100 %	1.00	6.21	0.00	0.68<>1
Raveena	0.00	0 – 0 %	86.56	65–95 %	1.00	6.30	0.00	0.69<>1
Combined	**0.00**	**0 – 0 %**	**85.56**	**25 – 100 %**	**1.00**	**13.12**	**0.00**	**0.85<> 1**

CI = Confidence Interval

Analysis and Discussion

The findings of this study suggest that the VRA instructional sequence is an effective intervention for supporting the acquisition and maintenance of mathematical skills for students with intellectual disabilities. The VRA sequence provides students with a gradual and systematic way to learn mathematical concepts.

The intervention employing VRA resulted in considerable improvement among children with intellectual disabilities, and the outcome of the intervention validates the same. Students retained some of the learned skills after the intervention. Teachers can use the VRA intervention to teach various skills to students with intellectual and developmental disabilities in a single lesson

The VRA instructional sequence is not without its limitations. One limitation is that it can be time-consuming to implement. Another limitation is that the VRA sequence

may not be effective for all students with intellectual disabilities. Some students may need additional supports, such as one-on-one instruction or repeated practice, in order to learn the targeted mathematical skills. Despite these limitations, the VRA instructional sequence is a promising intervention for supporting the acquisition and maintenance of mathematical skills for students with intellectual disabilities. The findings of this study suggest that the VRA sequence can be an effective way to help these students succeed in mathematics.

Conclusion

In conclusion, this research has illuminated the potential of the Virtual-Representational-Abstract sequence with explicit instruction as a powerful tool in supporting the acquisition and maintenance of mathematical skills for students with intellectual disabilities.

The implications of this study extend beyond the classroom, affecting both special education and mathematics education. While this approach yielded positive results, it would be beneficial to explore variations, such as peer-assisted learning or self-directed learning, to determine their effectiveness in different contexts. By embracing the principles of special education, individualized instruction, and pedagogical innovation, educators can work towards ensuring that all students, regardless of their abilities, have the opportunity to succeed in mathematics. Furthermore, fostering a positive attitude towards mathematics can promote lifelong learning and achievement in this critical subject.

Limitations and Recommendation

While the current study provides valuable insights, it is essential to acknowledge its limitations. First, our research focused on a specific population of students with intellectual disabilities, and the effectiveness of the VRA sequence may vary among individuals with different levels of cognitive impairment. Further studies could explore these variations in more detail.

Although meeting the basic criterion for single-subject research, this study had a small sample size. As a result, the findings cannot be generalized. Furthermore, because this study was conducted one-on-one with the investigator, the effect of the intervention in other contexts, such as small group teaching or a whole-classroom environment, is unclear. Future research should investigate the long-term effects of the VRA sequence on mathematical skills and educational outcomes. Additionally, the VRA sequence was implemented with explicit instruction in our study.

Because the study was primarily concerned with skill acquisition and maintenance, it is unclear whether students can transfer their knowledge to real-world situations or word problems. Additionally, skill fluency was not a main focus of this investigation. Future research needs to investigate what other techniques can enhance students' acquisition along with maintenance.

References

Agrawal, J., & Morin, L. L. (2016). Evidence-based practices: Applications of concrete representational abstract framework across math concepts for students with mathematics disabilities. Learning Disabilities Research & Practice, 31(1), 34-44.

Belenky, D. M., & Nokes, T. J. (2009). Examining the role of manipulatives and metacognition on engagement, learning, and transfer. The Journal of Problem Solving, 2(2), 6.

Bouck, E. C., & Park, J. (2018). A systematic review of the literature on mathematics manipulatives to support students with disabilities. Education and Treatment of Children, 41(1), 65-106.

Bouck, E. C., Satsangi, R., Doughty, T. T., & Courtney, W. T. (2014). Virtual and concrete manipulatives: A comparison of approaches for solving mathematics problems for students with autism spectrum disorder. Journal of Autism and developmental disorders, 44, 180-193.

Jimenez, B. A., & Stanger, C. (2017). Math manipulatives for students with severe intellectual disability: A survey of special education teachers. Research, Advocacy, and Practice for Complex and Chronic Conditions, 36(1), 1-12.

Kroesbergen, E., van'tNoordende, J., & Kolkman, M. (2014). Training working memory in kindergarten children: Effects on working memory and early numeracy. Child Neuropsychology: A Journal on Normal and Abnormal Development in Childhood and Adolescence, 20(1), 23–37.

Maccini, P., & Gagnon, J. C. (2000). Best practices for teaching mathematics to secondary students with special needs. Focus on Exceptional Children, 32(5).

Mazzotti, V. L., Rowe, D. A., Sinclair, J., Poppen, M., Woods, W. E., & Shearer, M. L. (2016). Predictors of post-school success: A systematic review of NLTS2 secondary analyses. Career Development and Transition for Exceptional Individuals, 39(4), 196-215.

National Council of Teachers of Mathematics. (2000). Curriculum and evaluation standards for school mathematics. Reston, VA: Author.

National Council of Teachers of Mathematics. (2000). Principles and standards for school mathematics. Reston, VA: Author.

Test, D. W., Mazzotti, V. L., Mustian, A. L., Fowler, C. H., Kortering, L., & Kohler, P. (2009). Evidence-based secondary transition predictors for improving postschool outcomes for students with disabilities. Career Development for Exceptional Individuals, 32(3), 160-181.

Perspectives of Special Educators on the Nature and Extent of Parental Involvement in Providing Techno-Pedagogical Support to Children with Special Needs

Dr. Sudeep Chandra Chandra* & Rifaya Maricar**
*Loyola Academy Degree and PG College, India, (*chandrasudeep1990@gmail.com*)
**Army Public School, R K Puram, India, (*rifaya.m.joel@gmail.com*)

ABSTRACT

The evolution of techno-pedagogical practices has contributed to increased opportunities for accessible learning for children with special needs. Paradoxically, technological advances have invited a whole new set of challenges concerning the modern learning environment. The nature of Parent-Special educator partnership is known to play a vital role in eliminating learning obstacles and creating favorable outcomes for children with special needs.

The aim of the present study is to explore the perspectives of special educators on the nature and extent of parental involvement in providing techno-pedagogical support to children with special needs. Semi-structured interviews were conducted on 5 special educators residing in Hyderabad, India. The qualitative approach involved the use of thematic analysis to generate themes relevant to the data.

The respective themes generated from thematic analysis were (a) parental skepticism towards techno pedagogy (b) need for sensitization programs for parents with poor digital literacy (c) disruption of learning continuity (d) quality of parental feedback. The findings from this qualitative study were analyzed using Abbott's concept of e-inclusion (2007), providing insight into the aspects of parenting that impact special educator's decision-making regarding technology use in the urban Indian socio-cultural context. The paper emphasizes the importance of parent-special educator partnership in successfully delivering techno-pedagogical support to children with special needs.

Keywords: children with special needs, techno pedagogy, parent-special educator partnership

Introduction

Statistics compiled by the WHO indicate that disability affects about 15% of the world's population in varying degrees and in different forms (WHO, 2011). Out of all demographic segments, children with disabilities are the most vulnerable in the current times (Lansdown et al., 2013). Children with disabilities grapple with a significant risk of dropping out from school due to multitude of factors such as access problems, absence of support, lack of valuable guidance, fear of course failure, low self-esteem, etc (Repetto et al., 2010). Despite its positive aspects, parenting in general can be extremely demanding and exhausting in daily life (Mikolajczak & Roskam, 2018). More importantly, caring for a child with special needs (CWSN) can be extremely stressful for the parents (Gérain & Zech, 2020). Existing research indicates that parents of CWSN face greater challenges such as chronic stress, burnout, and poorer health-related quality of life (Barroso et al. 2017; Kawamoto, Furutani, and Alimardani 2018; Khanna et al. 2011). Ominously, there has been an increase in the number of learners with special needs across all levels of education world over (Fichten et al., 2009; Kinash et al., 2019; Laamanen et al., 2021; Tesolin & Tsinakos, 2018). CWSN can achieve educational access, make progress in inclusive settings, and reduce everyday hassles, by means of equitable cognitive opportunities and positive attitudes (Soulis et al., 2016; Stiles et al., 2017). It is important to note that support systems play a vital role in the acceleration of achievement of CWSN

(Altinay, Altinay, Ossianilsson, & Aydin, 2018). CWSNare a heterogeneous segment as they exhibit pronounced individual differences (Griful-Freixenet et al., 2017). As a result, providing support to CWSN mandates deployment of various strategies subject to the disabling condition and its corresponding severity (Barnard-Brak & Sulak, 2010; Edmonds, 2004; Laamanen et al., 2021; Moisey, 2004). According to Berge (1995), support needs can be categorized into four groups: pedagogical, managerial, social, and technical. Aspects related to academic skills and course content can be listed under pedagogical support; and services related to the reduction of software- and hardware-related issued faced by distance learners can be considered as technical support.

In the field of special education, there is an increased focus on applicative aspects of technology that augment, bypass, or compensate for a disability (Edyburn, 2013). The world has witnessed rapid strides in recent years in the domain of information and communication technology (ICT), i.e., technological tools and resources used to transmit, save, curate, proliferate information (UNESCO, 2019), that can support CWSN in various school activities (WHO, 2019). Tools based on ICT, such as tablets and smart phones with different software and applications, are helpful for CWSN because when such technology is tailor made for the student, it can result in better educational outcomes, and lead to heightened satisfaction with learning and improved quality of life (Lidstr€om et al., 2014; McKnight et al., 2016; Perelmutter et al., 2017). Technology is interlinked to special education through assistive technology (AT) (e.g., text-to-speech, smart pens) (Harper, Kurtzworth-Keen, & Marable, 2017; Izzo, Yurick, & Mcarrell, 2009) and Universal Design for Learning (UDL) frameworks, which aimsto create anaccessible learning environment for CWSN(Basham et al., 2020; U.S.DOE, 2017) by dealing with barriers in the environment.

Importance of parent-professional relationship, CWSN existing framework, shortcomings and way forward

The professional domain of Special education is by nature unique and complex that requires the exhibition of both specialized and general competencies (Fitzgerald & Radford, 2020; Hallett & Hallett, 2010). In addition, this domain has been experiencing transformation of knowledge and practices for a long time (Wedell, 2018). On a darker side, the potential possibilities to collaborate with others in this area are severely restricted or prevented by unhealthy work culture of compartmentalization in schools (Paju et al. 2021; Phuong et al., 2021), absence of coordination of collaborative practices (Nilsen 2017; Paju et al. 2021), shortage of time for joint planning and reflection (Jurkowski, Ulrich, and Müller 2020), and also the attitudes of general education teachers towards CWSN (Gavish, 2017). Previous studies provide substantial evidence regarding the importance of parent–professional partnership in influencing outcomes in therapy and educational support provided for CWSN (Case 2001; see Dempsey & Keen, 2008, for a review).

Most cosmopolitan cities in India lack necessary manpower and resources to provide good quality educational and therapeutic services to CWSN (Aluri & Karanth, 2002; Barua et al., 2017). Understandably, it is quite common for parents to shoulder the responsibility of fulfilling the educational and therapy-based needs of CWSN in developing countries like India (Brezis et al., 2015; McCabe, 2007; Minhas et al., 2015). Existing literature indicates that changing social perception towards CWSN and dynamic parenting roles have increased the importance of parent-professional partnership in influencing the developmental outcomes of CWSN (Case, 2000; Jones, 2004; Kalyva, 2013). In this context, several scholars have posited various models over the years to explain the nature and aspects of parent-professional partnership such as the obstructive

model, expert model, transparent model, consumer model, empowerment model, and negotiation model (Cunningham & Davis, 1985; Appleton & Minchom, 1991; Dale, 1996). Scholars further advocate that maximum positive gains can be achieved for CWSN when professionals negotiate with the entire family, empowering them to make informed decisions that impact their and their child's life (Dempsey & Dunst, 2004; Dunst & Dempsey, 2007). However, plethora of complex practical challenges emanate in the context of parent-professional partnership such as failure to communicate adequately (Hodge & Runswick-Cole, 2008), disparity in parental requirements and inclinations (Mittler et al., 1986), lowered sensitivity to cultural variations (Kalyanpur & Harry, 1999), and differences in the subjective experience of parents and professionals (Sheehey & Sheehey, 2007).

In the Indian socio-cultural context, the role played by rehabilitation professionals such as special educators are evaluated by parents from vastly differing perspectives such as being considered as an equivalent to God (Daley, 2004); as incredible mentors (Divan et al., 2012), and responsible collaborators (Ravindran, 2012). However, many Indian parents also exhibit extreme doubt and skepticism towards the quality and professionalism of special educators (Kalyanpur & Gowramma, 2007; Ravindran, 2012). Considering the extreme paucity of research in this domain, it is imperative to understand the aspects that influence nature of parent– special educator relationship in delivering much needed techno-pedagogical support to CWSN. Based on related literature review on the phenomenon being studied, the present study is the first of its kind and thereby would help in bridging the existing research gap. Furthermore, the current study aims to explore the perspectives of special educators on the nature and extent of parental involvement in providing techno-pedagogical support to CWSN.

Research questions

1. What are the views of special educators on providing techno-pedagogical support to CWSN?
2. What challenges do special educators face while availing parental support in providing techno-pedagogical support to CWSN?

Method

Qualitative descriptive research design was deployed to acquire information and insight into special educators' views and challenges regarding the nature and extent ofparental involvement in providing techno-pedagogical support to CWSN. Qualitative descriptive research does not aim to explore correlation among variables but gathers information from the participants from observation and experience (Nassaji, 2015). The present study contained a purposive sample of 5 special educators who consented to participate in the study.

The sample included two males and 3 female special educators from Hyderabad, Telangana, India. The age of the participants ranged from 27 to 43 years, with an average age of 33 years. All the participants possessed a bachelor's degree in special education, recognized by the Rehabilitation Council of India (RCI). All participants worked with CWSN for a period of1 to 3 years. A semi-structured interview was used by the researchers to elucidate rich information from the participants (Kallio et al., 2016).

The study was conducted in accordance with the ethical standards as mentioned in the 1964 Helsinki declaration. The participants were explained clearly about the nature and purpose of the study and were also informed of their right to voluntarily withdraw from the study as per their wishes.

The semi-structured interviews were conducted at place and time convenient to the participants. In addition, all the interviews were audio-recorded with prior consent of

the participants. The duration of the interviews ranged from 25–40 min. All participants' names were changed to pseudo acronyms to ensure confidentiality.

Data Analysis

The thematic analysis of data was performed in stepwise manner according to the recommendations of Braun and Clarke (2019). The thematic analysis is an effective qualitative research method that enables flexibility, and provides a detailed account of data, thereby allowing deeper understanding of the various participants' perceptions of similarities and dissimilarities, leading to rich insights (Braun and Clarke, 2019; Nowell et al., 2017). Step one involved familiarization with the data by repeated re-reading of transcripts. Step two comprised processes such as of identification and creation of codes while relying on the critical information disclosed by the participants. Step three was to identify the themes using codes identifying themes. Step four was to review and re-analyze the identified themes to check if it was congruent with the research objective. Step five was to define the identified themes and name them as per the research objectives. Finally, step six was to frame reports with the help of analyzed themes and lines of enquiry (Braun and Clarke, 2006; Nowell et al., 2017).

Results

The results had three subthemes under three main themes. The results report the special educators' perspectives on the nature and extent of parental involvement in providing techno-pedagogical support to CWSN.

THEME 1 ***Parental skepticism towards techno pedagogy***

Participants strongly felt that parents often questioned their ability, whenever they recommended the usage of any apps or purchase of electronic gadgets to extend techno-pedagogic support. Participants also expressed dismay at parental behaviour of instantaneously verifying the authenticity of special educator's recommendations on web search engines such as Google or Bing:

SUB-THEME *Negative experiences with remuneration*

According to the participants, the prevalent preconceived notion amongst parents was that remote teaching doesn't require much effort and involvement on part of the special educator. Consequently, the parents constantly declined to pay them a deserving remuneration for services rendered.

I have a very tough time convincing parents that an online session is equally potent as an offline session. Sadly, the conversation would often culminate in unsavory bargaining about service charges. It is exhausting!!! (Participant 1, female special educator).

I had to endure some very caustic remarks from the child's parents questioning my professionalism. They say, "If I can watch a YouTube tutorial of this app and make the boy the use it, then why Am I paying you?" (Participant 3, male special educator).

THEME 2 ***Need for sensitization programs for parents with poor digital literacy***

Participants felt that many parents aren't that comfortable in the digital space. Unfortunately, not all apps offer their services in the languages known to the parent making it far from easy. They also disclosed that majority of parents rely on the support of neighbors' or random people to set up the device during an online class. Additionally, participants also revealed that many a times, valuable time is wasted in resolving technical glitches emanating from parental apathy towards device maintenance.

SUB THEME *Security Concerns*

Female Participants reported lower comfort levels and were apprehensive of sharing instructional videos featuring themselves with parents whose devices lacked pass codes or encryption of some kind. They were especially concerned in the context of multiple people using the same device or application.

I sometimes feel very guilty about not being able to share important informational videos featuring me with the child's mother. The phone is also used by the child's adolescent elder brother and his friends. It so happened that I found a picture of myself being shared as a WhatsApp story that I had clicked with the child accidentally and forgotten to delete..... I was mortified (Participant 2, female special educator).

THEME 3 *Disruption of learning continuity*

Majority of participants opined that there is severe difference in learning environment at home and school. They further added that most parents display a sense of laxity while helping child use a techno – pedagogic device to complete homework.

SUB THEME *Requirements of the parents precede the needs of the child.*

Participants expressed concerns that parents tend to use digital devices such as IPADs and Smart TVs as medium of recreation instead of learning tools while dealing with academic work of children with special needs.

It is very frustrating. Whenever I decide to use an IPAD to conduct an exercise, the child is more interested in opening a video on YouTube. It is very difficult to make a child transition to seeing an IPAD as a learning device and not a play toy. When I tried confronting the parents, they casually remark "We were just trying to calm her down and she likes browsing.....". (Participant 4, male special educator).

THEME 4 *Quality of parental feedback*

Participants mentioned that learning progress is hindered in the context of those children whose parents failed to provide a realistic picture of the learning process in the home environment. They went on to disclose that ambiguity concerning child's learning tends to limit the possibility of modification of IEPs or deployment of other functionally sound techniques relevant to the child's needs.

SUB THEME *Rich parental experiences*

Parent's observational recollections and accrued knowledge can provide vital information to the special educators about the efficacy of their methodology. Rich exchange of ideas between parents and special educators about the endless possibilities of creative and functional application of various techno-pedagogic tools can greatly enhance the child's learning progress.

I made repeated unsuccessful attempts at training a boy into performing simple mathematical calculations on a slate/book. Despite modifying and deploying various strategies, I always hit a dead end. The boy's grandmother later disclosed that he is quite excited in counting numbers orally while using an app on the smart TV. With this important information, I was able to execute a lot of learning exercises on the smart TV with considerable success. (Participant 5, female special educator).

Discussion

The findings from this study connect to this wider discussion on the need for understanding of and special education teachers' perspectives towards parental role in extending techno-pedagogic support to CWSN. The results of the thematic analysis uncovered the following themes(a) parental skepticism towards techno pedagogy (b) need for sensitization programs for parents with poor digital literacy (c) disruption of learning continuity (d) quality of parental feedback were identified.

Parental skepticism towards techno pedagogy

The present study found that majority of participants reported that parents of CWSN harbor a very negative view towards techno-pedagogic tools and processes. This finding is in contrast to existing studies (Flewitt, 2012; Marsh et al.,2005; Stephen et al., 2010). The present finding could be explained by the fact that penetration of technology into Urban Indian home is still in the infancy stage. In addition, increased sharing of misinformation about the disadvantages of technology on widely used platforms such as WhatsApp further exacerbate the negative views held by parents and relatives of CWSN towards technology in the learning context.

Need for sensitization programs for parents with poor digital literacy.

The results indicated that special educators strongly opine that poor digital literacy is a primary concern amongst parents of CWSN. The present finding is in line with existing research (Rice et al., 2017; Rice et al., 2019; Smith et al., 2017). This finding could be explained by reasoning that the level of digital literacy of the parent of CWSN could be directly related to their socioeconomic and occupational status. Additionally, inherent skepticism towards technology might have also further distanced these parents from exploring and learning to use techno-pedagogic tools.

Disruption of learning continuity

One of the study's findings revealed a grave concern expressed by special educators about the serious disruption of learning continuity of CWSN, especially in the context of remote learning under parental supervision. The present finding is in line with the existing research (Achtypi et al., 2023). The finding can explain as result of the difference in learning environment at school and home. In other words, technology can be potent when it is examined in congruence with the environment where is utilized (Abbott, 2007).

Quality of parental feedback

Considerable number of participants indicated that the success of their individualized education plan and the learning progress made by the CWSN depends heavily on the quality of inputs shared by the parent about the intricacies of the child's learning pace, processes, and trials etc. This finding is in line with existing research indicating that parents' feedback and suggestion might provide special educators with vital information to transform the curriculum (Ding et al., 2006). It is an undeniable fact that parents greatly understand the strengths and weaknesses of their children. As a result, the quality of communication between parents and special educators would enable special educators and parents to work together to create instructions tailor made to the child's need.

Conclusion

The researchers propose that the Government and public policy makers may fail to aid burgeoning population of CWSN in India unless and until they recognize and consider the concerns of parents of CWSN and special education teachers.

References

Abbott, C. (2007) 'E-inclusion: learning difficulties and digital technologies', *Challenges*, 27, 1–36.

Achtypi, A., Guldberg, K. K., & Papoudi, D. (2023). Using iPads for the social communication and emotional regulation of autistic pupils: an exploration of key stakeholders' perspectives and practices. *British Journal of Special Education*. https://doi.org/10.1111/1467-8578.12456

Aluri, U., & Karanth, P. (2002). Rehabilitation facilities available for children with autism/PDD in Bangalore city: A survey.*Asia Pacific Disability Rehabilitation Journal*, *13*(2), 115–124.

Altinay, Z., Altinay, F., Ossianilsson, E., & Aydin, C. H. (2018). Open education practices for learners with disabilities. BRAIN–Broad Research in Artificial Intelligence and Neuroscience, 9(4). https://www.edusoft.ro/brain/index.php/brain/article/view/874/1017.

Appleton, P. L., & Minchom, P. E. (1991). Models of parent partnership and child development centres. *Child: Care, Health and Development*, *17*(1), 27–38.

Barua, M., Kaushik, J. S., & Gulati, S. (2017). Legal provisions, educational services and health care across the lifespan forautism spectrum disorders in India. *The Indian Journal of Pediatrics*, *84*(1), 76–82.

Basham, J. D., Blackorby, J., & Marino, M. T. (2020). Opportunity in crisis: The role of universal design for learning in educational redesign. *Learning Disabilities: A Contemporary Journal*, *18*(1), 71–91.

Barnard-Brak, L., & Sulak, T. (2010). Online versus face-to-face accommodations among college students with disabilities. The American Journal of Distance Education, 24(2), 81–91. https://doi.org/10.1080/08923641003604251.

Berge, Z. L. (1995). Facilitating computer conferencing: Recommendations from the field. Educational Technology, 5(1), 22–30. http://www.jstor.org/stable/44428247.

Barroso, N. E., L. Mendez, P. A. Graziano, and D. M. Bagner. 2017. “Are Proactive and Reactive Aggression Meaningful Distinctions in Adolescents? A Variable- and Person-Based Approach.” *Journal of Abnormal Child Psychology* 45 (1): 1–13. doi:10.1007/s10802-016-0149-5.

Braun Vand Clarke V (2006) Using thematic analysis in psychology. Qualitative research in psychology 3(2):77–101. doi: 10.1191/1478088706qp063oa.

Braun Vand Clarke V (2019) Reflecting on reflexive thematic analysis. Qualitative Research in Sport, Exerciseand Health 11(4): 589–597. DOI: 10.1080/2159676X.2019.1628806

Brezis, R. S., Weisner, T. S., Daley, T. C., Singhal, N., Barua, M., & Chollera, S. P. (2015). Parenting a child with autism inIndia: Narratives before and after a parent-child intervention program. *Culture, Medicine, and Psychiatry*, *39*(2), 277–298.

Case, S. (2000). Refocusing on the parent: What are the social issues of concern for parents of disabled children? *Disability& Society*, *15*(2), 271–292.

Case, S. (2001). Learning to partner, disabling conflict: Early indications of an improving relationship between parents and professionals with regard to service provision for children with learning disabilities. *Disability & Society*,*16*(6), 837–854.

Cunningham, C., & Davis, H. (1985). *Working with parents: Frameworks for collaboration*. Open University Press.

Dale, N. (1996). *Working with families of children with special needs: Partnership and practice*. Routledge.

Daley, T. C. (2004). From symptom recognition to diagnosis: Children with autism in urban India. *Social Science &Medicine*, *58*(7), 1323–1335.

Dempsey, I., & Keen, D. (2008). A review of processes and outcomes in family-centered services for children with a disability. *Topics in Early Childhood Special Education*, *28*(1), 42–52.

Dempsey, I., & Dunst, C. J. (2004). Helpgiving styles and parent empowerment in families with a young child with a disability. *Journal of Intellectual and Developmental Disability*, *29*(1), 40–51.

Ding, Y., Gerken, K. C., VanDyke, D. C., & Xiao, F. (2006). Parents' and Special Education Teachers' Perspectives of Implementing Individualized Instruction in PR China--An Empirical and Sociocultural Approach. *International Journal of Special Education*, *21*(3), 138-150.

Divan, G., Vajaratkar, V., Desai, M. U., Strik-Lievers, L., & Patel, V. (2012). Challenges, coping strategies, and unmetneeds of families with a child with autism spectrum disorder in Goa, India. *Autism Research*, *5*(3), 190–200.

Dunst, C. J., & Dempsey, I. (2007). Family-professional partnerships and parenting competence, confidence, and enjoyment.*International Journal of Disability, Development and Education*, *54*(3), 305–318.

Edyburn, D. L. (2013). Critical issues in advancing the special education technology evidencebase. *Exceptional Children*, *80*(1), 7–24. https://doi.org/10.1177/001440291308000107

Edyburn, D. L. (2023). Reimagining the Future of Special Education Technology. In *Reimagining Education: Studies and Stories for Effective Learning in an Evolving Digital Environment* (pp. 281-292). Cham: Springer International Publishing.https://doi.org/10.1007/978-3-031-25102-3_23

Edmonds, C. D. (2004). Providing access to students with disabilities in online distance education: Legal and technical concerns for higher education. The American Journal of Distance Education, 18(1), 51–62. https://doi.org/10.1207/s15389286ajde1801_5.

Fitzgerald, J., & Radford, J. (2020). Leadership for inclusive special education: A qualitative exploration of SENCOs' and principals' Experiences in secondary schools in Ireland. International Journal of Inclusive Education, 26(10), 1–16. https://doi.org/10.1080/13603116.2020.1760365

Flewitt RS (2012) Multimodal perspectives on early childhood literacies. In: Larson J and Marsh J (eds) *The SAGE Handbook of Early Childhood Literacy*. London: SAGE, pp. 295–310.

Fichten, C. S., Ferraro, V., Asuncion, J. V., Chwojka, C., Barile, M., . . . Wolforth, J. (2009). Disabilities and e-learning problems and solutions: An exploratory study. Educational Technology & Society, 12(4), 241–256. https://www.jstor.org/stable/pdf/jeductechsoci.12.4.241.pdf.

Gavish, B. 2017. "Four Profiles of Inclusive Supportive Teachers: Perceptions of Their Status and Role in Implementing Inclusion of Students with Special Needs in General Classrooms." *Teaching and Teacher Education* 61: 37–46. doi:10.1016/j.tate.2016.10.004.

Griful-Freixenet, J., Struyven, K., Verstichele, M., & Andries, C. (2017). Higher education students with disabilities speaking out: Perceived barriers and opportunities of the universal design for learning framework. Disability & Society, 32(10), 1627–1649. https://doi.org/10.1080/ 09687599.2017.1365695.

Gérain, P., & Zech, E. (2020). Do informal caregivers experience more burnout? A metanalytic study. Psychology, Health & Medicine, 1–17. https://doi.org/10.1080/13548506.2020.1803372.

Harper, K. A., Kurtzworth-Keen, K., & Marable, M. A. (2017). Assistive technology for students with learning disabilities: A glimpse of the livescribe pen and its impact on homework completion. *Education and Information Technologies*, *22*(5), 2471–2483. https://doi.org/10.1007/s10639-016-9555-0

Hallett, F., & Hallett, G. (2010). Transforming the role of the senco: Achieving the national award for sen coordination. London: McGraw-Hill Education. http://ebookcentral.proquest.com/lib/ umeaub-ebooks/detail.action?docID=650300

Hodge, N., & Runswick-Cole, K. (2008). Problematising parentprofessional partnerships in education. *Disability & Society*,*23*(6), 637–647.

Hornby, G. (2015). Inclusive special education: development of a new theory for the education of children with special educational needs and disabilities. British Journal of Special Education, 42(3), 234–256. https://doi.org/10.1111/1467-8578.12101

Istenic Starcic, A., & Bagon, S. (2014). ICT-supported learning for inclusion of people with special needs: Review of seven educational technology journals, 1970–2011. *British Journal of Educational Technology*, *45*(2), 202-230.

Izzo, M. V., Yurick, A., & Mcarrell, B. (2009). Supported eText: Effects of text-to-speech on access and achievement for high school students with disabilities. *Journal of Special Education Technology*, *24*(3), 9–20.

Jones, C. (2004). *Supporting inclusion in the early years*. McGraw-Hill Education.

Jurkowski, S., M. Ulrich, and B. Müller. 2020. "Co-teaching as a Resource for Inclusive Classes: Teachers' Perspectives on Conditions for Successful Collaboration." *International Journal of Inclusive Education* 1–18. doi:10.1080/13603116.2020.1821449.

Kallio H, Pietil¨a AM, Johnson M, et al. (2016) Systematic methodological review: developing a framework for a qualitative semi-structured interview guide. Journal of Advanced Nursing 72(12): 2954–2965. DOI: 10.1111/jan.13031

Kalyva, E. (2013). Collaboration between parents of children with autism spectrum disorders and mental health professionals. In M. Fitzgerald (Ed.), *Recent advances in autism spectrum disorders* (Vol. I, pp. 521–563). InTech.

Kalyanpur, M., & Harry, B. (1999). *Culture in special education:Building reciprocal family-professional relationships*. PaulH. Brookes.

Kalyanpur, M., & Gowramma, I. P. (2007). Cultural barriers to South Indian families' access to services and educationalgoals for their children with disabilities. *Journal of the International Association of Special Education*, *8*(1), 69–82.

Kawamoto, T., K. Furutani, and M. Alimardani. 2018. "Preliminary Validation of Japanese Version of the Parental Burnout Inventory and Its Relationship with Perfectionism." *Frontiers of Psychology* 9: 1–10. doi:10.3389/fpsyg.2018.00970

Khanna, R., S. S. Madhavan, M. J. Smith, J. H. Patrick, C. Tworek, and B. Becker-Cottrill. 2011. "Assessment of Health-Related Quality of Life Among Primary Caregivers of Children with Autism Spectrum Disorders." *Journal of Autism and Developmental Disorders* 41 (9): 1214–1227. doi:10.1007/s10803-010-1140-6.

Kinash, S., Birt, J., & Judd, M. M. (2019). Is technology enabling or disabling for diverse learners studying online? In M. G. Moore & W. C. Diehl (Eds.), Handbook of distance education (4th ed., pp. 285–310). Routledge. https://doi.org/10.4324/9781315296135.

Laamanen, M., Ladonlahti, T., Uotinen, S., Okada, A., Bañeres, D., & Koçdar, S. (2021). Acceptability of the e-authentication in higher education studies: Views of students with special educational needs and disabilities. International Journal of Educational Technology in Higher Education, 18(4). https://doi.org/10.1186/s41239-020-00236-9.

Lansdown, G., Groce, N., Deluca, M., Cole, E., Berman-Bieler, R., Mitra, G., Farkas, A., Sabbe, L., Burlyaeva-Norman, A.: Children and Young People with Disabilities: Fact Sheet, (2013)

Lidström, H., & Hemmingsson, H. (2014). Benefits of the use of ICT in school activities by students with motor, speech, visual, and hearing impairment: A literature review. *Scandinavian journal of occupational therapy*, *21*(4), 251-266.

Marsh J, Brooks G, Hughes J, et al. (2005) *Digital Beginnings: Young Children's Use of Popular Culture, Media and New Technologies*. Sheffield: Literacy Research Centre, University of Sheffield.

McCabe, H. (2007). Parent advocacy in the face of adversity: Autism and families in the People's Republic of China. *Focus on Autism and Other Developmental Disabilities*, *22*(1), 39–50.

Minhas, A., Vajaratkar, V., Divan, G., Hamdani, S. U., Leadbitter, K., Taylor, C., & Green, J. (2015). Parents' perspectives on care of children with autistic spectrum disorder in South Asia-views from Pakistan and India. *International Reviewof Psychiatry*, *27*(3), 247–256.

McKnight, L. (2016). The case for mobile devices as assistive learning technologies: A literature review. *Human-Computer Interaction: Concepts, Methodologies, Tools, and Applications*, 1102-1117.

Moisey, S. D. (2004). Students with disabilities in distance education: Characteristics, course enrollment and completion, and support services. Journal of Distance Education, 19(1), 73–91. https://files.eric.ed.gov/fulltext/EJ807840.pdf.

Mikolajczak, M., & Roskam, I. (2018). A theoretical and clinical framework for parental burnout: The balance between risks and resources (BR2). Frontiers in Psychology, 9. https://doi.org/10.3389/fpsyg.2018.00886.

Mittler, P., Mittler, H., & Conachie, H. M. (1986). *Working together. Guidelines, for partnership between professionalsand parents of children and young people with disabilities*. http://files.eric.ed.gov/fulltext/ED335857.pdf

Nassaji H (2015) Qualitative and descriptive research: Data type versus data analysis. Language TeachingResearch 19(2): 129–132. DOI: 10.1177/1362168815572747

Nilsen, S. 2017. "Special Education and General Education – Coordinated or Separated? A Study of Curriculum Planning for Pupils with Special Educational Needs." *International Journal of Inclusive Education* 21 (2): 205–217. doi:10.1080/13603116.2016.1193564.

Nowell LS, Norris JM, White DE, et al. (2017) Thematic analysis: striving to meet the trustworthiness criteria. International Journal of Qualitative Methods 16(1). DOI: 10.1177/1609406917733847

Paju, B., A. Kajamaa, R. Pirttimaa, and E. Kontu. 2021. "Collaboration for Inclusive Practices: Teaching Staff Perspectives from Finland." *Scandinavian Journal of Educational Research*. doi:10.1080/ 00313831.2020.

Phuong, J., K. DiPasquale, and N. Rivera. 2021. "'If You're Gonna Be Inclusive, You Have to Be Inclusive on All Levels': Ableism in Teacher Collaboration." *TESOL Quarterly* 55 (3): 684–693. doi:10.1002/tesq.3032.

Perelmutter, B., McGregor, K. K., & Gordon, K. R. (2017). Assistive technology interventions for adolescents and adults with learning disabilities: An evidence-based systematic review and meta-analysis. *Computers & Education, 114*, 139–163. https://doi.org/10.1016/j.compedu.2017.06.005

Ravindran, N. (2012). *Parent and professional perspectives about autism spectrum disorders in South India: Beliefs,practices, and parent-professional relationships* [Doctoral dissertation, Virginia Commonwealth University].

Richards, H. (2019). Special Educational Needs Co-ordinator Perceptions of Practice and Potential: Investigating Education and Health Care Plan Implementation in Early Years and Primary Education. Doctoral dissertation. University of Worcester, UK. Retrieved from https://eprints.worc.ac.uk/id/eprint/9919

Rice, M., Oritz, K., Curry, T., & Petropoulos, R. (2019). A case study of a foster parent working to support a child with multiple disabilities in a full-time virtual school. *Journal of Online Learning Research*, *5*(2), 145-168.

Rice, M., Ortiz, K., Smith, S., & Mellard, D. (2017). Parents' perceptions of social/emotional support for their children with disabilities in fully online schools. Center on Online Learning and Students with Disabilities. http://www.centerononlinelearning.res.ku.edu/wpcontent/uploads/ParentReport3_SocSkills_Feb2018Update.pdf

Repetto, J., Cavanaugh, C.,Wayer, N., & Liu, F. (2010). Virtual high schools: Improving outcomes for students with disabilities. The Quarterly Review of Distance Education, 11(2), 91–104. https://eric.ed.gov/?id¼EJ914162.

Sheehey, P. H., & Sheehey, P. E. (2007). Elements for successful parent-professional collaboration: The fundamental thingsapply as time goes by. *TEACHING Exceptional Children Plus*, *4*(2), Article 3.

Smith, S., Ortiz, K., Rice, M., & Mellard, D. (2017). Parents' perceptions of special education service delivery when their children move to fully online learning.

http://www.centerononlinelearning.res.ku.edu/wpcontent/uploads/2017/05/ParentReport2_IEP_April2017.pdf

Soulis, S. G., Georgiou, A., Dimoula, K., & Rapti, D. (2016). Surveying inclusion in Greece: empirical research in 2683 primary school students. *International Journal of Inclusive Education*, *20*(7), 770–783. https://doi.org/10.1080/13603116.2015.1111447

Stiles, K., Mundry, S., & DiRanna, K. (2017). *Framework for Leading Next Generation Science Standards Implementation*. San Francisco: WestEd

Stephen C, McPake J and Plowman L (2010) Digital technologies at home: The experiences of 3- and 4-yearolds in Scotland. In: Clark MM and Tucker S (eds) *Early Childhoods in a Changing World*. Stoke-on- Trent: Trentham Books, pp. 145–154.

Stephenson, J., & Limbrick, L. (2015). A review of the use of touch-screen mobile devices by people with developmental disabilities. *Journal of autism and developmental disorders*, *45*, 3777-3791.

Tesolin, A., & Tsinakos, A. (2018). Opening real doors: Strategies for using mobile augmented reality to create inclusive distance education for learners with different-abilities. In S. Yu, M. Ally, & A. Tsinakos (Eds.), Mobile and ubiquitous learning: An international handbook (pp. 59–80). Singapore, Singapore: Springer Nature Singapore Pte Ltd.. https://doi.org/10.1007/

978-981-10-6144-8.

UNESCO. Institute for Statistics Glossary. 2019 [cited 2021 Oct 16]. Available from: http://uis. unesco.org/en/glossary-term/information-and-communication-technologies-ict

U. S. Department of Education. (2017). *Reimagining the role of technology in education: 2017 national education technology plan update*. http://tech.ed.gov.

Watson, A. H., Ito, M., Smith, R. O., & Andersen, L. T. (2010). Effect of assistive technology in a public school setting. *The American journal of occupational therapy : official publication of the American Occupational Therapy Association*, *64*(1), 18–29. https://doi.org/10.5014/ajot.64.1.18

Wedell, K. (2018). Points from the SENCo-Forum: The 'Points from the SENCo-Forum' column: Its 20th anniversary year. British Journal of Special Education, 45(1), 98–101. https://doi.org/10. 1111/1467-8578.12209

WHO. (2011). World report on disability. World Health Organization. https://www.who.int/ publications/i/item/9789241564182.

WHO. Global Cooperation on Assistive Technology (GATE) World Health Organization. 2019 [cited 2021 Oct 16]. Available from: https://www.who.int/ phi/implementation/assistive_technology/en/

Socio-Adaptive Functioning of Children with Autism and Typically Developing Children

Raghu Kiran Bolle* & Deyashini Lahiri*

* M. Phil. RP Scholar, Department of Rehabilitation Psychology, NIEPID.

* Lecturer, Department of Rehabilitation Psychology, NIEPID.

ABSTRACT

Adaptive functioning refers to the conceptual, social, and practical skills that allow individuals to adapt to their environment and to function in their daily lives. Individuals with Autism Spectrum Disorder (ASD) may not acquire adaptive skills at the same rate as their Typically Developing peers. Factors such as level of Intelligence and Severity of Autism Spectrum Disorder symptoms influence adaptive functioning over time and the variables may have differential effects on adaptive functioning in children with Autism Spectrum Disorder. The study aims to assess and compare the socio-adaptive functioning of children with Autism Spectrum Disorder and Typically Developing children. It is a descriptive research study composed of 60 children, consisting of 30 Typically Developing Children and 30 Children with Autism Spectrum Disorder ranging from 6 years to 16 years. The sample was selected through the purposive sampling technique. The results of the study reveal that Typically Developing children have more socio-adaptive functioning in comparison with children with Autism Spectrum Disorder. The socio-adaptive functioning in children with Autism Spectrum Disorder is primarily affected in the areas of communication and socialization which are the major components in determining the socio-adaptive functioning. Children with ASD obtained low to moderate levels of adaptive functioning. Whereas, the Typically Developing Children have high adaptive functioning.

Keywords: *Socio-adaptive Functioning, Autism Spectrum Disorder, Typically Developing Children, and Intellectual Disability*.

Introduction

Autism spectrum disorder is characterized by “persistent deficits in the ability to initiate and to sustain reciprocal social interaction and social communication, and by a range of restricted, repetitive, and inflexible patterns of behaviour and interests” (ICD-11).Autism spectrum disorder in children and adolescents have a high incidence of psychosocial disabilities including lower level of adaptive functioning (Ashwood et al., 2015, Duncan and Bishop, 2015, Kenworthy et al., 2010, Kraper et al., 2017, Pathak et al., 2019, Tillmann et al., 2019), Unable to start and maintain a friendship with others (Dean et al., 2014, Dovgan and Mazurek, 2019, Kasari et al., 2011), Rare or no participation in the leisure activities and organized activities (Ratcliff, Hong, & Hilton, 2018) and school absenteeism and refuse to attend school (Munkhaugen, Gjevik, Pripp, Sponheim, & Diseth, 2017).

Adaptive functioning refers to the conceptual, social and practical skills that allow individuals to adapt to their environment and function in their daily life. Adaptive functioning relies on the ability to flexibly make use of one's life skills when it is required at an age-appropriate level across different settings and daily activities.

Individuals with ASD may not acquire adaptive skills at the same rate as their typically-developing peers. It is likely that other variables, such as IQ and ASD symptom severity, are influencing adaptive functioning over time and that such variables may have differential effects on the adaptive functioning of youth with ASD depending on the youth’s age.

Review of Literature

Studies have consistently demonstrated that autistic children and adolescents, regardless of their intelligence quotient (Ashwood et al., 2015; Duncan and Bishop, 2015; Kenworthy et al., 2010; Kraper et al., 2017; Lopata et al., 2012; McDonald et al., 2016; Pathak et al., 2019; Tillmann et al., 2019), exhibit significant impairments in the level of adaptive functioning. This is in contrast to typically developing children and adolescents without autism (Hill, Gray, Kamps, & Varela, 2015; Kanne, Gerber et al., 2011; McDonald et al., 2016; Pathak et al., 2019; Tillmann et al., 2019). Furthermore, research has shown that children and adolescents with high-functioning autism have lower levels of adaptive behavior compared to their typically developing counterparts (Kanne et al., 2011; McDonald et al., 2016; Pathak et al., 2019; Tillmann et al., 2019). Inversely, studies have found that higher levels of intelligence are associated with lower levels of adaptive behavior in children with autism (Kanne et al., 2011; Pathak et al., 2019; Tillmann et al., 2019). Additionally, research has demonstrated a positive correlation between adaptive behavior and intelligence quotient, while a negative correlation exists between global socio-adaptive functioning and autism symptomology within the autism spectrum disorder (ASD) group (Kenworthy, 2010).

Purpose of the Study

The current study is to find out the socio-adaptive functioning and how it differs among children with autism spectrum disorder and typically developing children. There are differences in the determinants of individual functioning irrespective of the conditions. The study would look into determinants of Socio-adaptive functioning of the two groups.

Objectives

- To compare the socio-adaptive functioning of children with Autism Spectrum Disorder and Typically Developing children.

Hypotheses

- There would be a significant difference in socio-adaptive functioning between children with Autism Spectrum Disorder and Typically Developing children.

Methodology

The study population is composed of children with Autism Spectrum Disorder and Typically Developing Children between the age ranges of 6 to 16 years of age, who were selected by using the purposive sampling method. The sample size is 60 which include children with children with Autism Spectrum Disorder of 30 and Typically Developing Children of 30. In this study measure The Vineland Adaptive Behaviour Scales (VABS-II) is a commonly used measure of adaptive behaviour skills (Sparrow et al., 1985, 2005). The VABS-II has been shown to have excellent reliability and validity and has been used extensively with heterogeneous groups of children with autism. The Vineland is used to assess adaptive functioning in four domains: Socialization, Communication, Daily Living, and Motor Skills. A split-half reliability test determined the reliability of scores for two halves of the test using the standardization sample data. The Spearman-Brown formula was used to determine correlations of the domains and sub domains. Across the age groups, the Communication domain correlations ranged from 0.84 to 0.93. For the Daily Living Skills domain correlations ranged from 0.86 to 0.91. The Socialization domain ranged from 0.84 to 0.93. The Motor Skills domain ranged from .77 to 0.90.Test-retest Reliability: Average correlations were found to range between .76 and 0.92 across domains.

Results

The findings of the study reveal that the Percentage of male is 57.4%, and female is 23.1% of the typically developing children group. The percentage of the male is 42.6%, and female is 76.9% of the Autism Spectrum Disorder group. The X^2 of the gender was calculated to be 0.057. The t score of the age is calculated to .006. The test statistics of the variables were calculated to be <0.001 for the Socialization, Communication, Daily Living, and Motor Skills variables.

Table1: Table Comparison of the Demographic variables, and Socio-adaptive functioning domains between children with Autism Spectrum Disorder and Typically developing children.

Variables		Group TD	Group ASD	Total	t/ $\chi 2$
Gender (Male)	N	27	20	47	0.057
	Percentage%	57.4%	42.6%	100.0%	
Gender (Female)	N	3	10	13	
	Percentage%	23.1%	76.9%	100.0%	
Age	N	30	30	60	0.006
Communication	N	30	30	60	<0.001
	Percentage%	50%	50%	100%	
Daily Living	N	30	30	60	<0.001
	Percentage%	50%	50%	100%	
Social skills& Relationships	N	30	30	60	<0.001
	Percentage%	50%	50%	100%	
Physical activities	N	30	30	60	<0.001
	Percentage%	50%	50%	100%	

The results output reveals, upon analysis, that the Mean of Children with ASD is 103.5333, the standard deviation is 25.30740. The Mean of Typically developing children is 124.6000 and the standard deviation is 31.88.

Table2: Independent Sample Test

Group	TD	ASD
Mean	25.30740	103.5333
Std. Deviation	31.88406	124.6000
Std. Error Mean	5.82121	4.62048

The Independent Mann-Whitney U test is used for analysis. The obtained value, 0.071, is less than the significant value which is 0.50.

Table3: Hypothesis Test Summary

Sl. No	Hypothesis	Test	Sig	Decision
1	The distribution of Socio-Adaptive-Functioning is the same across Categories.	Independent-Samples Mann-Whitney U Test	0.071*	Retain the hypothesis.

*The significance level is 95% (α=0.50)

Discussion

The results of the current study indicate that typically developing children obtained higher scores in the four domains of socialization, communication, daily living, and motor skills, which are indicators of socio-adaptive functioning, compared to children with autism spectrum disorder. Children with autism spectrum disorder demonstrated lower scores in the domains of socialization and communication, while children with mild to high-functioning autism performed better in the domains of daily living and motor skills compared to those with mild to severe levels of autism.

Furthermore, higher levels of autism spectrum disorder severity and symptoms interfere with an individual's ability to learn adaptive skills. The severity of symptoms affects adaptive functioning and influences the level of intellectual functioning (Goutham et al., 2009). Younger children with high intellectual functioning and higher symptoms and severity of autism affect adaptive functioning, resulting in poor adaptive functioning than individuals with higher intellectual functioning and lower levels of autism spectrum disorder severity.

Children with Autistic Disorder showed improvements in Vineland's raw scores of daily living and communication skills from early childhood to adulthood, although no changes were noted in the children's social skills from middle childhood to adolescence. Cross-sectional analyses have shown that age is negatively associated with adaptive functioning standard scores on the Vineland (Kanne et al., 2011; Klin et al., 2007). Consistent with this pattern, longitudinal analyses with Vineland standard scores indicate that the rate of acquisition of adaptive skills is more attenuated among individuals with autism spectrum disorder than in their typically developing peers (Fisch et al., 2002; Gabriels et al., 2007). In these studies, the children's standard scores on the Vineland decreased over time (Gabriels et al., 2007).

Conclusion

It has been found, through the review of various studies, that the socio-adaptive functioning of children with disabilities, neurodevelopmental conditions, and typically developing children is diverse, regardless of the intellectual capacities of the children within these categories. Specifically, the study results indicate that the socio-adaptive functioning of children with Autism Spectrum Disorder is lower compared to typically developing children. Furthermore, there is no significant gender difference observed in children with Autism Spectrum Disorder and typically developing children.

References

Ashwood, K. L., Tye, C., Azadi, B., Cartwright, S., Asherson, P., & Bolton, P. (2015). Brief report: Adaptive functioning in children with ASD, ADHD and ASD+ ADHD. *Journal of autism and developmental disorders*, *45*, 2235-2242. Retrieved from https://pubmed.ncbi.nlm.nih.gov/25614019/

Duncan, A. W., & Bishop, S. L. (2015). Understanding the gap between cognitive abilities and daily living skills in adolescents with autism spectrum disorders with average intelligence. *Autism*, *19*(1), 64-72.

Fisch, G. S., Simensen, R. J., & Schroer, R. J. (2002). Longitudinal changes in cognitive and adaptive behavior scores in children and adolescents with the fragile X mutation or autism. Journal of autism and developmental disorders, 32, 107-114.

Gabriels, R. L., Ivers, B. J., Hill, D. E., Agnew, J. A., & McNeill, J. (2007). Stability of adaptive behaviors in middle-school children with autism spectrum disorders. Research in Autism Spectrum Disorders, 1(4), 291-303.

Gotham, K., Pickles, A., & Lord, C. (2009). Standardizing ADOS scores for a measure of severity in autism spectrum disorders. Journal of autism and developmental disorders, 39, 693-705.

Hill, T. L., Gray, S. A., Kamps, J. L., & Enrique Varela, R. (2015). Age and adaptive functioning in children and adolescents with ASD: The effects of intellectual functioning and ASD symptom severity. Journal of Autism and Developmental Disorders, 45, 4074-4083.

Kanne, S. M., Gerber, A. J., Quirmbach, L. M., Sparrow, S. S., Cicchetti, D. V., & Saulnier, C. A. (2011). The role of adaptive behaviour in autism spectrum disorders: Implications for functional outcome. Journal of autism and developmental disorders, 41, 1007-1018.

Kenworthy, L., Case, L., Harms, M. B., Martin, A., & Wallace, G. L. (2010). Adaptive behaviour ratings correlate with symptomatology and IQ among individuals with high-functioning autism spectrum disorders. *Journal of autism and developmental disorders*, *40*, 416-423.

Klin, A., Saulnier, C. A., Sparrow, S. S., Cicchetti, D. V., Volkmar, F. R., & Lord, C. (2007). Social and communication abilities and disabilities in higher functioning individuals with autism spectrum disorders: The Vineland and the ADOS. Journal of autism and developmental disorders, 37, 748-759.

Kraper, C. K., Kenworthy, L., Popal, H., Martin, A., & Wallace, G. L. (2017). The gap between adaptive behaviour and intelligence in autism persists into young adulthood and is linked to psychiatric comorbidities. *Journal of autism and developmental disorders*, *47*, 3007-3017.

Lopata, C., Fox, J. D., Thomeer, M. L., Smith, R. A., Volker, M. A., Kessel, C. M., ... & Lee, G. K. (2012). ABAS-II ratings and correlates of adaptive behaviour in children with HFASDs. Journal of Developmental and Physical Disabilities, 24, 391-402.

McDonald, C. A., Lopata, C., Nasca, B. C., Donnelly, J. P., Thomeer, M. L., & Rodgers, J. D. (2016). ABAS-II adaptive profiles and correlates in samples of children with HFASD or LFASD. Journal of Developmental and Physical Disabilities, 28, 769-783.

Pathak, M., Bennett, A., & Shui, A. M. (2019). Correlates of adaptive behavior profiles in a large cohort of children with autism: The autism speaks Autism Treatment Network registry data. *Autism*, *23*(1), 87-99.

Tillmann, J., San José Cáceres, A., Chatham, C. H., Crawley, D., Holt, R., Oakley, & Zwiers, M. P. (2019). Investigating the factors underlying adaptive functioning in autism in the EU-AIMS Longitudinal European Autism Project. *Autism Research*, *12*(4), 645-657.

Development of Technology Enabled TOT Module for using e-Saadhya platform

R C Saritha*, Ch Janaki*, Karthika V*, S D Sudarsan* Dr. R. Shilpa Manogna**, B.V. Ram Kumar*** & VRP Sheilaja Rao***

Centre for Development of Advanced Computing (C-DAC) Bangalore, No.1, Old Madras Road, Byappanahalli, Bengaluru

National Institute for the Empowerment of Persons with Intellectual Disabilities (NIEPID), Manovikas Nagar, Secunderabad

Ambika Sishu Kendra, Prakash Nagar, Kurnool, Andhra Pradesh

ABSTRACT

Globalization process prepares learners for a universal society. National curriculum framework 2005[1] and National Education Policy (NEP) 2020[2] paves the way for a national mandate for technology enabled pedagogy for inclusive schools. This is further advocated by Right to Education Act (RTE)2009 [3]and Rights of Persons with Disabilities Act (RPwD) 2016[4], which accommodates learner diversity with mild disability in inclusive schools. This paper's objective is to introduce techno-pedagogical indigenously designed e-Saadhya software (screening, assessment, intervention, evaluation, and materials used across learning settings) for learners with Autism Spectrum Disorder (ASD) associated with mild intellectual disability in inclusive and special schools.

Training of Teachers (TOT) module is proposed for wider implementation of e-Saadhya on PAN India basis to train Master of Trainers (MoT). e-Saadhya has been designed and piloted from 2011 to 2019, and revealed gaps due to lingual disparity, diversity in instructional methodologies and inequitable disability rehabilitation facilities.

The application of e-Saadhya in 2023 is more feasible due to policy support that welcomes accessing Children with Special Needs (CwSN) in special and inclusive schools. The translation of e-Saadhya in Indian vernacular languages - Hindi, Kannada, and Telugu makes it viable for PAN India implementation for training MoT's.

Keywords: Techno-Pedagogy, CwSN, Learner diversity, Special education, Inclusive education, Simulated instructional approach, Autism with Mild ID, Intellectual disability

Introduction and Purpose of the Study

The impact of technology on standards of the learning process directs teachers to use innovative technology enabled instruction that enhances the education environment [5], [6]. Thus, learner needs specific (learner needs) and general (society needs) are addressed by implementing Techno-Pedagogy for survival and success in Global society [7], [8].

Techno-Pedagogy is the need of the globalization era, RPD Act 2016 prioritizes protection of rights in inclusive society for Persons with Disabilities (PwDs). Resources and access through infrastructure enabled by Techno-Pedagogy in Indian context is mandatory to develop MoTs by designing TOT module. India has robust disability legislations and policies such as Educational Policy 1986, followed by NEP 2020, complimented by RTE Act 2009, RPD Act 2016 and National Trust 1999. However, our nation requires hand-in-hand partnership between rehabilitation & technology professionals and special parents. Hence the challenges faced emerge from lack of trained cadre, robust training for MoTs to implement a digital ecosystem can be a

solution for effective educational intervention and research for standardizing TOTs for MoTs.

C-DAC Bangalore and NIEPID Secunderabad collaborated to develop e-Saadhya in March 2011, first-of-its-kind, in India as a digital ecosystem, which simulates the environment for a special educator, therapists, parents and PwDs with ASD and Mild retardation. This framework is an end-to-end digital solution, recognized by UNESCO (2013) as one among top 10 projects in the domain of technology and disability rehabilitation and subsequently awarded the prestigious SKOCH "Order-of-Merit", certifying it as one of the India's best Smart Governance projects for the year 2014 [9]. e-Saadhya encompasses prevalent assessment tools related to ASD and ID, Individualized Education Plans (IEP), evaluation and reporting training outcomes by stakeholders and their roles associated with disability service provision.

The techno-pedagogical approach is innate to the design of e-Saadhya that envisages TOT for MoTs, for equipping staff in special and inclusive schools. The TOT module is essential as it addresses the current need for techno-pedagogical solutions, bridging a significant gap in instructional needs for PwDs across special and inclusive schools.

Translated version of e-Saadhya in Indian vernacular languages optimizes access to teaching staff to implement the software in regional languages Kannada in Karnataka state, Telugu in Andhra Pradesh and Telangana, Hindi across North, East, North-East and Western regions of the country where Hindi is widely prevalent. TOT for MoTs will be undertaken with collaborative partnership between C-DAC Bangalore and NIEPID, Secunderabad and its regional centers to fulfill the goal of PAN India implementation.

Methodology

Design of the e-Saadhya

The end-to-end framework e-Saadhya includes a special educator's environment with standard assessments, and IEP along with multimedia enriched learning environment. The child logs into the framework to access the personalized lessons and exercises which are created by the educator/parent from their login environment. The individual environment is embedded with Standardized Cognitive Accessibility as defined by World Wide Web Consortium (W3C) [10], features including clutter free screens, voice based navigational/guidance mechanisms, customizable responding pace, adjustable font sizes etc.

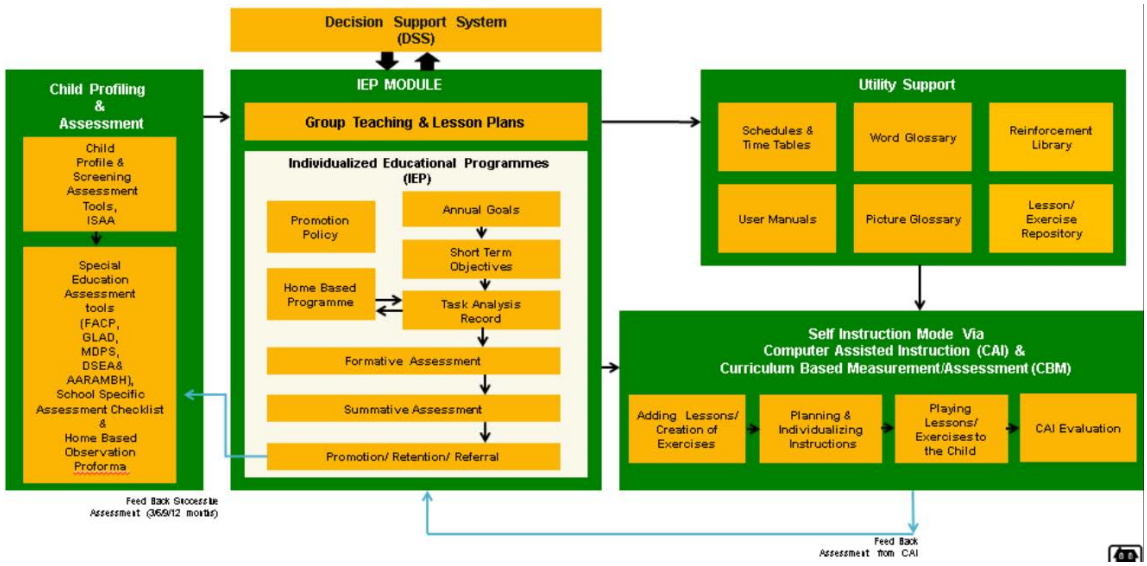


Figure 1: Architecture of e-Saadhya

The framework in Figure 1, offers an educational approach that covers both the receptive and expressive aspects of teaching/ learning through lessons and quizzes based on Applied Behavior Analysis (ABA) and Discrete Trial Training (DTT). In the context of DTT, audiovisual cues are used to facilitate teaching. Moreover, various forms of reinforcement, including music, videos, verbal prompts, auditory hand clapping and games, are provided to sustain the individual's motivation. To ensure personalized reinforcement for each individual, a checklist is employed, which can be documented, and reported by the special educator.

Hybrid Learning Transformation: Techno-Pedagogy Instructional Skills and Digital Competence

In the survey paper presented by Gowramma I P and Elizabeth G in 2021 [11], it has been reported that the findings of training conducted for 100 special educators by C-DAC Bengaluru in collaboration with NIEPID (formerly NIMH) and use of 'e-Saadhya' in 21 locations across India show that these are most useful in training and educating students with ASD and ID.

The e-Saadhya deployment in schools between 2013 and 2015 (prior to prevalence of conducive policy) and deployments between 2016-2019 under the following schemes across the country are listed in following Table 1.

Table 1: PAN India deployment of e-Saadhya through MOSJE, Govt. of India Schemes

Duration	Scheme	Location	Number of trained teachers and PwDs
2012 -2013	Pilot deployment of e-Saadhya version 1.0 and field testing	Special educators shortlisted from 20 schools were engaged for field trail across Hyderabad and Bangalore	40 Special Teachers
2013- till date	MOSJE, (GOI - Flagship Scheme) ADIP for BPL families across age groups and disability severity levels	Special educators were nominated and trained in operating e-Saadhya at Lucknow and Varanasi ADIP camps and this practice continues till date whenever ADIP camps are organized.	1384 laptops distributed between 2022-2023 reports and please visit https://niepid.nic.in/SCST_Students.php for previous year's reports.
2014- 2015	C-DAC Training	Vidya Vikasini school -Coimbatore	15

2015	C-DAC Training	Dakshinya, Guntur,AP	13
2015	C-DAC Training	NIEPID- Telangana	15
Since 2014	SC/ST Plan Fund- distributed 550 laptops to PwID's	Under the scheme, SC & ST PwDs were distributed with Laptops that installed e-Saadhya software, for PwIDs between age group 10-14 years attending special schools / home-based programs.	550 Laptops distributed to PwIDs
2016 to till date	Assistance to Disabled persons for purchasing / fitting of aids / appliances (ADIP)	Master trainers were trained on e-Saadhya by faculty from NIEPID (formerly NIMH), across the states of Meghalaya, Tripura, Assam, Sikkim.	146 Special Teachers
2014- 2015	PAN India deployment of e-Saadhya as directed by MeitY in 200 schools	Special Teachers were target group from states of Goa, Kerala, Andhra Pradesh, Tamil Nadu, Telangana and Karnataka representing cities below: Cochin, Ernakulam, Alappey, Vijaynagar, Medak, Anantapur, Davangere, Raichur, Gulbarga, Mangalore, Shimoga, Mehabubnagar, Neyveli, Nagapattinam, Coimbatore, Secunderabad, Visakhapatnam.	400 Special Teachers
2017-2019	RAISE-NE project (2017)	Five Special Teachers from 18 Special schools representing 5/7 North eastern states were trained on e-Saadhya which was implemented in inclusive schools	90 Special Teachers (NE)
Oct 2017	Regional Centre NCERT in NE - NIERI (Shillong)	Two lecturers from each Diet college from 5/7 state governments in NE, participated in e-Saadhya training to be implemented in respective states from 10 schools were trained across Jodhpur, Punjab, Ahmedabad, Jammu, Patiala, Chandigarh	10 Lecturers from Diet colleges.

2018-2019	Asha Kiran project for developing resource rooms in Inclusive Primary Schools under Indian Army Management	Teachers from 200 inclusive primary schools were trained on e-Saadhya for implementation in Indian army schools. The schools belonged to the states of Rajasthan, Jammu and Kashmir, Punjab, and Chandigarh.	800 Inclusive Teachers
2020-2023	C-DAC offered free training technical inputs on e-Saadhya	Installation support and training to Ambika Sishu Kendra, Kurnool	20 Special Teachers

Short listing of Teachers

Special Education MoTs: The MoT applicants eligibility will be based on RCI registration under courses at Diploma/B.Ed/M.Ed Special Education(ID) level qualified with minimum of3-5 years of experience working with CwSN with ASD and Intellectual Disability.

Inclusive Education MoTs: The MoT applicants must be permanent employees of inclusive schools registered with NCTE and qualified with Diploma/B.Ed/M.Ed in inclusion education with minimum of3-5 years of experience working with CwSN - ASD and ID would be desirable but not mandatory.

TOT Program prerequisites: With reference to the Leema K M and Dr. T. Mohamed Saleem, 2017[12], the prerequisites to improve the techno-pedagogical skills in the implementation of TOT module, the authors propose the following basic prerequisites which are as follows:

1. Availability of minimum 5 Desktop Computers/ Laptops exclusively for training CwSN
2. Availability of consistent power, internet connectivity, network security, ICT infrastructure and technology resources.
3. Proficiency in English and the respective Indian regional language (in the region concerned).
4. Basic Operational skills and computer literate for techno-pedagogical framework.
5. Effective resources to captivate students, with scope of digitization subjective to project resources.
6. Setting user-friendly/ hierarchical competency goals for MoT to spell out in the TOT module.
7. Lab safety, practicality, and manageability for regular interventions.

TOT Schedule

Based on the experiences and feedback of conducting short term duration programs for teachers ranging from 1 day to 90 days, the authors propose two models of Teacher training programs

Model-1 –ToT (Training of Teachers):

Duration of the program: Two Months

The program will be implemented in two phases.

Phase 1: Hands-on Training for 5 days

During this phase, the ToTs will be given training based on the importance of technology integrated pedagogy, design, and use of the e-Saadhya platform, using available resources in e-Saadhya, conducting e-Assessment and developing e-IEP.

Phase 2: Implementation at respective school for 6 weeks

After hands-on Training, the teacher needs to implement the learned skills with CWSN and give weekly feedback for 3 weeks. The feedback and implementation will be monitored by the designated technical team. 3 online meetings will be conducted to offer any kind of support and handholding to use the e-Saadhya platform effectively. After 3 weeks, the Teachers would be evaluated and given a certificate that they are trained teachers in implementing the e-Saadhya module.

Model-2 –MoT (Master of Trainer):

Duration of the program: 3 Months

Only those who have successfully completed 2 months TOT and implemented the program for a period of 6 months will be eligible for the Master of Trainer Training Program.

The monthly schedule to implement in both phases is as follows:

First Month: Case profile and registration (Blended Hybrid approach will be used to Train the MoTs)

1. Screening and Assessment
2. Planning of IEP
3. Implementation of IEP to CwSN (25)
4. Building partnerships with family and home

Second Month:

5. Review of IEP implementation and Progress
6. Application of e-Saadhya resources to enrich IEP
7. Creating technology rich content and resources (10)
8. Uploading 10 resources and Inter-sharing between schools

Third Month:

9. Inter-School interaction and sharing resources
10. Review of Implementation status and progress
11. Evaluating the programming outcomes

Every master trainer trains teachers within the period of one year. Every Master Trainer must target implementation of e-Saadhya in 5 schools in a phased manner. The capacity building from this program will run across 4 batches of 25 teachers in each batch by the master trainers so that their hands of experience for capacity building can be evaluated.

Conclusion

During the project e-Saadhya extensive field trail was undertaken as shown in the table to address learner diversity and teaching cadres where feasibility of the tool could be insightful. This helped the project team to shortlist a futuristic action plan for effective and wider implementation of e-Saadhya on PAN India basis. The deployment results clearly reveal application of the tool was completed with approximately more than 1500 special teachers, 400 Inclusive teachers, 10 Direct lectures, and trainers of inclusive teachers in NE and 550 PwDs on Laptops distribution. The tool has been extensively deployed from 2014 to 2022. The status of the deployment has been submitted as a

project report to MeitY, Govt. of India. After the project is completed, the training continues as and when requests come from beneficiaries.

Piloting the Indian vernacular version of e-Saadhya will enhance training of master trainers more meaningfully and increase the scope of participation at regional level. This has a potential for applicability in all developing countries.

References

[1] "nf2005-english.pdf." Accessed: Nov. 13, 2023. [Online]. Available: https://ncert.nic.in/pdf/nc-framework/nf2005-english.pdf

[2] "NEP_Final_English_0.pdf." Accessed: Nov. 13, 2023. [Online]. Available: https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf

[3] "Right to Education | Ministry of Education, GoI." Accessed: Nov. 13, 2023. [Online]. Available: https://dsel.education.gov.in/rte

[4] "the_rights_of_persons_with_disabilities_act,_2016.pdf." Accessed: Nov. 13, 2023. [Online]. Available: https://www.indiacode.nic.in/bitstream/123456789/15939/1/the_rights_of_persons_with_disabilities_act%2C_2016.pdf

[5] "6 Kamal.pdf." Accessed: Nov. 13, 2023. [Online]. Available: https://www.tnteuijer.com/publication/6%20Kamal.pdf

[6] S. BANSAL, "ROLE OF TECHNO-PEDAGOGICAL SKILLS FOR ENHANCING TEACHING AND LEARNING," *Journal of Positive School Psychology*, vol. 6, no. 2, pp. 3785–3793, 2022.

[7] R. Singh and S. Gupta, "Techno-Pedagogical Competence: Challenges and Resolving Measures for Teachers," vol. 10, no. 2, 2022.

[8] M. Demirok and B. Baglama, "Examining Technological and Pedagogical Content Knowledge of Special Education Teachers Based on Various Variables," *TEM Journal*, vol. 7, p. 507, Aug. 2018, doi: 10.18421/TEM73-06.

[9] "Skoch Award 2014," C-DAC. Accessed: Nov. 13, 2023. [Online]. Available: https://cdac.in?id=aboutus_bl_skoch_awards_2014

[10] "Cognitive Accessibility at W3C | Web Accessibility Initiative (WAI) | W3C." Accessed: Nov. 13, 2023. [Online]. Available: https://www.w3.org/WAI/cognitive/

[11] G. i P and E. Gangmei, "Research in Education of Children with Disabilities," Jun. 2021.

[12] L. K M and D. Saleem, "Infusion Of Techno Pedagogy In Elementary Teacher Education Curriculum: Perspectives And Challenges," *IOSR Journal of Humanities and Social Science*, vol. 22, pp. 06–10, Jan. 2017, doi: 10.9790/0837-2201010610.

EXPLORATORY STUDY ON GLOBAL INNOVATIVE TECHNO-PEDAGOGICAL METHODS FOR SPECIAL NEEDS CHILDREN

Shravani Bongu
shravani93@gmail.com

ABSTRACT

The present study seeks to explore the innovative pedagogical methods that can be integrated with technology to support inclusive education. Though there is a prevalence rate of about 8 million children with special needs in India, most mainstream schools are not inclusive and those that are, lack the right tools, training, and techniques to accommodate these children to their fullest potential. As the world speeds ahead in terms of technology, and every sector of the society is benefiting from it, it is a necessity that children with special need benefit from them as well.

The Techno-Pedagogic Approach delves to combine futuristic and traditional methods of teaching and learning in the rehabilitation of children with special needs. This study seeks to list out the different technology that is being used in a student-teacher environment all over the world such as

- TEXT TO SPEECH ASSISTIVE TOOLS (TTS)
- SWITCH DEVICES
- AUGMENTATIVE AND ALTERNATIVE COMMUNICATION DEVICES
- VIRTUAL REALITY
- ARTIFICIAL INTELLIGENCE

These different forms of technology act as a bridge in terms of communication, understanding, and relaying information that has been learnt. If they are used effectively, it would lead to a substantial difference in the present education system in regards to special needs. It is important for the students and teachers to be equally trained and equipped to utilize these forms of technology efficiently. The professional session also explores in detail about how these tools, skills and more are used in an inclusive school environment, how they benefit the child, and how the teacher can utilize it in their classroom.

Key Words: techno-pedagogic approach, inclusive schools, technology techniques, teacher-student relationship

Introduction

"Techno-Pedagogy" refers to the amalgamation of technology and teaching methodology. With technology surpassing borders and boundaries, it has the potential to compensate for the areas those special needs children are lacking in. It is able to bridge the gap between special needs children and other children without special needs.

With the help of technology, things that would have otherwise taken decades to achieve are being done in mere years. Technology is a boon for innovations and is dominant in every field of life. It is responsible for the boosting of research, developments, skills, products, and training. With such a vast field of application, the field of psychology should use it to its advantage and adopt the latest technology to help special needs children.

Educational Technology, or EdTech, is one of the upcoming streams of education which focuses on training teachers with the technology to help students be optimal learners. The Association for Educational Communications and Technology (AECT) has defined Educational Technology as "the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological

processes and resources." According to Loyola University Maryland, "Educational Technology is the field of study that investigates the process of analyzing, designing, developing, implementing, and evaluating the instructional environment, learning materials, learners, and the learning process in order to improve teaching and learning." Educational technology is a triadic relation between teachers, students, and technology. While the teachers are trained and educated on the latest tools, the students are the users who interact with this technology to make learning easier.

Presently, there is a wide variety of technology available for special needs children and it only gets longer from time and time again. Thus, it is important to choose the one that meets the child's needs the best. For this, teachers and parents must first be educated about the technology that is available and have the ability to discriminate between the ones that are the most appropriate fit.

Methodology

The following is a list of some of the technology that is available for special needs children that can be used in the classroom. This technology is also known as **Assistive Technology.** This list is not exhaustive by any means.

1. **TEXT TO SPEECH ASSISTIVE TOOLS (TTS)**:

Text To Speech is an assistive tool that converts the written language into an audio aid. It is extremely useful for children with print disabilities such as Dyslexia, visual impairment, learning disabilities as well as for children with Autism, ADHD, and intellectual disability. It removes the need for all written print and when paired with Speech to Text Assistive Tools, it eliminates the need for reading as well.

It is of great use for children with special needs as they do not have to know how to read in order to understand the content. It is also especially useful for children who are unable to sit at one place and read, but instead can listen to the information while on the go.

2. **SWITCH DEVICES**:

Switch devices refer to the assistive technologies used by individuals who have mobility difficulties such as Cerebral Palsy. It refers to a mechanism where a computer, tablet, or phone is controlled by different switches which are accessible to an individual. These "switches" can be a joystick, a button, or even blowing in air.

Sip and Puff Systems is a switch device that allows an individual to send signals using inhalation of air (sips) or soft and hard blows of air (puffs). These signals are transmitted and picked up by a specialised computer that translates these sips and puffs into outputs the individual wants to make.

These switch devices have endless possibilities of uses in the classroom. The child can use the switch to communicate with the teacher and other classmates. He can also participate in worksheets and activities by selecting the right option using the switch. The child can also access digital learning materials.

3. **AUGMENTATIVE AND ALTERNATIVE COMMUNICATION DEVICES**:

Augmentative and Alternative Communication Devices (AAC Devices) are communication tools used by individuals who are non-verbal or are low on speech through devices such as tablets or laptops that help them communicate. These devices have pre programmed options that an individual can choose from based on the needs of the individual. It leads to an increased independence in their daily life and improves social connections and communication.

AAC Devices are very useful in the classrooms as it allows the child to interact in class even with his limited speech. The AAC devices can be customized to best suit the age and class the child is in.

4. VIRTUAL REALITY:

Individuals with special needs, such as those with autism, benefit greatly with technology such as Virtual Reality. They often face difficulties when placed in a social environment, and through Virtual Reality they are able to practice their social and communication skills in a non-threatening environment.

It also enables the child to learn real world skills such as purchasing, safety, community building, etc. in a safe space. They are able to go to the grocery store, get on a bus, or interact with other members of the society without any dangers associated.

5. ARTIFICIAL INTELLIGENCE:

Artificial Intelligence has been increasingly used in special education classrooms. Through AI, teachers are able to create a personalized learning experiment for the child. The child's attention span, concentration skills, speech and communication can all be tracked and an appropriate teaching pattern is adopted.

AI can also help educators and therapists collect and analyze vast amounts of data related to student's progress and behaviours. This data-driven approach can inform better decision-making, identify trends and help tailor interventions to each student's unique needs.

Conclusion

With breakthroughs in technology happening every day, it is safe to say that we can rely on technology to help us aid special needs children in the classroom. Educators and therapists should be trained and educated on the latest developments of technology and adopt the methods which would suit the child the best. Parents should be kept informed as well so that the home environment is similar to the classroom environment and the child is well adapted to both.

It is wrong to assume that all technology or the same technology would be suitable for every special needs child. Thus, it is the responsibility of both the educator and the parent to first properly understand the child's disability. Based on the diagnosis and present state of comprehension of the child, a route map must be planned with frequent insights and interventions to ascertain that the child is following it. In cases where the child is advancing or not, the necessary changes should be made. Technology can be used in this sense as well in terms of tracking the progress of the child, and relaying the information back to the teacher and parents. By doing so, this feedback would direct the next course of action.

School management has to be equally responsible in ensuring that the child has a supportive school environment and necessary changes should be made to facilitate the child. These can range from physical changes to the school such as adding ramps, or adopting technological methods to social training of all the teachers and fellow students to be sensitive to the needs of the special child. In case of a special needs school, the management should be cognizant that multiple children would require multiple different facilitators in the environment. The management should take suggestions from the parents, teachers, and the student himself and provide a cohesive learning environment. It is suggested to the management to also be aware and adopt present government schemes that allow for a seamless teaching in an inclusive school.

Technology can be both a boon and a bane, and keeping in mind the disadvantages of technology, appropriate measures should be taken while choosing and implementing technology methods in the classroom. Technology in the classroom should only add to the learning but should not be disruptive to the special needs child or other children of the classroom as well. Teachers and students should be trained well in how to use this technology to its fullest potential.

The above methods of technology ranging from text to speech, to virtual reality, to augmented reality and artificial intelligence offer a plethora of services. Therefore, it is a must that the technology which is feasible and useful to be adopted according to the needs of the child and needs of the environment. Educators should always be on the lookout for the latest additions to technology and should have an open attitude in adopting these novel methods in their classroom for the benefit of the special needs child.

References

1. *How Children With Special Needs Are Being Left Out of Mainstream Education in India*. (n.d.). The Wire. https://thewire.in/rights/disabled-children-mainstream-education-exclusion
2. The University of Texas Permian Basin. (2020, November 3). *The use of Technology in special Education | UT Permian Basin Online*. The University of Texas Permian Basin | UTPB. https://online.utpb.edu/about-us/articles/education/the-use-of-technology-in-special-education/
3. Dikusar, A. (2021). The Use Of Technology In Special Education. *eLearning Industry*. https://elearningindustry.com/use-of-technology-in-special-education
4. J, N. (2023). How Special Education Teachers can use Technology to enhance learning? *upEducators - Helping Teachers, Educators, Tutors, Tuitions and Parents in Online Teaching With Technology*. https://www.upeducators.com/blog/how-special-education-teachers-can-use-technology-to-enhance-learning/
5. Behrmann, M. (1998). Assistive technology for young children in special Education: It makes a difference. *Edutopia*. https://www.edutopia.org/assistive-technology-young-children-special-education
6. Kazmi, R. (2023, June 23). *The benefits of technology in special education*. Koombea. https://www.koombea.com/blog/the-benefits-of-technology-in-special-education/
7. *What is Educational Technology - School of Education - Loyola Maryland*. (n.d.). https://www.loyola.edu/school-education/blog/2021/what-is-educational-technology
8. Richey, R.C. (2008). "Reflections on the 2008 AECT Definitions of the Field". *TechTrends*. Springer Science and Business Media LLC. **52** (1): 24–25. doi:10.1007/s11528-008-0108-2. ISSN 8756-3894. S2CID 189912472
9. Daley, S. (n.d.). *Education Technology: What is Edtech? A guide*. Built In. https://builtin.com/edtech
10. Staff, T. (2023, October 12). *15 Assistive Technology Tools & Resources For Students With Disabilities*. TeachThought. https://www.teachthought.com/technology/assistive-technology/
11. Weitzman, C. (2022, August 30). Text To Speech For Special Needs | Speechify. *Speechify*. https://speechify.com/blog/text-to-speech-for-special-needs/?landing_url=https%3A%2F%2Fspeechify.com%2Fblog%2Ftext-to-speech-for-special-needs%2F
12. Lingraphica. (2023, May 12). *What is an AAC Device? Overview and Benefits | Lingraphica*. https://lingraphica.com/aac-devices/what-is-an-aac-device/#:~:text=An%20augmentative%20and%20alternative%20communication,device%20or%20simply%20communication%20device.
13. Digital Frontier. (n.d.). *Virtual reality for special education – digital frontier*. https://wearedigitalfrontier.com/virtual-reality-for-special-education/
14. Team, F. (n.d.). The Role Of Technology In Special Education. *Fairgaze*. https://fairgaze.com/educationnews/the-role-of-technology-in-special-education.html#:~:text=Examples%20include%20screen%20readers%2C%20text,specific%20needs%20of%20each%20student.
15. Bone, C., & Smith, C. (2023, September 30). Artificial Intelligence in Special Education | frog, part of Capgemini Invent. *frog, part of Capgemini Invent*. https://www.frog.co/designmind/artificial-intelligence-in-special-education

TECHNO-PEDAGOGIC APPROACH IN REHABILITATING CHILDREN WITH SPECIAL NEEDS: GAMIFICATION AND LEARNING

Sonia Rani. L
Lecturer and Special Educator sonia.rehab23@gmail.com

ABSTRACT

Children with special needs face various challenges in their educational and developmental journeys. They often require special attention, personalized instruction, and specific interventions to enhance their cognitive, social, and emotional abilities. In recent years, there has been a growing interest in utilizing educational technologies and gamification techniques to support the rehabilitation of these children. This research aimed to explore the use of a techno-pedagogic approach, specifically gamification, in rehabilitating children with special needs. The objective of this research was to investigate the impact of gamification on motivation and learning outcomes in children with special needs. The methodology involved conducting interviews with educators and parents of children with special needs. The findings of this research will provide valuable insights into the effectiveness of using a techno-pedagogic approach to rehabilitating children with special needs.

Keywords Special needs education, Techno-pedagogic approach, Gamification, Learning outcomes, Motivation, Rehabilitation strategies

Introduction

Children with special needs often face unique challenges in their educational and developmental journeys. These challenges can range from physical disabilities to cognitive differences, so it is critical to tailor educational approaches that effectively address their specific needs. This research aims to explore a techno-pedagogical approach, specifically the implementation of gamification, as a promising way to rehabilitate and support the growth of children with special needs.

Innovations in education and teaching have recently been enabled by the development of digital technology (Jdaitawi, 2019, 2020a, 2020b; Jdaitawi&Kan'an, 2022; Manzano-Leon et al., 2021; Muhaidat et al., 2022 Rasheed et al., 2021; Soliman) and also 2022). Specialized teaching and learning techniques are required in special education to enable the acquisition of knowledge and skills of people with special needs, including communication and behavioral skills (Jdaitawi&Kan'an, 2022; Jdaitawi et al., 2022a, Barragash et al., 2019; Cifuentes et al., 2016 Manzano-Leon et al., 2022). Many people around the world suffer from illnesses, whether cognitive or physical, need more support during their education (Adam &Tatnall, 2017.

Research has shown that gamification can be beneficial in promoting various skills such as social, psychological and educational (Zainuddin et al., 2020; Zimmerling et al., 2019). A research was conducted to determine the benefits, chances and difficulties faced by students when applying gamification application in education (Zainuddin et al., 2020). These investigations include a meta-analysis by Kalogiannakis et al. (2021), including twenty-four research articles published between 2012 and 2020. The authors revealed significant effects of gamification on student motivation, engagement and learning, as well as interpersonal communication. As reported by Hursen and Bas (2019) and Cakir and Korkmaz (2019), the offer. In an atmosphere that is disciplined and stimulating, children with special educational needs can cultivate life skills.

Objectives

- To evaluate the impact of gamification on the motivation and level of interest of children with special needs in the educational environment.
- To investigate the effect of gamification on learning outcomes for children with special needs.

Methodology

Fifty pedagogues who have experience working with children with special needs and 50 parents of children with special needs participated in the research. A diverse sample of participants was sought to capture a wide range of perspectives and experiences.

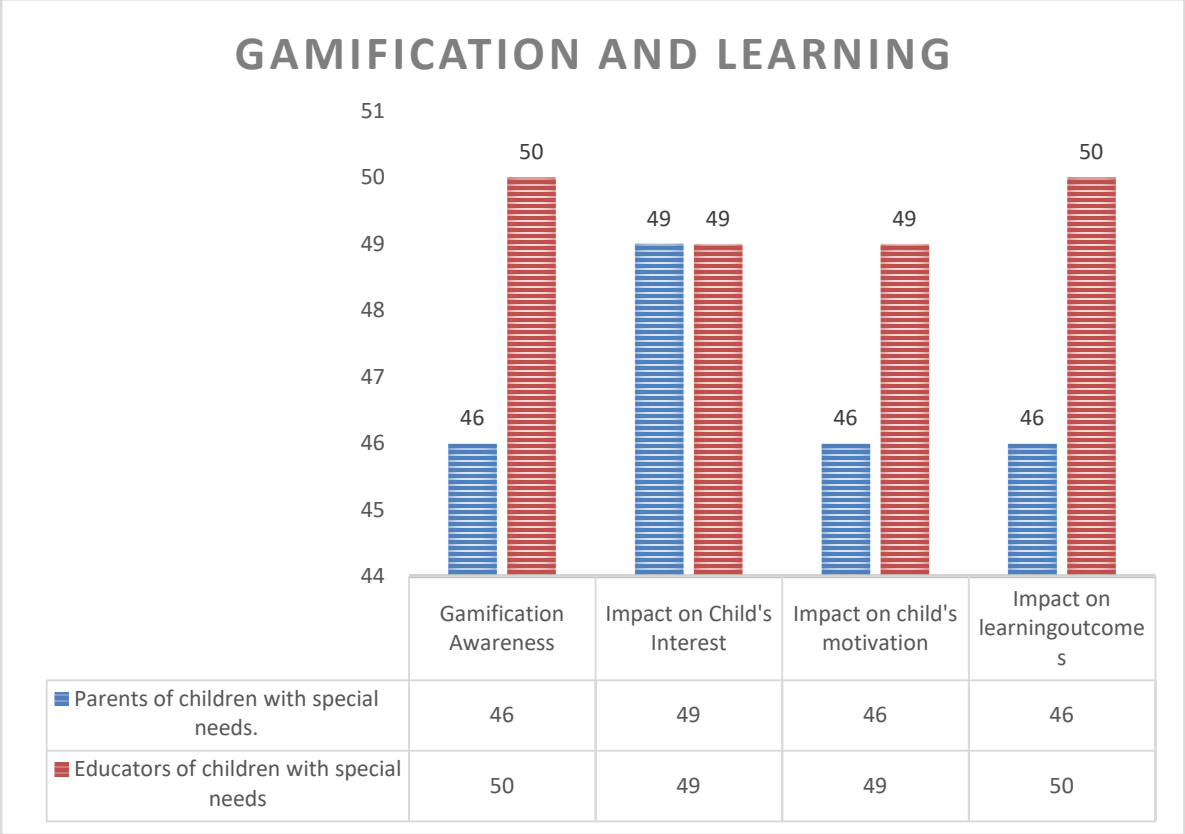
The researcher used a self-prepared questionnaire. And they are semi-structured interviews with educators who work with children with special needs. The interviews focused on their awareness of gamification, its impact on the child's interest, and its impact on the child's motivation and learning outcomes.

The Gamification Awareness Questionnaire examines participants' familiarity with gamification in education, including prior awareness, self-understanding, and knowledge of the application of gamification in the education of their children or students, and beliefs about its potential to improve educational experiences for children with special needs. In a parallel vein, the Child Interest Impact Questionnaire focuses on the impact of gamification on children's interest, including increased engagement, enthusiasm during Gamified activities, and the relative effectiveness of Gamified approaches. The Impact on Child's Motivation Questionnaire also looks at levels of motivation, looks at active participation, willingness to complete tasks, overall motivation to learn and compares gamification to traditional teaching methods. Brief and targeted yes/no questions in the Learning Outcomes Questionnaire seek participants' views on the positive impact of gamification, improved learning outcomes and its contribution to personalized learning experiences for children with special needs, and provide a comprehensive view of their perspectives on gamification in special education.

Results

The results highlight a remarkable level of awareness and engagement with gamification among parents (46%) and educators (50%) of children with special needs. Both groups express a positive perception of gamification, with 49% of parents and educators acknowledging its impact on the child's interest. In addition, 46% of parents and 49% of educators recognize the positive influence of gamification on a child's motivation. When it comes to learning outcomes, 46% of parents and 50% of educators recognize the potential of gamification to positively impact the educational outcomes of children with special needs. Together, these findings underline the positive acceptance and recognition of the benefits of gamification from both parents' and educational perspectives in the context of special education and reveal a highly positive impact on the rehabilitation and education of children with special needs. Participants, including educators and parents, demonstrated a strong awareness and understanding of gamification and actively sought information about its application. Gamification significantly increased children's interest in learning, increased engagement and increased enthusiasm during Gamified activities. In addition, participants reported increased motivation, greater willingness to complete tasks, and better overall motivation to learn when gamification was incorporated. Together, the findings highlight the effectiveness of gamification in improving educational pathways for children with special

needs and provide valuable insights for future educational strategies and interventions in special education.



Discussion

The results indicate a significant level of awareness and positive acceptance of gamification in both the parenting and educational communities dealing with children with special needs. The fact that 46% of parents and 50% of educators demonstrate awareness and engagement with gamification suggests a promising foundation for integrating Gamified approaches into special education. This awareness is consistent with the participants' positive perception of the impact of gamification on the child's interest, with 49% of both groups acknowledging its positive impact. This alignment is a significant finding as it underscores the shared recognition of the potential of gamification to increase engagement and interest in educational activities for children with special needs.

The study also shows that 46% of parents and 49% of educators recognize the positive influence of gamification on a child's motivation. This finding is crucial because increased motivation may be a key factor for active participation and task completion and promotes a positive learning environment. The recognition of the positive effect of gamification on motivation is consistent with previous research emphasizing the motivational benefits of Gamified educational approaches.

In terms of learning outcomes, the study shows that 46% of parents and 50% of educators recognize the potential of gamification to positively impact the educational outcomes of children with special needs. This finding is particularly encouraging and suggests that gamification could contribute to improving learning outcomes and academic achievement for this demographic. Acknowledgments from both parents and educators further support the view that gamification can be an effective pedagogical tool in adapting educational approaches to the specific needs of children with special needs.

Collectively, these results indicate that there is a shared understanding and appreciation of the potential benefits of gamification in special education. Comparing perspectives between parents and educators means a coherent recognition of the positive impact of gamification on a child's interest, motivation and learning outcomes. This unity of perception provides a solid foundation for future exploration and implementation of gamification strategies in the rehabilitation and education of children with special needs and offers valuable insights for educators, parents, and researchers.

Conclusion

In conclusion, it is pointed out that children with special needs, such as children with disabilities or learning difficulties, can greatly benefit from the use of gamification in the classroom. Teachers could develop their own learning experiences by adapting the games to each student's unique needs and learning style.

Greater involvement of children is possible because instant feedback from games allows children to learn from their failures and successes in real time, which can be very useful for children with special needs who need more support. design dynamic and engaging learning experiences that meet the specific needs of children with special needs by incorporating play elements into their learning activities. We understand that gamification increases motivation, where the use of badges, points or awards can help inspire special children to complete tasks and meet educational goals. Cooperative play or friendly competition can improve the motivation and social skills of children with special needs. There are also improvements in learning outcomes in the form of interactive learning and problem solving skills.

By encouraging active engagement, gamification helps students with special needs better understand subjects through practical applications. Games often require the development of problem-solving, critical thinking and decision-making skills – all of which are crucial for children with special needs. Special educators were of the opinion that gamification provides a measure or positive learning environment that reduces anxiety, and games can provide a low-stress environment where unique children can learn without fear of being judged and learning becomes an unfulfilled task. The study highlights that parents and educators felt that social skills in special children were enhanced. Cooperative games, whether team-based or multiplayer, can help develop social skills in children with special needs, including cooperation, empathy and communication.

Through gamification, children with special needs were able to engage in peer interaction with their classmates and create friendships and social bonds. Gamification enables tracking of progress and individualized support, development of life skills and time management. So we understand that gamification requires careful planning and consideration of the unique needs and talents of children with special needs in order to incorporate gamification into their learning process. It is critical for teachers to select games and exercises that complement learning objectives and offer engaging, inclusive, and accessible experiences for all students. Involving parents and caregivers in Gamified learning processes can also promote a positive learning atmosphere at home and at school.

Limitations

Although the study provides valuable insights into the positive impact of gamification on children with special needs, several limitations must be acknowledged. First, the sample size of 50 educators and 50 parents may limit the generalizability of the findings. A larger and more diverse pool of participants could provide a more

comprehensive understanding to a wider population. Second, relying on data obtained through questionnaires and interviews introduces the possibility of biasing the responses. Future research could benefit from incorporating objective measures or observational methods to verify the reported results. In addition, the study focused on perceptions and awareness of gamification; a longitudinal study evaluating long-term effects would further contribute to the literature.

Recommendation

Based on these findings, it is recommended that future research examine the longitudinal effects of gamification on the academic and social-emotional development of children with special needs. A larger and more diverse pool of participants, including different categories of special needs, could increase the generalizability of the results. In addition, incorporating qualitative methods such as in-depth interviews or focus group discussions can offer a richer view of the diverse experiences of children, parents and educators. As technology evolves, investigating the effectiveness of different gamification platforms and technologies tailored to specific special needs conditions could further refine educational interventions. Finally, collaboration between educators, parents, and game designers is necessary to develop and implement Gamified interventions that align with the individualized needs and preferences of children with special needs.

References

Adam, T., & Tatnall, A. (2017). The value of using ICT in the education of school students with learning difficulties. *Education and Information Technologies*, *22*(6), 2711-2726. https://doi.org/10.1007/s10639-017-9605-2

Alomari, I., Al-Samarraie, H., & Yousef, R. (2019). The role of gamification techniques in promoting student learning: A review and synthesis. *Journal of Information Technology Education: Research, 18*, 395-417. https://doi.org/10.28945/4417

Alsawaier, R. (2018). The effect of gamification on motivation and engagement. *International Journal of Information and Education Technology*, *35*(1), 56-79. https://doi.org/10.1108/IJILT-02-2017-0009

Andrade, G., Costa, R., & Werneck, V. (2020). Stop-dengue: Game for children and adolescents with down syndrome. *International Journal of Innovation Education and Research, 8*(10), 528-540. https://doi.org/10.31686/ijier.vol8.iss10.2709

Arzone, C., Mottan, K., &Saad, K. (2020). *The relationship between gamification and emotional intelligence among children with autism spectrum disorder* [Paper presentation]. International Conference on Special Education in South East Asia Region. https://doi.org/10.32698/GCS-04320

Arenas, M. & Cruze, J. (2019). Analyzing the students behavior with down syndrome in a Gamified learning environment. *International Journal of Recent Technology and Engineering*, *8*(2), 1839-1845.

htpps://doi.org/10.35940/ijrte.B1030.078219

Baragash, R., Al-Samarraie, H., Alzahrani, A., &Alfarraj, O. (2019). Augmented reality in special education: A meta-analysis of single-subject design studies. *European Journal of Special Needs Education, 35*(3), 382-397. https://doi.org/10.1080/08856257.2019.1703548

Cakir, R., &Korkmaz, O. (2019). The effectiveness of augmented reality environment on individuals with special education needs. *Education and Information Technologies*, *24*(2), 1631-1659. https://doi.org/10.1007/ s10639-018-9848-6

Chan, G., Santally, M., & Whitehead, J. (2022). Gamification as technology enabler in SEN and DHH education. *Education and Information Technologies*, *27*(7), 1-34. https://doi.org/10.1007/s10639-022-10984-y

Cifuentes, S., Garcia, S., Andres-Sebastia, M., Camba, J., &Contero, M. (2016). *Augmented reality experiences in therapeutic pedagogy: A study with special needs students* [Paper presentation]. The 2016 IEEE 16th International Conference on Advanced Learning Technologies. https://doi.org/10.1109/ICALT.2016.23

Contereras, M., Bauza, C., & Santos, G. (2019). Videogame-based tool for learning in the motor, cognitive and socio-emotional domains for children with intellectual disability. *Entertainment Computing*, *30*, 100301. https://doi.org/10.1016/j.entcom.2019.100301

Dandashi, A., Karkar, A., Saaw, S., Barhoumi, Z., Aljaam, J., &Saddik, A. (2015). Enhancing the cognitive and learning skills of children with intellectual disability through physical activity and educational games. *International Journal of Distributed Sensor*, *11*(6). https://doi.org/10.1155/2015/165165

Davis, K., Sridharan, H., Keopke, L., Singh, S., &Boike, R. (2018). Learning and engagement in a gamified course: Investigating the effects of student characteristics. *Journal of Computer Assisted Learning*, *34*(5), 492-503. https://doi.org/10.1111/

Demir, U. (2022). An examination of the impact of game-based geometric shapes education software usage on the education of students with intellectual disabilities. *ECNU Review of Education*, *5*(4), 761-783. https://doi.org/10.1177/2096531120940721

Durango, I., Carrascosa, A., Gallud, J., &Penichet, V. (2018). Interactive fruit panel (IFP): A tangible serious game for children with special needs to learn an alternative communication system. *Universal Access in the Information Society*, *17*, 51-65. https://doi.org/10.1007/s10209-016-0517-5

Eldenfria, A & Al-Samarraie, H. (2019). Towards an online continuous adaptation mechanism (OCAM) for enhanced engagement: An EEG study. *International Journal of Human-Computer Interaction*, *35*, 1960-1974. https://doi.org/10.1080

Folmar, D. (2015). *Game it up: Using gamification to incentivize your library*. Rowman & Littlefield. Fridenso n-Hayo, S., Berggren, S., Lassalle, A., Tal, S., Pigat, D., Meir-Goren, N., O'Reilly, H., Ben-Zur, S., Bölte, S., Baron-Cohen, S., & Golan, O. (2017). 'Emotiplay': A serious game for learning about emotions in children with autism: Results of a cross-cultural evaluation. *European Child & Adolescent Psychiatry*, *26*, 979-992.

https://doi.org/10.1007/s00787-017-0968-0

Gooch, D., Vasalou, A., Benton, L., & Khaled, R. (2016). *Using gamification to motivate students with dyslexia* [Paper presentation]. The CHI Conference. https://doi.org/10.1145/2858036.2858231

Hew, K. F., Huang, B., Chu, K. W., & Chiu, D. K. W. (2016). Engaging Asian students through game mechanics: Findings from two experiment studies. *Computer and Education*, *92-93*, 221-236. https://doi.org/10.1016/j.compedu.2015.10.010

Hulusic, V., &Pistoljevic, N. (2017). *A curriculum for developing serious games for children with autism: A success story* [Paper presentation]. 9th International Conference on Virtual Worlds and Games for Serious

Application. https://doi.org/10.1109/VS-GAMES.2017.8056586

Hursen, C., & Bas, C. (2019). Use of gamification application in science education. *International Journal of Emerging Technologies in Learning, 14*(1), 4-23. https://doi.org/10.3991/ijet.v14i01.8894

James, M. (2020). *The impact of game-based learning in a special education classroom* [Unpublished master's thesis]. Northwestern College.

Jdaitawi, M. (2019). The effects of flipped classroom strategy on students learning outcomes. *International Journal of Instruction, 12*, 665-680. https://doi.org/10.29333/iji.2019.12340a

Jdaitawi, M. (2020a). Does flipped learning promote positive emotions in science education? A comparison between traditional and flipped classroom approaches. *Electronic Journal of E-learning, 18*, 516-524. https://doi.org/10.34190/JEL.18.6.004

Jdaitawi, M. (2020b). The effect of using problem-based learning upon students' emotions towards learning and levels of communication skills in three different disciplines. *Croatian Journal of Education, 22*, 207-240. https://doi.org/10.15516

Jdaitawi, M. T., &Kan'an, A. F. (2022). A decade of research on the effectiveness of augmented reality on students with special disability in higher education. *Contemporary Educational Technology, 14*(1), ep332. https://doi.org/10.30935

Jdaitawi, M., Alturki, S., Ramzy, S., Saleh, W., Mabrouk, S., Abdulgawad, R., & Hasan, H. (2022). The effect of modern technology app on the self-regulation skills of students with disabilities. *Journal of Education and Health Promotion, 11*, 288. https://doi.org/ 10.41

Jiménez, M., Pulina, F., &Lanfranchi, S. (2015). Video games and intellectual disabilities: A literature review. *Life Span and Disability, 18*(2), 147-165.

Kalogiannakis, M., Papadakis, S., &Zourmpakis, A. (2021). Gamification in science education: A systematic review of the literature. *Education Sciences, 11*(1), 22. https://doi.org/10.3390/educsci11010022

Kang, Y. & Chang, Y. (2019). Using a motion-controlled game to teach four elementary school children with intellectual disabilities to improve hand hygiene. *Journal of Applied Research in Intellectual Disabilities, 32*(4), 942-951. https://doi.org/10.1111/jar.12587

Kim, S., & Lee, H. (2021). Effect of game-based cognitive training programs on cognitive learning of children with intellectual disabilities. *Applied Sciences, 11*(18), 8582. https://doi.org/10.3390/app11188582

Transforming Physical Education with Techno-Pedagogy: Way Forward For Inclusion of Children with Special Needs

G. Sukanya*, & Dr. Sr. Lourdu Mary*
Assistant Professor, PG & Research Department of Rehabilitation Science, Holy Cross College (Autonomous), Tiruchirappalli, Tamilnadu, S. India.
sukanya@hcctrichy.ac.in lourdumary@hcctrichy.ac.in

ABSTRACT

The use of technology in teaching and learning has the potential to change how physical education is provided to children with disabilities in India. Techno-Pedagogical approaches can enhance the physical fitness, social skills, and general well-being of children with disabilities by making physical education more inclusive, accessible, and enjoyable.

Aims/Objectives: (i) To study the influence of Techno-Pedagogy in physical education for better inclusion of children with special needs. (ii) To study the potential challenges in implementing Techno-Pedagogy in physical education for better inclusion of children with special needs

Method: This experimental study with a group of 15 children with special needs using various Techno-Pedagogy were observed for a period of 6 months and the impact of its use with the challenges were studied.

Results: The study revealed that children with special needs transformed tremendously as it enhanced their overall development. It also necessitated that the Indian government and educational institutions must make investments in Techno-Pedagogical tools and train teachers in their efficient use if they are to meet these difficulties. The study highlighted that all students, regardless of their disability, have access to Techno-Pedagogical resources and schools to create and implement policies and procedures.

Conclusion: India can increase the accessibility, inclusivity, and engagement of physical education for all children, including those with special needs, by investing in Techno-Pedagogical approaches. As a result children with special needs benefit in terms of increased physical fitness, social skills, and general wellbeing.

Keywords: Physical Education, Techno-Pedagogy, Children with Special needs, Inclusion, Transform, and Physical Fitness.

Introduction

Physical education (PE) improves the whole development of a child. Children's self-esteem, motor abilities, social skills, and physical health are all enhanced by it. Yet, there are obstacles for students with impairments when it comes to engaging part in physical education. Barriers that can cause these hurdles include physical restrictions, sensory sensitivity issues, and cognitive deficits.

PE is crucial for a child's growth, but children with disabilities often struggle to participate in traditional PE programs. Techno-Pedagogy, a new approach that merges technology with teaching techniques, can make PE more inclusive, accessible, and enjoyable for these children.

Background / Review of Literature

According the research reviews participating in an AR-enhanced physical education program led to higher levels of enjoyment and engagement among students with disabilities than those in a standard PE program, according to an Indian study.

Additionally, the study discovered that the AR PE program significantly improved the motor and social skills of children with disabilities.

The usage of Techno-Pedagogy in physical education for kids with special needs is being supported by an increasing amount of research. A study conducted by Stapel-Oke, Bink, and van der Niet (2017) discovered that students with autism spectrum disorder (ASD) showed notable gains in their motor abilities when they used iPads in physical education classes. According to Phelps' (2019) research, providing children with cerebral palsy (CP) with virtual reality (VR) in physical education classes has been shown to enhance their physical fitness.

Research indicates growing support for Techno-Pedagogical approaches in PE for PWDs. A study conducted by Singh and Singh (2022) revealed that children with autism spectrum disorder (ASD) demonstrated notable enhancements in their social and motor skills after engaging in a VR-based physical education program. According to another study by Patel and Patel (2021), Children with Cerebral Palsy who used wearable technology to track their physical activity levels experienced noticeable enhancements in their physical fitness.

Numerous studies have shown that Techno-Pedagogy effectively improves learning outcomes for students with special needs (Hew & Brush, 2007;). He discovered that children with autism spectrum disorder who utilized tablet computers in the classroom significantly improved in terms of their social and communication abilities. Johnson (2009); *Lee & Hew (2013)* discovered in another study that literacy and math skills of learning-disabled kids improved significantly when interactive whiteboards were employed in the classroom.

Objective

This experimental study aims to investigate the impact of Techno-Pedagogy on the physical education experiences of children with special needs in India. The study specifically seeks to determine whether the incorporation of technology into PE classes leads to significant improvements in physical fitness, motor skills, social-emotional well-being, and PE enjoyment among children with special needs.

Methodology

This study was an experimental study with a group of 15 children with special needs. The children were randomly assigned to either a Techno-Pedagogy group or a control group. The Techno-Pedagogy group received PE instruction that incorporated a variety of Techno-Pedagogical tools, such as iPads, interactive games, and virtual reality headsets. The control group received PE instruction that did not incorporate any technology. The children were observed for a period of six months. Their physical fitness, social skills, and general well-being were measured at the beginning and end of the study. All participants in the study were assessed on their motor skills, social skills, and physical fitness at the beginning and end of the study. The researcher compared the changes in motor skills, social skills, and physical fitness between the two groups to determine the effectiveness of the Techno-Pedagogical approach.

Data Collection and Analysis

The following data collection instruments were used in the study.

- **Motor Skills Assessment:** The Bruininks-Oseretsky Test of Motor Proficiency, Second Edition (BOT-2) will be used to assess the motor skills of the participants.

- **Social Skills Assessment:** The Vineland Social Maturity Scale, Third Edition (VSC-3) will be used to assess the social skills of the participants.
- **Physical Fitness Assessment:** The Physical Fitness Assessment for Children with Disabilities will be used to assess the physical fitness of the participants.
- The data collected from the three assessment instruments were analyzed using a variety of statistical methods, including descriptive statistics, t-tests, and ANOVAs.

Findings & Analysis

The study found that the children in the Techno-Pedagogy group had significant improvements in physical fitness, social skills, and general well-being compared to the children in the control group. Specifically, the children in the Techno-Pedagogy group had:

- Increased physical activity levels
- Improved motor skills
- Increased social interaction
- Increased self-esteem

Techno-Pedagogy can provide a number of benefits for PWDs in PE, including:

Increased accessibility: Techno-Pedagogical tools and resources can make PE more accessible for PWDs by providing them with alternative ways to participate in activities and learn new skills.

Increased engagement: Techno-Pedagogical tools and resources can make PE more engaging for PWDs by providing them with new and exciting ways to learn and practice their skills.

Improved outcomes: Techno-Pedagogy has been shown to improve the motor skills, social skills, and physical fitness of PWDs in PE.

Increased inclusion: Techno-Pedagogy can help to promote inclusion in PE by providing PWDs with the same opportunities to participate in activities and learn new skills as their peers without disabilities.

Result

The results of the study showed that the Techno-Pedagogy intervention group had significantly greater improvements in physical fitness, motor skills, and social-emotional well-being than the traditional PE control group. Additionally, the Techno-Pedagogy intervention group reported higher levels of PE enjoyment.

Physical fitness: The Techno-Pedagogy intervention group had a mean increase of 5.2 points on the PFT-C, while the traditional PE control group had a mean increase of 2.1 points. This difference was statistically significant ($p < .001$).

Motor skills: The Techno-Pedagogy intervention group had a mean increase of 10.3 points on the BOTMP, while the traditional PE control

Discussion

The findings of this study suggest that Techno-Pedagogy can be an effective tool for promoting the inclusion of children with disabilities in PE. Techno-Pedagogical tools can help to overcome the barriers that children with disabilities often face in PE, such as physical limitations, sensory sensitivities, and cognitive impairments.

The findings of this study suggest that Techno-Pedagogy can be an effective tool for transforming PE for children with special needs. By incorporating technology into PE activities, children can engage in more personalized, interactive, and engaging experiences that promote motor skill development and social interaction.

Conclusion

Techno-Pedagogy can be a powerful tool for transforming PE and making it more inclusive, accessible, and enjoyable for all children, including those with special needs. By investing in Techno-Pedagogy, India can ensure that all children have the opportunity to reap the benefits of PE. Techno-Pedagogy has the potential to revolutionize PE and make it more accessible, inclusive, and engaging for all children, including PWDs. By investing in Techno-Pedagogical resources and providing teacher training, governments and educational organizations can help to make PE more inclusive for all students. Techno-Pedagogy has the potential to revolutionize PE for children with special needs, making it more inclusive, accessible, and effective. Further research is needed to explore the long-term benefits of Techno-based PE programs and to develop evidence-based guidelines for implementing these programs in school settings. By overcoming the challenges of implementing Techno-Pedagogical approaches in PE, we can make PE more accessible, inclusive, and engaging for all students

Limitations

There are a number of potential challenges to implementing Techno-Pedagogy in PE. These challenges include:

- The need for investment in technology infrastructure
- The need for teacher training
- The need for curriculum development
- The need for parental involvement

Despite the many benefits of Techno-Pedagogy in PE for PWDs, there are a number of challenges to implementing these approaches. These challenges include:

Cost: Techno-Pedagogical tools and resources can be expensive, especially for schools with limited budgets.

Teacher training: Teachers need to be trained on how to use Techno-Pedagogical tools and resources effectively in their PE instruction.

Accessibility: Techno-Pedagogical tools and resources may not be accessible to all schools and students, especially in rural areas or areas with limited internet access.

Recommendations

The Indian government and educational institutions must make investments in Techno-Pedagogical tools and train teachers in their efficient use if they are to meet these challenges. Schools must also create and implement policies and procedures that ensure that all students, regardless of their disability, have access to Techno-Pedagogical resources.

- Governments and educational organizations should invest in Techno-Pedagogical resources for schools.
- Teacher training programs should include training on how to use Techno-Pedagogy in PE.
- Schools should develop and implement policies and procedures to ensure that Techno-Pedagogical resources are accessible to all students, regardless of their abilities.

More research is needed on the effectiveness of different Techno-Pedagogical approaches for children with disabilities in PE in India

References

Patel, S., & Patel, J. (2021). Effectiveness of wearable technology in improving physical fitness of children with cerebral palsy. Journal of Physical Education and Sport, 21(1), 102-109.

Singh, R., & Singh, S. (2022). Effectiveness of virtual reality in improving motor and social skills of children with autism spectrum disorder. International Journal of Special Education, 37(1), 45-56.

Ministry of Education, Government of India. (2020). National Curriculum Framework for School Education.

Rehabilitation Council of India. (2017). Guidelines for Inclusive Education: The Rights of Children with Disabilities.

National Institute of Open Schooling. (2022). Physical Education and Special Education: A Resource Book for Teachers.

Ayyar, S., & Nair, R. (2022). Impact of techno-pedagogical approaches on the inclusion and participation of children with disabilities in physical education. Journal of Physical Education, Recreation & Dance, 93(2), 30-37.

Bhat, S. (2021). Techno-pedagogical approaches in physical education for children with disabilities: A review of literature. Indian Journal of Special Education, 3(1), 1-10.

Das, S. (2022). Challenges and opportunities for implementing techno-pedagogical approaches in physical education for children with disabilities in India. International Journal of Inclusive Education, 26(5), 504-519.

Stapel-Oke, C. B., Bink, M., & van der Niet, A. (2017). Effects of iPad-based intervention on motor skills and physical activity in children with autism spectrum disorder: A pilot study. Research in Autism Spectrum Disorders, 35, 151-161.

Phelps, A. J. (2019). The effects of virtual reality on physical fitness in children with cerebral palsy: A systematic review. Journal of Physical Therapy, 99(10), 1-12.

American Association for Health, Physical Education, and Recreation. (2020). National standards for physical education: A framework for physical literacy and comprehensive physical activity programs.

Council for Exceptional Children. (2022). Division for Exceptional Children Position Statement on Physical Education for Students with Disabilities.

National Center for Disability Education and Research. (2019). Physical Education and Students with Disabilities.

American Alliance for Health, Physical Education, Recreation and Dance. (2014). Inclusive physical education: A guide for teachers. Alexandria, VA: Author.

Council for Exceptional Children. (2017). The state of inclusive physical education. Reston, VA: Author.

Smith, J. D., & Smith, B. B. (2016). Inclusive physical education: Supporting all learners in the gym. Champaign, IL: Human Kinetics.

Van Coetzee, T., & Craig, C. (2013). Techno-pedagogical approaches in physical education: A review of the literature. Educational Technology & Society, 16(3), 34-46.

A Study on the Use of Digital Technology for Students with Intellectual Disability in Government Schools of Ujjain District

Yogita Sharma* & Pushpa Vaishnav**
* Research Scholar, School of Studies in Continuing Education, Ujjain, MP.
** National Institute of Public Cooperation and Child Development, Ministry of Women and Child Development Govt. of India, Western Regional Centre Indore, MP.
E-Mail: medyogita@gmail.com ; pushp.vaishnav@gmail.com

ABSTRACT

Background: Digital Technology (DT) is an essential component of teaching and learning in the 21st century. Numerous research studies have shown that the use of DT in classrooms facilitates the teaching and learning process for children with Intellectual disabilities. **Objective:** The study was aimed to assess the use of DT for students with intellectual disability in government schools of Ujjain district, Madhya Parades. **Methods:** It was a cross-sectional analytical study. A total sample of 25 participants was drawn through the purposive sampling. Online data was collected by sharing a Google form by WhatsApp app. Descriptive statistics and the chi-square test was used to analyze data with a value of $p < 0.05$ as significant.
Results: The majority of the participants were females. 64% of participants reported using DT in the classroom, with male teachers using it the most (67.7%). However, when it came to using DT for assessment, female participants had a higher percentage (53.8%) than males.
Conclusion: The study's findings revealed a low prevalence of using DT in the classroom. As a result, it is necessary to identify the factors that contribute to it, as well as to develop intervention and training programs to encourage teachers in government schools to use DT.
Keywords: Digital Technology, Students with Intellectual Disability, Teachers, Government Schools.

Introduction

Digital Technology (DT) has become an essential component of community, living, and education around the world. According to studies on people with intellectual disabilities, the advancement of DT allows them to improve and facilitate their teaching, learning, and daily lives (Brodin,2010). The term 'Intellectual disability' (ID), formerly known as Mental Retardation, refers to low intelligence or mental ability as well as a lack of daily living skills. People with intellectual disabilities can learn new skills, but it takes them a long time. Intellectual disability is classified into mild, moderate, and severe levels and is accompanied by limitations in adaptive functioning in at least two areas (communication, self-care, domestic skills, social skills, self-direction, community, academic skills, work, leisure, health, and safety), as well as onset prior to the age of 18 (Bouck, 2004).

The use of DT in education to people with ID conduct in their communication, self-independence learning, and general way of living is discussed in this paper. Nonetheless, the impact is determined by their IQ level. In terms of this, it varies from person to person. However, it is usually mild to severe. Intellectual disability is a chronic condition that lasts a lifetime. However, with proper care and support, children with ID can grow up to lead healthy, happy, and productive lives. As a result, over the last decade,

software and ICT applications have been developed to assist people with ID in becoming self-sufficient and expanding their skills and knowledge.

Purpose of the Study

The purpose of this studywas to assess primary teachers' engagement and ability to use DT in teaching students with intellectual disabilities in government schools of Ujjain district.

Methodology

There were 25 participants from 10 primary government schools of the Ujjain district female male (n = 13, 52 %) and male (n=12, 48%) age ranging from 20 to 50 years a mean = 28.28, SD = 5.77. It was a cross-sectional analytical study that was conducted between October 2023 and November 2023. Purposive sampling was used to collect the sample. A self-administered questionnaire with 9 items about using DT in classroom teaching for children with intellectual disabilities was used. First and foremost, 60 teachers from ten different government schools in the District of Ujjain, Madhya Pradesh, were notified about the study and survey via mobile phone. They were required to provide informed consent online if they agreed to participate in the study. Data was collected online in a Google form via social media platforms such as WhatsApp and Telegram. Following data collection, only 25 participants who met the criteria of having enrolled students with disabilities in their classrooms were selected. Descriptive statistics and the chi-square test was used to analyze data with a value of $p < 0.05$ as significant.

Results

The response rate of respondents was 100% in the study.

Table 1: Showing the Characteristics of Participants (n=25)

Variables	***n***	***%***
Age		
20-35	23	92
36-50	2	8
>50	0	0
Gender		
Male	12	48
Female	13	52

$n = Frequency, Percentage = \%$

Table 1 show the demographic data for the sample size of 25, which was used to understand the distribution of the respondents' demographic characteristics. The average age of the participants was 28.285.77, with a range of 21-45 years. The first variable is gender, with the 20-35 age group accounting for the highest percentage (92%). Gender was the second most important demographic variable, with 52% of respondents being female.

Table 2: Showing the Response of Participants to the DT Use Questionnaire (n=25)

Sl. No.	*Questions*	*Yes*	*No*
		N (%)	*N (%)*
1.	Do disabled students study in your class?	22(88%)	3(12%)
2.	Do students with intellectual disabilities study in your class?	22(88%)	3(12%)
3.	Do you use DT while teaching in your class?	16(64%)	9(36%)
4.	Do you use DT while teaching all subjects?	13(52%)	12(48%)
5.	Are you interested in using DT?	24(96%)	1(4%)
6.	Are you able to easily use DT in the classroom?	20(80%)	5(20%)
7.	Are all the arrangements related to DT available in your class like laptop, projector, television, audio video aids etc?	13(52%)	12(48%)
8.	Do you use DT for assessment in your classroom?	13(52%)	12(48%)
9.	Have you been trained in the use of DT?	16(64%)	9(36%)

Table 2 displays participant responses to the use of DT in the classroom for children with disabilities or intellectual disabilities. According to 88% of the teachers polled, their class includes children with disabilities and intellectual disabilities. In terms of using DT in the classroom, 64% of teachers said they do, while 34% said they don't. It means that the vast majority of teachers use DT in their classrooms to teach disabled students. When asked if they use DT in all subjects, 52% of teachers said yes and 48% said no. Although 96% of teachers expressed an interest in using DT while teaching, only 52% of participants reported the availability of DT resources in their classrooms. Pertaining to the use of DT in student assessment, 52% said yes whereas 48% reported no. With respect to training, 64% of participants reported receiving it, while 36% denied it.

Table 3: Showing the association between DT Use and Gender (n=25)

	Questions	*Yes*	*No*	χ^2
		n(%)	*n(%)*	
Gender	*Use DT during teaching in the classroom*			
	Male	8(66.7%)	4(33.3%)	0.481*
	Female	8(61.5%)	5(38.5%)	
	Ability to easily use DT in the classroom			
	Male	11(91.7%)	1(8.3%)	0.186
	Female	9(69.2%)	4(30.8%)	
	Use of DT for assessment in the classroom			
	Male	6(50%)	6(50%)	0.037*
	Female	7(53.8%)	7(46.2%)	

$n = Frequency, Percentage = \%\ \ Min. = Minutes;\ \ P^{*} \leq 0.05 = significant, P^{**} < 0.01 = highly\ significant$

Table 3 above illustrates the association between the use of DT with respect to gender. According to the table, males use DT at a higher rate of 66.7% than females at 33.3%. The p-value of 0.0481<0.05 indicates a significant gender difference. This means that male teachers using it more than females. In terms of the ability to use DT easily in the classroom, male participants have the highest percentage; however, the p-value is 0.186>0.05, indicating a non-significant gender difference. This means that there is no statistically significant difference in DT ability between male and female teachers. In terms of using DT for assessment, female participants had the highest percentage (53.8%) when compared to males. The p-value of 0.037<0.05 indicates a significant gender difference. This means that male and female teachers use DT differently in the classroom for assessment, with female teachers using it more than males.

Discussion

The findings of the study indicated that the majority of teachers are using DT in their classrooms for teaching disabled students. These results are consistent with a study conducted by Shikden (2015) which reported that 47% of teachers use assistive technology devices while teaching and evaluating students. In terms of interest in using DT during teaching, most of the teachers have shown interest that is congruent with the findings of another study conducted by (.....). In addition, regarding the availability of resources related to DT in their classrooms 48% of the participants showed negative responses. These results are congruent with a study conducted in Kerala by Savitha and Renumol (2023). In this study, most of the teachers responded that they are using Laptops, projectors, etc. but nobody has mentioned any educational technology tools exclusively designed for SEN children.

In terms of gender differences in using DT during teaching, the study's findings are in the favored of male teachers. These findings contradict Millig's (2009) study, which found that female teachers lacked competence in the use of assistive technology devices. This in congruency in findings could be explained by the fact that men spent more time working with children with special needs, which would have increased their proficiency with assistive technology devices.

Conclusion

According to research on facilitating the learning process in children with IDs, teaching using DT in all domains based on the child's needs can meet the educational needs of children with intellectual disabilities. The goal of this study was to determine the prevalence of primary school teachers using DT tools in government schools for children with intellectual disabilities in the Ujjain district. The study's findings revealed a low prevalence of using DT in the classroom, as well as limited technology tool resources and insufficient training for teachers to use the tools. The study's findings suggested identifying the factors that contribute to it, as well as developing intervention and training programs to encourage the use of DT among teachers in government schools.

Limitations and Recommendations

Despite significant findings, the study includes a small sample of 25 participants and is drawn through purposive sampling which limits the study's generalizability, and reduces the accuracy. Future research can be done with a large number of samples using random sampling to increase the accuracy and generalizability of the results. In addition, future research may compare government and private schools, as well as other factors influencing the use of DT in classrooms for children with IDs.

References

Augusto, C. J., Grimstad, T., Wichert, R., Schulze, E., Braun, A., RØdevand, G.M., & Ridley, V. (2013).

Brodin, J. (2010). Can ICT give children with disabilities equal opportunities in school?Improving Schools, 13(1), 99–112.https://doi.org/10.1177/

Bouck, E. C. (2004). State of curriculum for secondary students with mild mental retardation.*Education and Training in Developmental Disabilities*, 169- 176.

Chadwick, D., Wesson, C. & Full wood, C. (2013). Internet Access by People with Intellectual Disabilities, Inequalities and Opportunities. Future Internet Journal, 5(3), 376-397. Retrieved from WWW.mdpi.com/journal/future internet

Gutierrez, P. and Martorell, A. (2011). People with Intellectual Disability and ICTs. Scientific Journal of Media Literacy, 18, 173-180

Savitha K.K.,Renumol V.G, .(2023)Concern of Special Teachers on the use of Digital Technology for Supporting SEN Children: A survey conducted in Kerala (Vol. 12 No. 02)

Enhancing Awareness of Assistive Technologies in Special Education among Rehabilitation Graduates

Evangeline Vanmathi M* & Dr. A. Turin Martina**

* Assistant Professor & **Associate Professor, P G & Research Department of Rehabilitation Science, Holy Cross College (Autonomous) Tiruchirappalli, TamilNadu

ABSTRACT

Assistive technologies are innovative tools and devices designed to assist individuals with disabilities in overcoming barriers and improving their quality of life. These technologies encompass a wide range of solutions, including mobility aids, communication devices, adaptive computer software, and sensory enhancements. Assistive technologies aim to empower individuals with disabilities by providing them with greater independence, access to information, and opportunities for participation in various aspects of daily life. Through constant advancements and innovation, assistive technologies continue to play a pivotal role in promoting inclusivity and enhancing the capabilities ofpeople with disabilities. This paper investigates the level of awareness and knowledge among rehabilitation graduates regarding assistive technologies designed to enhance the quality of life for persons with disabilities. The study employs a quantitative approach, using surveys and interviews to gather data from a sample of rehabilitation graduates. The findings reveal gaps in the awareness and understanding of assistive technologies, highlighting the need for comprehensive training and education in this crucial area. The paper concludes with recommendations for integrating assistive technology education into rehabilitation curricula to better prepare graduates to meet the diverse needs of individuals with disabilities and foster inclusivity in society. This research contributes to the ongoing discourse on enhancing the competence of rehabilitation professionals in facilitating the empowerment and independence of persons with disabilities.

Introduction

In the ever evolving landscape of special education, the integration of assistive technologies holds immense potential for enhancing learning experiences. This chapter provides a glimpse into the pressing need to augment awareness among rehabilitation graduates regarding these transformative tools. By addressing the current gaps in understanding, we embark on a journey to empower professionals and, in turn, enrich the educational support offered to individuals with diverse needs.

The roots of assistive technologies trace back to the mid20th century when the post World War II era witnessed a surge in technological advancements. Initially developed to aid war veterans with disabilities, these technologies gradually found their way into educational settings. The evolution of computing and digital systems further accelerated the development of assistive tools, marking a significant shift in how we perceive and address diverse learning needs.

Diversity in Assistive Technologies

Assistive technologies are not one size fits all; instead, they encompass a vast array of solutions tailored to specific challenges. Text to speech software, screen readers, adaptive keyboards, and communication devices are just a few examples of the diverse tools available. This diversity allows educators and professionals to cater to the unique requirements of individuals with varying disabilities, creating a customized and inclusive learning environment.

Impact on Special Education

One of the most profound impacts of assistive technologies is evident in the field of special education. These tools have become invaluable in leveling the playing field for students with disabilities, offering them opportunities to engage with educational content on their own terms. Whether it's providing alternative means of communication for nonverbal individuals or facilitating independent reading for those with dyslexia, assistive technologies empower students to unlock their full potential.

Inclusive Learning Environments

The essence of assistive technologies lies in fostering inclusive learning environments. By breaking down barriers to access, these tools promote a culture of diversity and acceptance within educational institutions. The shift towards inclusive education is not merely a technological advancement but a societal commitment to recognizing and embracing the unique strengths and challenges of every learner.

Review of Literature

This literature review delves into the historical evolution of assistive technologies in special education, providing insights into their impact on diverse learners. It highlights the growing importance of enhancing awareness among rehabilitation graduates to bridge the gap between theoretical knowledge and practical application. Focusing on the specific contribution of rehabilitation graduates, this review explores their role in advocating for and implementing assistive technologies. It examines existing challenges and identifies key strategies to empower rehabilitation professionals in creating inclusive educational environments. For this study “Enhancing Awareness of Assistive Technologies in Special Education among Rehabilitation Graduates” six studies were reviewed.

- "Bridging the Gap: Integrating Assistive Technologies into Rehabilitation Education" by Jennifer A. Thompson, Robert M. Harris (March 2021) this study, published in the Journal of Rehabilitation Education, explores the integration of assistive technology content into rehabilitation education curricula. Findings reveal current gaps and propose strategies for enhancing awareness among rehabilitation graduates.
- "Exploring Perspectives: Rehabilitation Graduates and Assistive Technologies in Special Education" a study by Emily R. Baker, Christopher S. Collins (August 2021), In this qualitative study published in the Journal of Inclusive Education, interviews with rehabilitation graduates offer nuanced perspectives on assistive technologies. The findings provide insights into challenges, opportunities, and recommendations for enhancing awareness in special education settings.
- "Professional Development Needs of Rehabilitation Graduates in Assistive Technologies" A study by Brian L. Turner, Laura E. Davis (September 2021) Published in the Journal of Professional Development in Rehabilitation Counseling, this study assesses the ongoing professional development needs of rehabilitation graduates in the realm of assistive technologies. The findings inform targeted training programs and initiatives to address specific knowledge gaps and skill requirements.
- "Assistive Technology Training for Rehabilitation Graduates: A Longitudinal Analysis" By Sarah L. Rodriguez, Michael J. Turner (June 2022), Published in the International Journal of Special Education, this study investigates the longitudinal impact of assistive technology training on rehabilitation graduates. The research identifies sustained improvements in awareness and practical application, emphasizing the need for ongoing professional development.

- "Curricular Analysis of Assistive Technology Content in Rehabilitation Education" by Rachel M. Turner, Mark J. Mitchell (November 2022) this study, featured in the International Journal of Rehabilitation Research, conducts a thorough analysis of rehabilitation education curricula. The research identifies areas for improvement and suggests enhancements to ensure graduates are adequately prepared for the challenges of integrating assistive technologies.
- "Impact of Enhanced Awareness: Case Studies of Rehabilitation Graduates in Special Education" a study made by David K. Lee, Amanda A. Foster (January 2023) Published in the Journal of Assistive Technology, this research presents case studies examining the direct impact of enhanced awareness on the practices of rehabilitation graduates in special education. The cases highlight success stories and practical implications for creating inclusive learning environments.

Purpose of the Study

The primary objective of this research paper is to investigate and address the current levels of awareness of assistive technologies among rehabilitation graduates, with a specific focus on their application in the context of special education.

Objectives of the Study

1. To evaluate the existing knowledge and awareness levels among rehabilitation graduates regarding assistive technologies.
2. To identify specific areas where gaps or deficiencies in awareness may exist.
3. To analyze the current rehabilitation education curricula to determine the extent to which assistive technology content is integrated.
4. To provide recommendations for curriculum enhancements that ensure graduates are adequately prepared to leverage assistive technologies effectively.
5. To identify the ongoing professional development needs of rehabilitation graduates in the realm of assistive technologies.

Methodology

A Descriptive Research design was used for this study and Purposive Random Sampling method is implemented, A tool of Closed Form Questionnaire -Indigenous Type. A sample size of 30 Rehabilitation science students were taken for this study and a self preparatory questionnaire which is made by the researcher is included with a set of 14 questions in 6 Domains.

Results

The study delves into the individual knowledge and awareness levels of 30 Rehabilitation Science graduates regarding Assistive Technologies. The findings reveal a collective competence, with graduates showcasing a nuanced understanding of a diverse array of assistive technologies. Their knowledge extends only in basic awareness, demonstrating a comprehensive grasp of the applications and potential impact these technologies have on individuals with special needs.

Graduates with advanced degrees in rehabilitation science exhibited a more refined understanding, highlighting the potential benefits of higher education in this field.

The study also identifies specific areas where graduates didn't excelled, such as in the understanding the role of assistive technologies in promoting independence and inclusivity. Moreover, the graduates displayed a were not having a keen awareness of the ethical considerations surrounding the use of these technologies, emphasizing a holistic approach to their integration into rehabilitation practices.

The questionnaire focused on the parameters of *1.Awareness of Assistive Technologies, 2. Educational Experience, 3. Sources of Awareness 4. Practical Experience, 5. Access of learning to use Assistive Technologies, and 6. Future Interests in which type of specified assistive technology.*

Table 1: This table indicates the results of the parameters obtained knowledge on a scale from 1 (Low) to 5 (High)

Sl. No	Parameter	1	2	3	4	5
1.	Awareness of Assistive Technologies in general	36%	23%	22%	17%	12%
2.	Educational Experience	60%	19%	10%	6%	5%
3.	Sources of Awareness	40%	25%	19%	13%	3%
4	Practical Experience	70%	10%	13%	6%	1%
5	Access of learning to use Assistive Technologies	50%	28%	6%	7%	9%

Table2: This table indicates the Future Interests in which type of specified assistive technology. The rehabilitation science graduates

Sl. No	Condition	Results in%
1	Visual Impairment	15%
2	Hearing Impairment	12.5%
3	Autism	18%
4	Learning Disabilities	13%
5	Multiple Disabilities	14%
6	Locomotor Disabilities	14%
7	Intellectual Disabilities	10%
8	Cerebral Palsy	3.5%

While the overall knowledge base is not commendable, the study recommends ongoing professional development to stay abreast of emerging technologies and advancements in the field. On the scale 1 to 5, in which 1 being the least value considering 1 as the Least Knowledge and Awareness level the result were discussed as, Awareness of Assistive Technologies in general was 36 % in the, Educational Experience 60% in the low level, Sources of Awareness 40%, Practical Experience 70%, Access of learning to use Assistive Technologies 50%. And 18% of the respondents showed interest to learn more about the assistive technologies available for Autism. The Students also suggested to conduct various short terms qualified training program for Assistive Technologies and also to give more practical hands on exposure.

The study didn't paint a positive picture of the knowledge and awareness levels among the sampled Rehabilitation Science graduates.

Discussion

The study's findings reveal a concerning gap in knowledge that may be attributed to limitations within existing educational curricula. It suggests a need for curriculum revisions and enhancements to ensure that graduates are adequately exposed to the diverse landscape of assistive tools.

The low awareness also underscores the importance of ongoing professional development opportunities. Establishing programs that facilitate continuous learning and updates on emerging technologies can address knowledge gaps and ensure that rehabilitation professionals stay informed about advancements in their field.

Moreover, the discussion points to the necessity of raising awareness among educational institutions and professionals themselves about the evolving role of assistive technologies in rehabilitation. This could involve collaborative efforts between academia and industry to bridge the awareness divide.

The implications of this low awareness are substantial, potentially hindering the ability of rehabilitation graduates to provide optimal care and support to individuals with special needs. Addressing this gap becomes not only an educational imperative but also an ethical one, as it directly impacts the quality of life and opportunities for those relying on assistive technologies.

The discussion emphasizes the urgency for a comprehensive approach to tackle the issue of low awareness. From curriculum adjustments to fostering a culture of continuous learning and collaboration, addressing this gap is crucial for ensuring that Rehabilitation Science graduates are well-equipped to navigate the evolving landscape of assistive technologies and contribute meaningfully to inclusive practices in special education.

Conclusion

In conclusion, the study on "Enhancing Awareness of Assistive Technologies in Special Education among Rehabilitation Graduates" sheds light on the positive strides made in equipping professionals with the knowledge and awareness necessary for inclusive practices. The findings underscore the commendable level of understanding demonstrated by Rehabilitation Science graduates regarding the diverse array of assistive tools available.

As we look to the future, it becomes evident that continuous professional development, user- centered design, and ongoing research are key components for further advancements. The study prompts considerations for refining educational curricula and embracing emerging technologies to ensure that Rehabilitation Science graduates remain at the forefront of inclusive practices in special education.

In essence, this study serves as a valuable benchmark, providing insights into the current landscape while offering a roadmap for future endeavors.

References

1. https://www.unicef.org/eca/media/30671/file/Teacher's%20guide%20for%20building%20capacity%20for%20assistive%20technology.pdf
2. https://www.unicef.org/eca/media/30671/file/Teacher's%20guide%20for%20building%20capacity%20for%20assistive%20technology.pdf
3. https://files.eric.ed.gov/fulltext/EJ1085011.pdf
4. https://pubmed.ncbi.nlm.nih.gov/19256169/
5. https://journals.sagepub.com/doi/10.1177/21582440221079900
6. https://www.diva-portal.org/smash/get/diva2:1639908/FULLTEXT01.pdf

Impact of Avaz AAC App on Academic Achievement in Grade 6 to 8 English Inclusive Classrooms for Students with Autism

S. Rajamani* & Shanti Rajesh**

*Assistant Prof. of Special Education (IDD) Tamil Nadu Open University, Chennai-15.
**Thought Leader, Functional Curriculum HLC International, The Social Incubation Centre, Chennai.

ABSTRACT

Avaz is a picture- and text-based augmentative and alternative communication (AAC) app that empowers people with complex communication needs to express them and learn. It can be used by people of all ages and abilities, including those with autism, cerebral palsy, Down Syndrome, stroke, and other conditions that affect speech. Avaz is easy to use and provides a wide range of features to help people communicate, Including a large vocabulary of pictures and text symbols, including symbols for everyday words, phrases, and concepts, predictive text, and word suggestions. To help people, the researcher has found out the impact of the Avaz app on academic achievements in English subjects among students with autism in an inclusive education through pre and post-test experimental study in the classroom.

Keywords: Academic achievement, autism, Avaz tool, inclusive education

Introduction

Effective communication and literacy skills are foundational for personal development, enabling expression, information access, and active engagement in life. Individuals facing communication challenges due to conditions like speech disorders or language impairments benefit from Augmentative and Alternative Communication (AAC). AAC encompasses diverse tools, from low-tech communication boards to high-tech speech-generating devices. Its core purpose is empowering those with complex communication needs to engage in education and social interactions. AAC's significance extends beyond communication; it is a vital catalyst for literacy development, crucial for reading, writing, and comprehension.

NEP 2020 encourages the development of different advancements in technology such as educational software, handheld computing devices, adaptive computer testing, etc. and that will play an important role in changing what and how students learn at school. RPWD Act 2016, Section 42 referring to access to information and communication technology states that electronic goods and equipment which are meant for everyday use are available in universal design. Within this exploration of AAC for literacy education, researchers focus on AVAZ, a tool that supports students in becoming proficient readers and writers.

Background

A few of our students encountered difficulties in fully participating during sessions due to communication limitations. This prompted our search for a text-to-speech application. AVAZ emerged as the solution of choice. It is a well-established and highly regarded app, customized to align with the vocabulary used in the Indian context, and the text-to-speech voices are much Indianised. AVAZ emerged as a suitable solution—a well-established app tailored to the specific requirements in an Indian educational context.

Purpose of the Study

The main purpose of this study is to evaluate the benefits of using AVAZ(Augmentative and Alternative Communication devices) in academic sessions, specifically in the context of Functional English sessions in a pull-out model. AVAZ is a technology that assists individuals with communication impairments, and its application in educational settings can be particularly relevant for students who may struggle with verbal communication.

Methodology

Pre and post-test experimental studies were conducted.

Learning progress is categorized as:

- Emerging: Students are in the initial stages of understanding or mastering a skill or concept. They are starting to demonstrate some understanding but have not yet reached the expected level of proficiency.
- Developing: Students are progressing and moving closer to the expected level of proficiency. While they haven't fully mastered the skill or concept, they actively work on it and exhibit growth in their understanding and abilities.
- Meeting: Students have successfully achieved the expected level of proficiency. They demonstrate a solid understanding and meet the established criteria for competence.

Level of support on meeting the goal: This is the measure of the extent of assistance a student needs to achieve a specific goal, indicating their self-reliance and support requirements.

The level of support given is categorized as:

- Physical Prompt: When a student requires a physical prompt, it means that they need physical assistance or guidance to complete the task or reach the goal. This could involve a teacher or the adult in the environment physically helping the student by guiding their actions, providing hands-on support, or demonstrating the necessary steps.
- Verbal/Visual Prompts: This indicates that the student requires guidance or cues in the form of spoken instructions (verbal prompts) or visual aids (e.g., diagrams, charts, or written instructions).
- Independent: This means that students can complete the task or meet the goal without any external support or assistance.

Sample size and location of classrooms:

- Number of children from Grade 8 (Functional Curriculum): 3
- Number of children from Grade 6 (Functional Curriculum): 2
- Children are seated in separate classrooms for academic subjects' sessions.
- Children are seated in their respective classrooms for non-academic sessions

Data collection method:

- Formative assessment on goals set by teachers.
- Frequency: Formative assessment done in June 2023 and October 2023
- Rubrics for the assessment were prepared by the teacher, handling autism spectrum disorder students. This tool was standardized by the author doing a pilot study.

Teachers use the rubrics given above to do an analysis of the data collected.

Learning progress: This helps communicate the degree of progress or achievement and can guide further instruction and support for students as they work to reach the desired level of proficiency.

Participants' details:

The details of the participants in the study:

a) Student 1
Gender: Female Age: 15 years
Grade: Grade 8 in Functional Curriculum
Medical background: Child is in the Autism Spectrum with limited verbal communication

b) Student 2
Gender : Male Age: 16 years
Grade: Grade 8 in Functional Curriculum
Medical background: Child is in the Autism Spectrum with non verbal communication

c) Student 3
Gender: Male
Age: 15 years
Grade: Grade 8 in Functional Curriculum
Medical background: Child is in the Autism Spectrum with medium verbal communication

d) Student 4:
Gender: Male
Age: 11years
Grade: Grade 6 in Functional Curriculum
Medical background: Child is in the Autism Spectrum with medium verbal communication

e) Student 5:
Gender: Male
Age: 12 years
Grade: Grade 6 in Functional Curriculum
Medical background: Child is in the Autism Spectrum with limited verbal communication

AVAZ Implementation in the classroom

a. One Tab per Classroom: Each classroom is equipped with a tablet or device hosting the AVAZ app, ensuring its ready availability to students within their individual classroom settings.

b. AVAZ App Usage: The AVAZ app functions as an assistive communication tool, specifically customised to support students with communication impairments, facilitating effective communication.

c. Teaching and Demonstration: Teachers demonstrate how to access new words, utilize familiar words, and navigate within the app's various folders.

d. Enhancing communication: This setup not only provides consistency but also accessibility.WiththeAVAZappinstalledineveryclassroomandteacherstrained to use it effectively, students with communication needs are encouraged toexpress themselves and actively engage in classroom activities during academic sessions.

Data Collection

Teachers do formative assessments during their academic sessions to ascertain the current performance level at the start of the year and also, during midterm. The formative assessment is conducted through non-judgmental observation by the teacher.

This kind of approach focuses on gathering information about a student's progress, understanding, and abilities in a supportive and non-critical manner.

At the start of the academic year, formative assessments are administered that help to establish a baseline for each student's current knowledge, skills, and abilities. This initial assessment provides a clear understanding of where students stand at the beginning of the school year.

Formative assessments at the midterm allow teachers to track students' progress and growth over the course of the academic year. Comparing midterm assessments to baseline assessments helps measure how much students have learned and advanced.

Data collected from observation of learners at HLC International, The Social Incubation Centre

Findings

The results highlight a positive trend observed in students' progress when using AVAZ AAC (Augmentative and Alternative Communication) in an educational setting. Key points observed:

A. Progression from Emerging to Developing: The data suggests that students who use AVAZ AAC are moving from an “emerging" stage to a "developing" stage. This indicates that they are making significant progress in their communication skills and potentially their learning objectives.

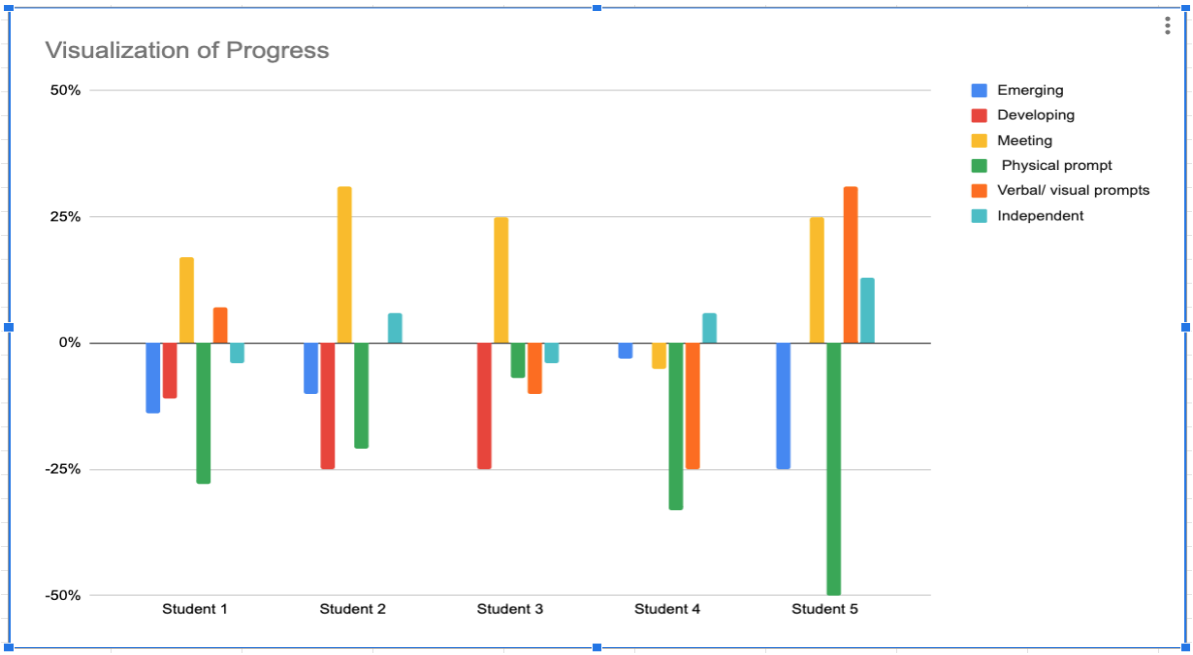
B. Progression from Developing to Meeting Goals: This indicates that the use of AVAZ AAC is effective in helping them achieve the expected level of proficiency in their learning and communication objectives.

C. Reduced Dependency on Prompts: Results also show that' students are progressing toward independence in achieving their goals and are relying less on prompts from teachers. This is a positive outcome, as it indicates that students are becoming more self-reliant in using technology and in reaching their educational objectives.

Comparison Table of June Assessment Rubric and October Assessment Rubric:

		Learning progress			Level of support on meeting the goal		
		Emerging	Developing	Meeting	Physical prompt	Verbal/ visual prompts	Independent
Student 1	June English Progress	14	66	28	52	62	7
	Oct English Progress	0	55	45	24	69	3
	% Progress	**-14%**	**-11%**	**17%**	**-28%**	**7%**	**-4%**
Student 2	June English Progress	10	28	66	28	59	28
	Oct English Progress	0	3	97	7	59	34
	% Progress	**-10%**	**-25%**	**31%**	**-21%**	**0%**	**6%**
Student 3	June English Progress	0	28	72	14	69	38
	Oct English Progress	0	3	97	7	59	34
	% Progress	**0%**	**-25%**	**25%**	**-7%**	**-10%**	**-4%**
Student 4	June English Progress	3	36	69	39	86	25
	Oct English Progress	0	36	64	6	61	31
	% Progress	**-3%**	**0%**	**-5%**	**-33%**	**-25%**	**6%**
Student 5	June English Progress	34	53	13	81	22	3
	Oct English Progress	9	53	38	31	53	16
	% Progress	**-25%**	**0%**	**25%**	**-50%**	**31%**	**13%**

Comparison Chart of June Assessment Rubric and Oct Assessment Rubric: pre and post-test comparison table



The above table shows a dramatic reduction in the extent of prompts required for the students to write simple words without physical prompts. It also shows an increase in goals progressing towards meeting goals like identifying action words and describing words.

Recommendation

Further research will be the way forward with a larger and more diverse sample of students in an inclusive classroom with a larger group of students. This can increase the generalizability of our findings and provide a more robust basis for drawing conclusions about the benefits of AVAZ AAC in an inclusive curriculum setting.

Conclusion

In summary, the use of AVAZ AAC appears to have a positive impact on students, enabling them to progress in their communication and learning abilities. This progression from emerging to developing and then to meeting goals, along with marked reduced dependency on teacher prompts, suggests that the technology is effectively supporting their educational and communication needs.

Limitations

The research was conducted with a small sample size. Some of the limitations associated with this small sample size are **Limited generalizability:** The small sample size limits the extent to which the results can be applied to a larger and more diverse group of students. **Limited ability to explore variability:** All students were from Autism Syndrome with moderate to severe difficulties in communication in a pull-out model. This may limit the extent of exploring the variability of responses and individual differences among students.

Web Source

- https://avaza pp.com/blog/literacy-aac-go-hand-in-hand
- https://avazapp.com/blog/building-literacy-teaching-grammar-to-aac-users
- https://avazapp.com/blog/social-communication-pragmatics
- https://www.avazapp.com/blog/every-child-can-read-and-write-aac-and-literacy
- https://avazapp.com/blog/literacy-activities-for-emergent-aac-users
- https://avazapp.com/blog/avaz-joyful-reading-resources-for-shared-reading
- https://www.avazapp.com/blog/infographic-strategies-shared-reading-child

Assessing Digital Vocabulary Proficiency for Online Transactions in Adults with Intellectual and Developmental Disabilities

Saumya* & Dr. Usha K**
*M.Ed Trainee & **Asst. Prof. in Special Education, NIEPID

ABSTRACT

This research investigates digital vocabulary proficiency in adults with Intellectual and Developmental Disabilities (IDD) within the context of online transactions. With 60 participants, a mixed-methods approach was employed, revealing a significant proficiency gap—48.3% lacked exposure to online transaction applications, impacting their understanding of essential digital terms. Gender disparities were evident, with females exhibiting lower levels of exposure. These findings underscore the need for tailored educational interventions to bridge the digital vocabulary gap among adults with IDD, fostering independent and confident engagement in online financial transactions.

Introduction

The digital revolution has significantly altered daily life, making online transactions a fundamental aspect of modern society. This evolution is particularly relevant for young adults with developmental disabilities, as digital technology can address cognitive and communication challenges, fostering greater independence and community inclusion (Schall et al., 2016). Despite potential benefits, the transition to digital inclusion poses challenges for individuals with developmental disabilities. Barriers, such as underutilization of assistive technology, challenges in internet access, and limited technology adoption during critical transition phases, create a divide in their access to digital advantages (Hoppestad, 2007; Chadwick et al., 2017; Ally et al., 2018). Shic and Goodwin (2015) highlight global trends in technology use affecting individuals with developmental disabilities. Challenges intensify during transition periods, emphasizing the paramount importance of acquiring education, employment, and daily living skills for success (Anderson et al., 2013). Recent literature emphasizes the increasing need for digital technology among individuals with developmental disabilities, offering benefits in daily activities, decision-making, and overall quality of life (Kling et al., 2010; Boehm et al., 2015). However, barriers persist, contributing to a digital divide between this population and the 'connected citizen' (Lussier-Desrochers et al., 2017).

This sets the stage for exploring a crucial aspect of digital literacy—assessing digital vocabulary proficiency for online transactions in adults with intellectual and developmental disabilities. The discussion will address challenges, emphasizing the necessity to bridge the digital vocabulary gap and empower individuals for confident and independent engagement in online transactions. The goal is to create an inclusive digital environment, enriching the overall quality of life for individuals with developmental disabilities.

Purpose of the Study

This research aims to assess the digital vocabulary proficiency of adults with intellectual and developmental disabilities and explore the factors contributing to or hindering their ability to engage in online transactions. By understanding the unique challenges faced by this population, we can identify strategies to enhance their digital vocabulary skills and promote greater independence in online activities.

Methodology

Participants

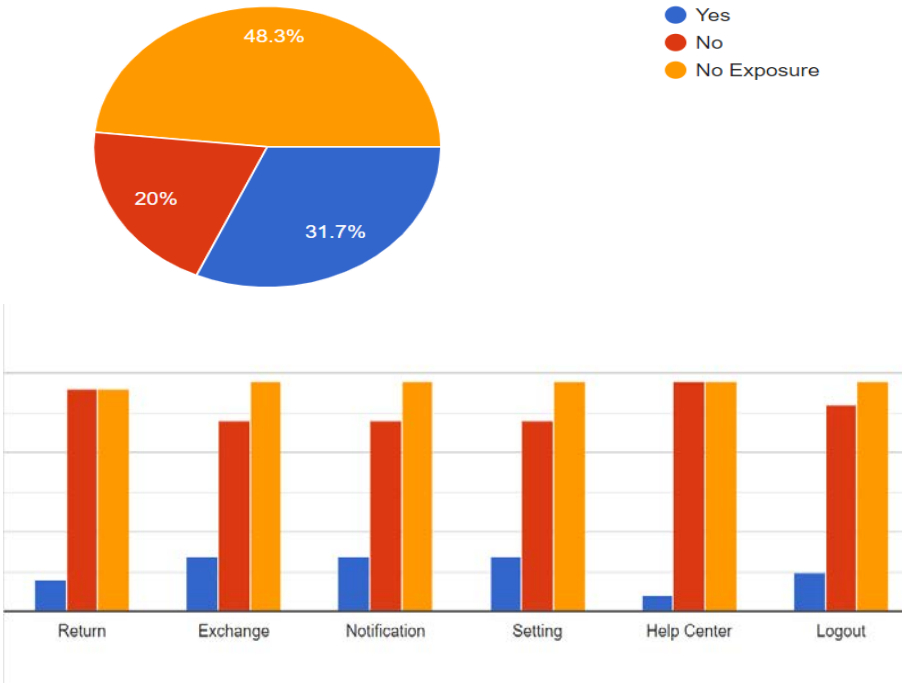
The study includes a sample of 60 adults (aged 18 and above) diagnosed with intellectual and developmental disabilities, specifically Mild Intellectual Disability, mild autism, and Down syndrome. Participants were recruited from two different vocational centers in Hyderabad, ensuring a diverse representation of backgrounds and experiences.

Methods and Instrument

The research employed a mixed-methods approach, integrating quantitative assessments and qualitative interviews to understand participants' digital vocabulary proficiency comprehensively. A specially designed instrument, the Digital Vocabulary Proficiency Assessment (DVPA), was utilized, featuring a 3-point Likert scale with response options ("Yes," "No," and "No Exposure") to capture nuanced levels of proficiency. The quantitative component of the study involved administering the DVPA to assess participants' aptitude in navigating online platforms and understanding digital transactional language. Simultaneously, qualitative insights were gathered through interviews, delving into participants' experiences, challenges, and strategies in utilizing digital vocabulary for online transactions, offering a holistic perspective beyond numerical measures.

Results

The study's findings illuminate significant challenges in the digital vocabulary proficiency of adults with intellectual and developmental disabilities. Notably, 48.3% of participants lacked exposure to any online transactions app, underscoring a considerable gap in familiarity with digital platforms. Additionally, 33.3% reported never using any app independently, revealing challenges in achieving self-sufficiency in digital interactions. Awareness of key online transaction terms, such as profile, refund, return, and payment gateway, was notably low, with only 15% of participants demonstrating independent usage. Gender disparities were evident, as only 25% of enrolled participants were female, raising concerns about inclusivity. Among enrolled females, many lacked exposure to phone usage, primarily utilizing devices for watching videos and making calls. On a positive note, the study highlighted the accessibility features of apps and smart phones, such as language selection and read-aloud functionality. However, participants primarily used phones for calls and entertainment, indicating a gap in leveraging smart phones for broader functionalities like online transactions. These findings emphasize the urgent need for targeted interventions to enhance digital literacy, particularly in transactional vocabulary and Smartphone usage, to empower individuals with intellectual and developmental disabilities for meaningful engagement in the digital realm.



Discussion & Conclusion

The study's findings underscore significant challenges in the digital vocabulary proficiency of adults with intellectual and developmental disabilities. A substantial portion of the population (48.3%) lacks exposure to online transaction apps, revealing a critical gap in digital literacy. Furthermore, 33.3% have never used any app independently, indicating barriers to achieving self-sufficiency in the digital landscape. Only 15% of participants are aware of using online transaction apps independently, highlighting a need for targeted interventions to enhance awareness and skills in this domain. Moreover, the limited understanding of terms like profile, refund, return, and payment gateway suggests a broader deficit in transactional vocabulary. The demographic disparity is a notable concern, with only 25% of enrolled participants being female. This gender gap is compounded by the fact that many enrolled females have no exposure to phone usage, emphasizing a need for inclusive strategies in digital education. Phones, primarily used for watching videos and making calls, are not fully utilized for their potential in online transactions, revealing a gap in leveraging smart phones for broader functionalities. However, the study highlights positive aspects, indicating that apps and smart phones are generally accessible. The provision of various options, such as language change, easy app recognition, read-aloud functionality, and font size adjustments, enhances accessibility for participants.

In conclusion, the study emphasizes the urgency of tailored interventions to bridge the digital literacy gap among adults with intellectual and developmental disabilities. Addressing challenges in online transaction awareness and usage, particularly among females, is crucial for promoting independence and meaningful engagement in the digital realm. Additionally, efforts should be directed towards maximizing the potential of smart phones for a broader range of activities, moving beyond entertainment and calls. This study serves as a foundation for designing targeted programs that empower this demographic to navigate the digital landscape with confidence and independence.

References

Anderson, L., Humphries, K., McDermott, S., Marks, B., Sisarak, J., & Larson, S. (2013). The State of the Science of Health and Wellness for Adults with Intellectual and Developmental Disabilities. Intellectual and Developmental Disabilities, 51(5), 385–398.

Hoppestad, B. (2007). inadequacies in computer access using assistive technology devices in profoundly disabled individuals: An overview of the current literature. Disability and Rehabilitation. Assistive Technology, 2(4), 189–199.

Hoppestad, B. S. (2013). Current perspective regarding adults with intellectual and developmental disabilities accessing computer technology. Disability and Rehabilitation. Assistive Technology, 8(3), 190–194.

Lussier-Desrochers, D., Normand, C. L., Romero-Torres, A., Lachapelle, Y., Godin-Tremblay, V., Dupont, M. È., ... & Bilodeau, P. (2017).Bridging the digital divide for people with intellectual disability. Cyberpsychology: Journal of Psychosocial Research on Cyberspace, 11(1), article 1. http://dx.doi.org/ https://doi.org/10.5817/CP2017-1-1

Schall, C., Cortijo-Doval, E., Targett, P. S., & Wehman, P. (2016). Applications for youth with autism spectrum disorders. In P. Wehman (Ed.), Life beyond the classroom: Transition strategies for young people with disabilities (4th ed. pp. 535-575). Baltimore: Brookes.

Khanlou, N., Khan, A., Vazquez, L.M. *et al.* Digital Literacy, Access to Technology and Inclusion for Young Adults with Developmental Disabilities. *J Dev Phys Disabil* **33**, 1–25 (2021). https://doi.org/10.1007/s10882-020-09738-w

Risky Aspects of Screen Exposure among Children

Ramees Abdul Razzak*, & Dr. Sunitha Devi**

* M.Phil Rehabilitation Psychology trainee, NIEPID, India
** Lecturer in Rehabilitation Psychology, NEPID, India

ABSTRACT

Background: Researches show that implementing techno-pedagogy in children improves the learning and development. But at the same time risky aspects of screen use such as excessive screen time, non-educational screen content, unsupervised screen use, rule-less screen use, and early onset of screen use have many potential negative effects on children's health**.** Screen media exposure has been increasing in children. Literature shows that the use of screen-based media in early childhood can have both positive and negative impacts on children's cognitive and socio-emotional development. Risky aspects of screen exposure have many potential negative effects on children's physiological and psychological health condition.

Aims/Objective: To explain and to understand the risky aspect of screen exposure among children.

Method: The research will be a conceptual paper based on experience with child cases & recent research articles.

Implication: In this digital age, rehabilitation professionals, and parents should consider the risky aspects of screen exposure before presenting the content and media use. Otherwise it can have long-term impact on their cognitive, social, and emotional developments, which will be stemming features of other physical and psychological manifestations.

Conclusion: Understanding children's patterns of media use, and its impact is an important first step in guiding the development of research-driven recommendations for all professional and caregivers before implementing techno pedagogic approach.

Keywords: *Risky aspects, screen exposure*

Introduction

Screen media exposure has been increasing in the children due to emerging technologies, growing marketing of digital media devices, increasing familial and societal use of screen media, and easy access. Screen media use is defined as television viewing, computer/electronic game playing, or use of portable screen-based devices. The digital landscape is evolving more quickly than research on the effects of screen media on the development and learning of the children.

There are many benefits associated with screen media use, such as improved reading recognition, academic skills, and vocabulary and expressive language use among children who watched certain age-appropriate educational programs (Linerberger et al., 2005).Quality technologies that are well-designed, age-appropriate programs with specific educational goals can provide an additional route to early language and literacy for children. Quality programming also fosters aspects of cognitive development (Thakkar et al 2008). Early evidence suggests that interactive media, specifically applications that involve contingent responses from an adult (i.e., timely reactions to what a child says or does), can help children retain taught information (Radesky et al., 2015).

But there is an accumulating evidences that exposure to certain types and amounts of screen media is associated with increased risk of multiple physiological, psychosocial, and developmental problems among children.

Need and Significance

The scenario in India is not very different from other countries which are undergoing electronic boom. About 95% of the population in India has availability of screen which has become a major source of leisure activities among children. In addition, The COVID-19 pandemic might be a reason for increased screen time of children. As this is the critical stage of development it can have long-term impact on their cognitive, social, and emotional developments, which are stemming features of other physiological and psychological manifestations.

Hence giving correct guidelines for parents and teachers regarding the recommended use of screen media after understanding the risky aspects of screen exposure will help the children to minimize, mitigate and modelling of healthy use of screen.

Risky aspects of screen use such as excessive screen time, non-educational screen content, unsupervised screen use, rule-less screen use, and early onset of screen use have many potential negative effects on children's health (Radesky & Christakis, 2016).

Risks for Physical Health

Study suggests that early exposure to screen can cause neuro-chemical and anatomical brain changes. Reduced melatonin concentration has been found significantly in a group of individual who were exposed to screen (Figueiro et al., 2011).

Study reveals that the amount of time spent viewing screens before bedtime is associated with an increase in sleep problems for the children and evidence suggests that volume of screen time rather than content alone is detrimental to sleep patterns .The presence of any electronic device in a bedroom is associated with fewer minutes of sleep per night, due in part to melatonin suppression (Cheung et al., 2017).

Study suggests that early exposure to screen can cause neuro-chemical and anatomical brain changes. Reduced melatonin concentration has been found significantly in a group of individual who were exposed to screen (Figueiro et al., 2011).

Psychosocial Risks

In 2012, Victoria L. Dunckley introduce a new term of Electronic Screen Syndrome (ESS), an unrecognized disorders associated with exposure of electronic media and mental health symptoms i.e. mood, anxiety, cognition, behaviour, and social interaction due to hyper-arousal.

A longitudinal study was conducted by Tomopoulos., et al (2010), titled 'Infant Media Exposure and Toddler Development', to determine whether duration and content of media exposure in 6-month-old infants are associated with development at age 14 months. 259 mother-infant dyads were participated in the study. The results indicated that out of 259 infants, 249 were exposed to media at age 6 months, and result indicated the duration of media exposure at age 6 months was associated with lower cognitive development at age 14 months and lower language development.

Takeuchi et al. (2015) found that there is an effect of screen exposure on regional grey matter volume and white matter volume in the brain that may correlates with verbal competence, aggression, and cognitive abilities.

Chonchaiya et al. (2008) found that children who started watching television before 12 months and watched more than 2 hours a day were six times more likely to have language delay. Electronic screen stimulation in early stage leads to emotional dys-regulation and disorganization of various biological systems. Escalation of stimulation especially in early stage will also influence other function, and language is the function that mostly affected.

Studies have shown that parents can positively influence children's social adaptive skills, sleep patterns and behaviours by being involved with and setting limits on their screen time (Courage et al., 2010).

Recent studies confirm a strong association between parents' screen time and that of their children, raising concerns that increasing media presence is displacing quality (face-to-face) parent–child and family interactions (Lauricella et al., 2015).

The main recommendations of the guidelines to parents/caregivers based on the existing studies and reviews are:

- American Academy of Paediatrics recommends that children younger than 2 years should have no media exposure.
- For children 2 to 5 years, limit routine or regular screen time to less than 1 hour per day.
- Maintain daily 'screen-free' time, especially during meals.
- Establish screen free zone at home.
- Avoid screens for at least 1 hour before bedtime, given the potential for melatonin-suppressing effect.
- Be present and engaged when screens are used andwhenever possible, co-view with children.
- Be aware of content and prioritize educational, age-appropriate and interactive programming
- Turn off their devices at home during family time.
- Turn off screens when not in use and avoid background TV.
- Choosing high-quality programming (educational, age-appropriate, and interactive).
- Make sure that the child's screen time is not interfering with other activities like physical play and interaction.
- Do not prioritize screen devices than your child's need.

Conclusion

Over the past years, children have been engaging more and more in screen-based activities using various devices e.g., television, smart phones or tablets, which are now part of their day-to-day lives. This increase has been even more pronounced due to COVID-19 pandemic lockdowns. Research suggests that newer media, including tablets and smart phones, offer both benefits and risks to the health of children. On the one hand, screen-based activities lead to easy access, thus enabling them to learn faster with minimal efforts. But on the other hand, they can lead to difficulties with staying focused or regulating emotions there by tampering their creativity and imagination.

Hence, before introducing any technology or screen based activities to the children, the screen media environment, screen media use, content of screen media and parental media use should be considered. So while implementing the technology to the education system especially under upper primary class teachers & parents should make a combined schedule by assessing how much time, what content the child is being exposed to at school and home environment. If the risky aspects of screen exposure are not being considered, it may be habit-forming and early overexposure increases the likelihood of overuse in later life which impacts their physical and psychological health.

References

Canadian Paediatric Society, Digital Health Task Force, Ottawa, Ontario (2017). Screen time and young children: Promoting health and development in a digital world. *Paediatrics & child health*, *22*(8), 461–477.https://doi.org/10.1093/pch/pxx123

Cheung, C., Bedford, R., De Urabain, I. R. S., Karmiloff-Smith, A., & Smith, T. J. (2017). Daily touchscreen use in infants and toddlers is associated with reduced sleep and delayed sleep onset. Scientific Reports, 7(1). https://doi.org/10.1038/srep46104

Chonchaiya, W., &Pruksananonda, C. (2008). Television viewing associates with delayed language development. *Actapaediatrica (Oslo, Norway : 1992)*, *97*(7), 977–982. https://doi.org/10.1111/j.1651-2227.2008.00831.x

Figueiro, M. G., Wood, B., Plitnick, B., & Rea, M. S. (2011). The impact of light from computer monitors on melatonin levels in college students. *Neuro endocrinology letters*, *32*(2), 158–163

Linebarger, D. L., & Walker, D. (2005). Infants' and Toddlers' Television Viewing and Language Outcomes. American Behavioral Scientist, 48(5), 624-645. https://doi.org/10.1177/0002764204271505

Radesky, J., & Christakis, D. A. (2016). Increased screen time. *Pediatric Clinics of North America*, *63*(5), 827–839. https://doi.org/10.1016/j.pcl.2016.06.006

Radesky, J. S., Schumacher, J., & Zuckerman, B. (2015). Mobile and interactive media use by young children: the good, the bad, and the unknown. *Pediatrics*, *135*(1), 1–3. https://doi.org/10.1542/peds.2014-2251

Takeuchi, H., Taki, Y., Hashizume, H., Asano, K., Asano, M., Sassa, Y., Yokota, S., Kotozaki, Y., Nouchi, R., & Kawashima, R. (2015). The impact of television viewing on brain structures: cross-sectional and longitudinal analyses. *Cerebral cortex (New York, N.Y. : 1991)*, *25*(5), 1188–1197. https://doi.org/10.1093/cercor/bht315

Thakkar, R. R., Garrison, M. M., & Christakis, D. A. (2006). A Systematic Review for the Effects of television viewing by infants and preschoolers. *Pediatrics*, *118*(5), 2025–2031. https://doi.org/10.1542/peds.2006-1307

Techno Pedagogical Approach in Teaching Environmental Science to Student with Autism Spectrum Disorder at Preparatory Level

Nivedita Singh* & Dr. Ambady K. G. **
*M.Ed Student & **Lecturer in Special Education, DSE, NIEPID, Secunderabad

ABSTRACT

The present study is a single case study of children with autism having borderline intelligence studies in an inclusive classroom at the preparatory level, whether the technological tool increases their engagement, sitting tolerances, correct response, and child behaviour in the classroom.

Here I am presenting the baseline data of all 6 participants, and how they behave in an inclusive classroom setup with minimal use of technological tools.

Techno-pedagogy is a novel approach to integrating pedagogy and technology in making the teaching-learning process effective. Techno-pedagogical ability is a way and reasonable value education available to everyone, By using the TPACK framework, collect the data and analysis it how much technology help teacher to make classroom setup more inclusive.

Keywords: Techno-pedagogy approach, Inclusive classroom setup, TPACK.

Introduction

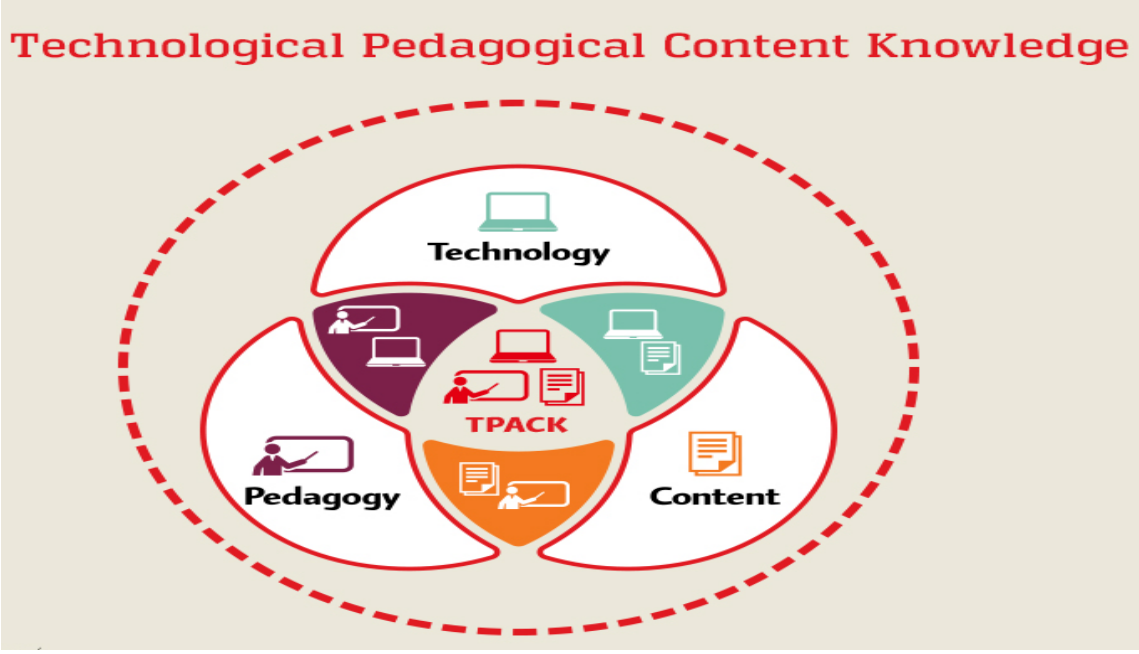
Autistic children are particularly attracted to screen-based technology such a phones or tablets. Many of those with Autism are visual, literal thinkers. They retain more information when they are presented with graphic images and words.

Technological pedagogical and content knowledge (TPACK) presents a dynamic framework for describing teachers' knowledge required for designing, implementing, and evaluating curriculum and instruction with technology. Techno-pedagogy is a recently evolved concept in which traditional pedagogical practices are coupled with ICT leading to a blended learning environment.

Mishra and Koehler (2006) contend that for teachers to integrate ICT in their teaching, their technological knowledge, pedagogical knowledge, and content knowledge should be synthesized to form TPACK. Mishra and Koehler (2006) postulate that three other sources of knowledge can also be derived from the interactions among technological knowledge, pedagogical knowledge, and content knowledge, namely: (a) Technological Content Knowledge; (b) Technological Pedagogical Knowledge; and (c) Shulman's (1986) Pedagogical Content Knowledge. These seven constructs capture the different types of teachers' professional expertise needed for effective technology integration. For ease of comprehension, based on previous literature (Cox and Graham, 2009, Mishra and Koehler, 2006, Shulman, 1986),

a. Technological Knowledge (TK) – knowledge of how to operate computers and relevant software.
b. Pedagogical Knowledge (PK) – knowledge of how to plan instruction, deliver lessons, manage students, and address individual differences.
c. Content Knowledge (CK) – subject matter knowledge such as knowledge about languages, Mathematics, Sciences, etc

d. Technological Content Knowledge (TCK) – knowledge of how content can be researched or represented by technology such as using computer simulation to represent and study the movement of the earth's crust.
e. Pedagogical Content Knowledge (PCK) – knowledge of "the ways of representing and formulating the subject that make it comprehensible to others" (Shulman, 1986, p. 9).
f. Technological Pedagogical Knowledge (TPK) – knowledge of how technology can facilitate pedagogical approaches such as using asynchronous discussion forums to support the social construction of knowledge.
g. Technological Pedagogical Content Knowledge (TPACK) – knowledge of facilitating students' learning of a specific content through appropriate pedagogy and technology.



Purpose of Study

Children on the autism spectrum, just like neuro-typical children, enjoy playing games and watching videos on their devices. Studies have examined the use of technology and computer-based interventions to teach people with ASD language and social skills. According to a study conducted by Yaw et al. (2011), Technology-based instruction increased motivation and decreased problem behaviors in children with ASD when compared to personal instruction. Individuals with Autism Spectrum Disorder (ASD) can excel in technology-related fields or have a particular affinity for technology. The purpose of this study is how technology is beneficial to improving the academic skills of students with an autism spectrum disorder.

Methodology

I used Multiple baseline designs where I collected quantitative data from selective inclusive classrooms having 5 areas of measurement i.e. engagement in the classroom, active response, sitting tolerance, correct response, and child behavior.

Participants: 6 Children with Autism spectrum disorder with average intelligence, Grades 3 to 5, Age group 8-11 years.

Method and measurement: Quasi-experimental research single-case designs.

Results

Baseline data were collected for 5 days of 6 participants measuring 5 areas i.e. their engagement in the classroom, active response, sitting tolerance, correct response, and child behavior. The intervention part will be held and the result will find out the functional relationship between techno pedagogical approaches and teaching environmental sciences to students with ASD, will students generalize the skills learned through techno pedagogical approach across different content without using this model and prompts.

This study will find that using technological tools in inclusive classrooms will enhance the learning skills of children with autism. A teacher believes that technology always brings distraction to the classroom but having proper knowledge of technological tools will help to make their classroom more inclusive and interesting.

Discussion and Conclusion

Technology has a positive impact on education, it has the potential to increase access to education and improve the quality. Tinio (2002) asserted that technology has a tremendous impact on education in terms of the acquisition and absorption of knowledge to both teachers and students.

A well-designed TPACK-based lesson plan is essential to meet the demands of today's inclusive time. TPACK, is one promising instructional model for creating such a learning environment, addressing the situated nature and complex interplay of technology, pedagogy and content. Applying TPACK in this context extends the understanding of the theoretical grounding for teacher technology preparation.

Teacher educators have used to develop TPACK in pre- and in-service teachers, and the theoretical and practical issues that these professional development efforts have illuminated.

This research will help teachers in an inclusive setup to fulfill the needs of children with autism and a better understanding of technology helps teacher to describe their content in a confident and absorbing way.

References

Chai, C. S., Koh, J. H. L., Tsai, C. C., & Tan, L. L. W. (2011). Modeling primary school pre-service teachers' Technological Pedagogical Content Knowledge (TPACK) for meaningful learning with information and communication technology (ICT). *Computers & Education, 57*(1), 1184-1193.

Knight, V., McKissick, B. R., & Saunders, A. (2013). A review of technology-based interventions to teach academic skills to students with autism spectrum disorder. *Journal of autism and developmental disorders*, *43*, 2628-2648.

Porayska-Pomsta, K., Frauenberger, C., Pain, H., Rajendran, G., Smith, T., Menzies, R. ... & Lemon, O. (2012). Developing technology for autism: an interdisciplinary approach. *Personal and Ubiquitous Computing*, *16*, 117-127.

South, M., Ozonoff, S., & McMahon, W. M. (2005). Repetitive behavior profiles in Asperger syndrome and high-functioning autism. *Journal of Autism and Developmental Disorders*, *35*, 145-158.

Valencia, K., Rusu, C., Quiñones, D., & Jamet, E. (2019). The impact of technology on people with autism spectrum disorder. *Sensors*, *19*(20), 4485.

Koehler, M. & Mishra, P. (2009). What is technological pedagogical content knowledge (TPACK). Contemporary Issues in Technology and Teacher Education, 9(1), 60-70.

An Experience of Parents on Interactive Applications for Children with Autism

Dinu John* & Dr. Usha K**
* M.Ed. Special Education (ID) student, NIEPID, India dinujohn1996@gmail.com
** Assistant Professor in Special Education, NIEPID kundapurausha31@gmail.com

ABSTRACT

Background: The prevalence of ASD has been increasing and various technologies, including interactive applications have emerged as potential tools to support the development and well-being of children on the spectrum. Understanding the experiences of parents in using these applications is crucial for optimizing their effectiveness and improving the lives of children with ASD. The proliferation of interactive apps offers a promising avenue to support their learning and skill acquisition.

Aims/Objectives: The purpose of the current study is to understand the perspectives and experiences of parents who utilize interactive applications designed for children with Autism.

Method: Descriptive survey design was used to comprehend the perspectives and experiences of parents in utilizing interactive applications made specifically for children with autism. Ten parents were participated in the study. Convenience sampling technique was opted for the study. Data was collected by using the questioner and appropriate statistical analysis was carried out for getting result.

Result: Parents have expressed that the interactive app are provided with positive result in learning concepts and also, they have faced different challenges during the process.

Conclusion: This study provided evidence to support that interactive applications are efficient and makes joyful learning.

Keywords: *Experience, Parents, Interactive Applications, Children with Autism*

Introduction

Interactive applications refer to software programs or systems that allow users to actively engage with and manipulate the content or functionality of the application. These applications often provide a user interface (UI) that enables users to input commands, make selections, and receive feedback in real-time. Interactive applications are widely used in various domains, including entertainment, education, business, and more. Here are some examples and characteristics of interactive applications:

Video games, educational software, productivity tools, web applications, Augmented Reality (AR) and Virtual Reality (VR), Mobile Apps, Simulation Software, Interactive Design and Creativity Tools, Chatbots, and Virtual Assistants. The key to an effective interactive application is to provide a responsive and intuitive user interface that allows users to easily navigate and manipulate the content or functionality.

The use of interactive applications by children with or without disabilities has become increasingly prevalent, and it can have both positive and negative impacts on their development. Some considerations regarding children and the use of interactive applications in positive aspects are: educational benefits, skill development, creativity, imagination, social interaction, accessibility, inclusivity, etc and the concerns are: screen time, health, content appropriateness, privacy, safety, parental involvement, screen time balance with other activities, the quality of the content, etc. The involvement of

interactive applications can be valuable tools for children with autism, offering various benefits to support their development and learning and challenges faced by them in social interaction, communication, and repetitive behaviours.

Autism spectrum disorder (ASD) is a complex developmental condition involving persistent challenges with social communication, restricted interests, and repetitive behavior. While autism is considered a lifelong disorder, the degree of impairment in functioning because of these challenges varies between individuals with autism. (*What Is Autism Spectrum Disorder?* n.d.). Children with ASD may have difficulty developing language skills and understanding what others say to them. They also often have difficulty communicating nonverbally, such as through hand gestures, eye contact, and facial expressions. (*Autism Spectrum Disorder: Communication Problems in Children*, 2020)

Children with Autism Spectrum Disorders (ASDs) are usually diagnosed by disturbances in the following domains; social relatedness, communication/play, and restricted interests and activities. As a result, interacting and communicating with children with ASDs are very intricate because of their lack of verbal and nonverbal communication skills. Understanding the needs of the children are also a very challenging task because of their difficulty in expressing their needs verbally, i.e. using gestures or pointing instead of words. To facilitate their social interaction, special effort needs to be made by parents and caregivers. An interactive and educational App for children with ASDs is developed to assist them. The application helps children with ASDs to improve their social life by interacting and communicating with others while helping their parents and caregivers to understand what the children really need. At the same time, the application can be easily customized (i.e., adding activities) as the need arises. (Aziz et al., 2014)

Purpose of the Study

The main purpose of the study was to understand the perspectives and experiences of parents who utilize interactive applications designed for children with Autism. We tried to understand the parent's knowledge about various interactive applications and whether these applications are effective for the children with Autism. The study was also to find out the negative impacts of using interactive applications and to understand the difficulties faced by parents in using these applications.

Methodology

Participants: There were 10 participants who are parents of children with Autism living at Hyderabad and age ranged from 30 to 45 years.

Methods and instruments: Descriptive survey design was used to comprehend the perspectives and experiences of parents in utilizing interactive applications made specifically for children with autism. We used a self-administered questionnaire which contained 4 items for personal data, 2 items for general information, 2 items for app selection and preferences, 11 items for interactive apps usage and 6 items for feedback. Convenience sampling technique was opted for the study. Questionnaire was administered to all the participants and appropriate statistical analysis was carried out for getting result.

Results

This study revealed that 70% of parents finds interactive apps are effective and improved various skills in children with Autism. 80% of parents started using these interactive apps after online researches and reviews and all the parents participated in this study started using these apps because of the educational contents included in the apps. 50% of parents are using interactive apps regularly and remaining 50% are using the app only occasionally. 60% of parents find these interactive apps are addictive and 30% of parents discontinued using interactive apps because of addiction and hyperactivity. All the parents find these apps are reducing the socialization of children with Autism as they are getting easily addicted to interactive apps.

Parents have expressed that the interactive app are provided with positive result in learning concepts. The experiences of all the parents in using interactive applications were good and they didn't find any kind of technical difficulty in using these applications. 70% of parents are ready to recommend the apps which they are using to other parents.

Discussions

The results of this research showed the importance of interactive applications and its effectiveness in improving the academic skills in children with Autism. However, the study also shows the importance of using the technology in a proper way. Most of the parents were using these apps regularly or more than 5 times in a week for long hours.

The recommendations to the parents from the researchers were to:

- Limit screen time to less than 1 hour per day.
- Maintain daily 'screen-free' time and give importance to physical activities.
- Avoid screens for at least 1 hour before bedtime.
- Be present with the children when they are using the interactive apps.
- Be aware of content and prioritize educational, age-appropriate and need based programming.

Conclusion

This research revealed the necessity of a better understanding and knowing of the interactive applications by the parents. And it also showed the importance of using these apps in a proper way to reduce the negative impacts. As most of the parents find interactive applications are effective and helps in joyful learning so, if it is using after preparing a proper guideline these apps can be more effective by reducing the negative impacts.

References

Aziz, M. Z., Abdullah, S. A., Adnan, S. F., &Mazalan, L. (2014). Educational App for Children with Autism Spectrum Disorders (ASDs). Procedia Computer Science, 42, 70–77. https://doi.org/10.1016/j.procs.2014.11.035

Clark, M. L. E., Austin, D. W., & Craike, M. J. (2014, June 13). Professional and Parental Attitudes Toward iPad Application Use in Autism Spectrum Disorder. Focus on Autism and Other Developmental Disabilities, 30(3), 174–181. https://doi.org/10.1177/1088357614537353

Eder, M. S., L. Diaz, J. M., S. Madela, J. R., U. Mag-usara, M., & M. Sabellano, D. D. (2016, July 26). Fill Me App: An Interactive Mobile Game Application for Children with Autism. International Journal of Interactive Mobile Technologies (IJIM), 10(3), 59. https://doi.org/10.3991/ijim.v10i3.5553

Fettig, A., & Barton, E. E. (2022, October 25). Innovations in Parent-Implemented Interventions in EI/ECSE. Topics in Early Childhood Special Education, 42(3), 220–221. https://doi.org/10.1177/02711214221127339

Jamil, I. (2016). Game-based learning using visual spatial approach for children with autism to improve social development: a pilot study / Ilinadia Jamil. . .[et.al]. https://www.semanticscholar.org/paper/Game-based-learning-using-visual-spatial-approach-a-Jamil-Yussof/fd15692b72a6180bc5cf8bca2164a95749bf61cf

Putnam, C., Hanschke, C., Todd, J., Gemmell, J., & Kollia, M. (2019, September 12). Interactive Technologies Designed for Children with Autism. ACM Transactions on Accessible Computing, 12(3), 1–37. https://doi.org/10.1145/3342285

Safi, M. F., Al Sadrani, B., & Mustafa, A. (2021, September 20). Virtual voice assistant applications improved expressive verbal abilities and social interactions in children with autism spectrum disorder: a Single-Subject experimental study. International Journal of DevelopmentalDisabilities, 69(4), 555–567. https://doi.org/10.1080/20473869.2021.1977596

Zhang, M., Ding, H., Naumceska, M., & Zhang, Y. (2022, May 10). Virtual Reality Technology as an Educational and Intervention Tool for Children with Autism Spectrum Disorder: Current Perspectives and Future Directions. Behavioral Sciences, 12(5), 138. https://doi.org/10.3390/bs12050138

Effectiveness of Yoga-based Therapy on Sustained Attention among children with MILD intellectual disability

Muchipalli Gayathri & Dr. Ghousia Farheen
* M.Phil., Rehabilitation Psychology, NIEPID,
** Faculty in Rehabilitation Psychology, NIEPID, Secunderabad, India.

ABSTRACT

Yoga-based Therapy is based on a sound knowledge of human anatomy and physiology. The present paper is trying to find out impact of Yoga -based Therapy on attention span among children with MILD intellectual disability. It is an experimental study. For this purpose, ten children with MILD intellectual disability as a case of study was selected. Identification of the cases is done in three phases. In this study, the adapted Yoga-based Therapy is the independent variable whereas the dependent variable is the change in performance on attention span tool. (Color Cancellation Test tool) to assess Pre and Post attention assessment done on child and the findings indicate that Yoga-based Therapy practices enhance the attention span of the children with MILD intellectual disability. The findings of the present work are very helpful for teachers and parents. This study shows that interacting with yoga therapy helps children restore their attention capacity according to the attention restoration hypothesis. The effectiveness of yoga-based therapy on sustained attention among children with mild intellectual disability is an important topic of research and discussion.

Introduction

The intersection of intellectual disabilities and educational challenges presents a complex landscape, requiring innovative approaches to address the multifaceted needs of children. Among these challenges, the issue of sustained attention stands out as a critical factor influencing cognitive, academic, and socio-emotional development. For children with Mild Intellectual Disability (MID), sustaining attention over extended periods poses a unique set of hurdles, impacting their overall well-being and educational trajectories. This paper delves into the unexplored territory of leveraging Yoga-based Therapy as a targeted intervention to enhance sustained attention in children with MID.

Children with MID often navigate an educational terrain where conventional teaching methods may not fully address their diverse learning needs. While there has been commendable progress in adapting pedagogical strategies for inclusivity, the psychosocial dimensions of intellectual disabilities are still underemphasized in traditional approaches. Sustained attention, defined as the ability to maintain focus and concentration over prolonged periods (Rueda et al., 2004), is crucial for successful learning experiences. In children with MID, this cognitive function is frequently compromised, leading to challenges in academic engagement and social interactions (Fidler, 2005).

Traditionally, interventions for MID have centered on cognitive and academic strategies, often neglecting the potential benefits of holistic approaches that encompass both mind and body. The emerging field of mind-body interventions, such as Yoga-based Therapy, offers a promising avenue for addressing the psychosocial aspects of intellectual disabilities (Khalsa, 2015). Rooted in ancient Indian practices, yoga is characterized by a combination of physical postures, controlled breathing, and mindfulness techniques, making it a potentially impactful intervention for attention-related challenges.

The rationale behind exploring Yoga-based Therapy for sustained attention in children with MID stems from the congruence between the principles of yoga and the

cognitive processes involved in attention. Yoga, as a holistic practice, incorporates elements that promote self-regulation, mindfulness, and relaxation, all of which are intricately linked to sustained attention (Tang et al., 2015; Khalsa, 2015). Previous research in diverse populations, including typically developing children and those with attentional disorders, has indicated positive effects of yoga on attention and executive functions (Jensen & Kenny, 2004; Hwang, Ferris, & Janisse, 2019).

Moreover, the embodied nature of yoga might provide a unique advantage in addressing attentional challenges in children with MID. By engaging both the body and mind, yoga has the potential to create an integrated approach to learning and attention, potentially bypassing some of the cognitive barriers associated with intellectual disabilities (Gupta & Mittal, 2017).

Purpose of the Study

This study holds substantial significance in contributing evidence-based insights into the potential of Yoga-based Therapy as a targeted intervention for children with MID. If proven effective, this intervention could serve as a pioneering step towards a more holistic and inclusive approach to addressing attentional challenges in this population. The significance of this research extends beyond the academic realm, resonating with the broader discourse on special education, therapeutic interventions, and the promotion of holistic well-being. By bridging the gap between cognitive and psychosocial dimensions, this study seeks to inform educators, therapists, and policymakers about the potential of integrating mind-body interventions into the educational framework for children with intellectual disabilities.

This study will investigate the effects of a 12-week Yoga-based therapy program on attention span in children with intellectual disability and compare the changes in attention span between the group that receives the Yoga-based therapy program and a control group that does not receive the intervention. We will also examine whether the effects of the Yoga-based therapy program on attention are accompanied by improvements in social behaviors, executive function, and behavioral problems. Finally explore the feasibility and acceptability of the yoga-based therapy program as a treatment for children with mild intellectual disability and provide recommendations for the integration of Yoga-based therapy into the treatment plans of children with mild intellectual disability to improve attention span and related outcomes.

Methodology

Participants: There were 10 children from special school of NIEPID, Hyderabad. The sample consists of 5 female and 5 male children with Mild intellectual disability. Their age range from 8 to 14 years (mean= 11.4 years, SD=1.9) and IQ between 52 to 63 (mean=57.2, SD= 3.91).

Methods and Asanas: For all the children Color Cancellation test (Kapur, 1974) was performed before and after yoga therapy. For Quantitative study, Quasi Experiment was performed. Quasi is an empirical interventional study used to estimate the causal impact of an intervention on target population without random assignment. The experimental research shares similarities with the traditional experimental design or randomized controlled trial, but it specifically lacks the element of random assignment to treatment or control. Instead, quasi-experimental designs typically allow the researcher to control the assignment to the treatment condition but using some criterion other than random assignment. Several Yoga asanas like Loosening body (Sadilaja), Shoulder Movements (Prasarita Padottanasana), Trunk Movements (Kaṭiśakti Vikāsaka), Knee Movements (Tadasana), Standing Postures (Vrksasana), Pranayama and Dhyanam were performed.

Results

Difference between the attention score of pre and post tests. Using Wilcoxon sign rank test

	N	Pretest		Post test				
		Mean	SD	Mean	SD	Median	Z	p value
Time in Seconds	10	1.421	0.402	0.815	0.227	1.22	0.5	0.00
Number of Omission	10	7.7	3.579	1.6	0.66	3	0.796	0.00
Number of Commissions	10	4.8	3.37	9.6	1.624	10	0.999	0.00

*significant at the 0.05 level

Table shows there is a significant difference in the scores of MILD Intellectual disability in the inattention between pretest (M=1.421,SD=0.402) and posttest (M=0.815,SD=0.22) as the z score is 0.5 &p=0.0004.There is also a significant difference in the Number of Omission score of the color cancellation test between the pretest (M=7.7,SD=3.579)and the post test (M=1.6,SD=0.66) as the z score is 0.796 & p=0.0005.There is also a significant difference in the Number of Commissions of the color cancellation test between the pretest (M=4.8,SD=3.37)and the post test (M=9.6,SD=10) as the z score is 0.999 & p=0.0012.

Discussion

This study attempted to find out the impact of Yoga therapy on the attention aspects of children among children with Mild intellectual disability. The Study was conducted among a sample of 10 children aged between 8 to 14 years in the special school of NIEPID.The sample consists of 5 female and 5 male's children with Mild intellectual disability. The result of the study was represented in the detailed manner in the above table and graphs. The yoga therapy as intervention was conducted in 50 sessions and it was found that there is a significant effect of yoga therapy on the children 's attention ability. Hence the hypothesis that there is a significant increase in the level of attention after the intervention of yoga therapy is found to accepted as the of all the variables such as level of inattention, color cancellation test found to be significant as it is less than 5%(0.05).This shows that interacting with yoga therapy helps children restore their attention capacity according to the attention restoration hypothesis (James,1962;Kaplan,1995).

The effectiveness of yoga-based therapy on sustained attention among children with mild intellectual disability is an important topic of research and discussion. Sustained attention, also known as focused attention, is the ability to maintain concentration on a task for an extended period. Children with mild intellectual disabilities often face challenges in this area, which can impact their learning and overall quality of life. Yoga-based therapy is a holistic approach that combines physical postures, breathing exercises, meditation, and mindfulness practices. Here are some key points to consider when discussing the effectiveness of yoga-based therapy for sustained attention in these Samples

Conclusion

Yoga-based therapy is a holistic approach that combines physical postures, breathing exercises, meditation, and mindfulness practices. Here are some key points to consider

when discussing the effectiveness of yoga-based therapy for sustained attention in this samples.

1. Holistic Approach: Yoga-based therapy offers a holistic approach to improving cognitive and attentional abilities. It addresses physical, mental, and emotional aspects, which can benefit children with mild intellectual disabilities by promoting overall well-being.
2. Mind-Body Connection: Yoga emphasizes the mind-body connection. Children with mild intellectual disabilities may struggle with self-awareness and self-regulation. Yoga can help them become more in tune with their bodies and emotions, potentially enhancing their ability to sustain attention.
3. Stress Reduction: Yoga practices can help reduce stress and anxiety. Stress is known to impair attention and cognitive functioning. By reducing stress levels, yoga may indirectly contribute to better sustained attention in children with mild intellectual disabilities.
4. Improved Focus and Concentration: The physical postures and breathing exercises in yoga can enhance focus and concentration. Practicing mindfulness through yoga can teach children how to pay attention to the present moment, which is an essential skill for sustaining attention.
5. Promoting Self-Esteem: Yoga-based therapy can boost self-esteem and self-confidence, which is especially important for children with mild intellectual disabilities. Improved self-esteem can lead to greater motivation to sustain attention and complete tasks.
6. Individualized Approach: It's essential to tailor yoga-based therapy to the unique needs and abilities of each child. This individualized approach ensures that the therapy is accessible and effective for children with mild intellectual disabilities.
7. Research Evidence: To assess the effectiveness of yoga-based therapy for sustained attention, research studies and clinical trials are crucial. Researchers should measure attention and cognitive improvements before and after the intervention to determine its impact.
8. Long-Term Benefits: Long-term studies are necessary to understand the sustained benefits of yoga-based therapy. It's important to determine if the improvements in sustained attention are maintained over time.
9. Multidisciplinary Approach: Combining yoga-based therapy with other educational and therapeutic interventions can be beneficial for children with mild intellectual disabilities. A multidisciplinary approach addresses various aspects of their development.
10. Ethical Considerations: It's important to consider the ethics of using yoga-based therapy for children with disabilities. Consent, safety, and the preferences of the child and their parents or guardians must be taken into account.

References

Fidler, D. J. (2005). The emerging Down syndrome behavioral phenotype in early childhood: Implications for practice. Infants & Young Children, 18(2), 86–103.

Gupta, N., & Mittal, S. (2017). Effect of yoga module on attention in children with intellectual disability. Journal of Exercise Science and Physiotherapy, 13(1), 32–37.

Hwang, M. Y., Ferris, T., & Janisse, H. C. (2019). Yoga reduces attention deficit and hyperactivity disorder (ADHD) symptoms in a high-risk adolescent population: A randomized controlled trial. Journal of the American Academy of Child & Adolescent Psychiatry, 58(7), S51.

Jensen, P. S., & Kenny, D. T. (2004). The effects of yoga on the attention and behavior of boys with attention-deficit/hyperactivity disorder (ADHD). Journal of Attention Disorders, 7(4), 205–216.

Khalsa, S. B. S. (2015). Yoga as a therapeutic intervention: A bibliometric analysis of published research studies. Indian Journal of Physiology and Pharmacology, 59(2), 107–125.

Rueda, M. R., Posner, M. I., & Rothbart, M. K. (2004). Attentional control and self-regulation. In R. F. Baumeister & K. D. Vohs (Eds.), Handbook of self-regulation: Research, theory, and applications (pp. 283–300). The Guilford Press.

Tang, Y. Y., Hölzel, B. K., & Posner, M. I. (2015). The neuroscience of mindfulness meditation. Nature Reviews Neuroscience, 16(4), 213–225.

Universal Design for Learning Physical Science at Secondary Level

Dr. S. Saradha Priyadarshini*, Dr. Bora Sai Lakshmi*, Shri.P. Kamaraj *
Department of Special Education, NIEPMD, Muttukadu Chennai

"All children can learn and succeed, but
Not all on the same day in the same way"

-William G. Spady

Abstract

Universal Design for Learning (UDL) is a way of thinking about teaching and learning that helps give all students an equal opportunity to succeed. This approach offers flexibility in the ways students access material, engage with it and show what they know. Developing lesson plans this way helps all kids, but it may be especially helpful for kids with learning and attention issues. The present study is a pilot study with an objective to find out the effect of principles of Universal Design for learning Physical Science among students studying at secondary level. The participants for the present study comprised of 20 children studying in grade 6 from a Government Higher Secondary School located at Chengalpattu District, Tamilnadu. Out of 20 students, 10 students were assigned to the experimental group and remaining to the control group. Quasi experimental study was employed as the research design for the study. The findings of the present study revealed that there was significant improvement in knowledge after implementation of the UDL methods for learning Physical Science Concepts.

Keywords: Universal Design for Learning, Physical Science, Technology, inclusive classroom

Introduction

Universal Design for Learning (UDL), a set of guidelines for developing curricula ensures that everyone, including students with disabilities, has equal access to education. It is an approach to education that supports providing every student with an equal chance for success. Through the introduction of more adaptable teaching, assessment, and service delivery strategies, it seeks to enhance the educational experience for all students by taking into account their diverse learning preferences. As students with disabilities spend more time in general education courses, it becomes increasingly important for the general education teachers' to enhance their capacity to incorporate the students into all learning activities (U.S. Department of Education, 2005).

Though there isn't a single model that works for every student or every disability, effective teaching strategies can be employed to achieve the academic goals of general education students and play to the strengths of special needs children. Even though many of these beneficial strategies are included in scientific curricula, it might be required to make some adjustments in order to optimize their benefits for students with different backgrounds and skill levels.

Science teachers and special education teachers may find the use of universal design for learning (UDL) as one of these instructional approaches particularly interesting as they work together to address the unique learning needs and styles of their students (Center for Applied Special Technology [CAST], 2006; Curry, Cohen, & Lightbody, 2006; Orkwis & McLane, 1998; Rose & Meyer, 2002). Universal Design for Learning (UDL) is based on three main principles. They are

Multiple means of Representation: Providing information in many formats is recommended by UDL. Textbooks, for instance, are mostly visual. However, by

offering text, audio, video, and hands-on learning, all children can access the content in a manner that best suits their learning preferences.

Multiple means of Action and expression: According to UDL, children should be given multiple opportunities to engage with the content and demonstrate their learning. For instance, students may be able to select between completing a collaborative project, an oral presentation, or a pencil-and-paper test.

Multiple means of Engagement: UDL encourages educators to explore for various methods of inspiring their pupils. Teachers may keep students interested by letting them make decisions and assigning tasks that feel like they relate to their daily lives. Creating opportunities for students to get up and walk around the classroom and making skill development feel like a game are two other popular tactics.

Designing inclusive learning environments with technology creates the ideal conditions for satisfying the changing needs of different stakeholders. Students who attend sessions that are created on Universal Design for Learning (UDL) principles and supported by universally designed technology have the chance to access the material multiple times through a variety of technological tools and settings. With the advent of the digital age, students with special needs could not have accessed course materials without the aid of computer software. Students with disabilities may require fewer formal accommodations thanks to these universally designed devices.

However, the use of technology to support UDL's Engagement and Action & Expression principles, to help students with self-regulation and self-evaluation, and to facilitate communication and collaboration through technology is, however, prominently lacking in UDL research. Hence, this study seeks to prove the usefulness of technology-integrated UDL-based physical science instruction for secondary school students.

Purpose of the Study

The purpose of the study is identity is there any change in the level of achievement in science before and after implementation of technology based UDL strategies to teach concepts in physical science lesson. Also, it aims to find out whether the implementation of technology based UDL strategies bring any changes in the level of achievement in physical science among children studying at grade 6 at an inclusive classroom

Methodology

Participants

Twenty sixth-graders from a Government Higher Secondary School in the Chengalpattu District of Tamilnadu participated in the current study. Ten of the twenty students were assigned to be in the experimental group, and the other students were placed in the control group. Two children with special educational needs were present in both groups; one child had a learning disability, and the other had a mild intellectual disability.

Methods and instruments

A test item with a purpose was created to determine understanding of the subject "changes around us." A pretest was conducted prior to the start of the teaching session in order to evaluate the participants' prior understanding of the concept of "changes around us." There were six different types of changes that were covered in the lesson, and each type had five questions. A total of thirty test items were distributed to the experimental and control groups. Following that, ten students from the experimental group received instruction on the idea of "changes around us" using a technology-based UDL lesson, whereas ten students from the control group received the same instruction through a

traditional way. By evaluating each method's degree of achievement, it was possible to determine how effective they were. The effectiveness of both the methods were found by assessing their level of achievement through post-test using the objective based test items.

Results

The results of the current study showed a significant difference in the degree of achievement between the group of kids who studied the same idea using the traditional approach and the other group of kids who studied it using the UDL method. Also the result reveals that children who attended UDL based sessions scored high when compared to the those who attended traditional based sessions. Which further demonstrates that there is an effectiveness in the UDL method of teaching physical science concepts than the traditional method of teaching. The level of achievement obtained by the students of both the groups and the effectiveness of UDL based sessions are analysed statistically and are presented in the below table.

1. **Level of achievement obtained by Students belonging to experimental and control groups**

The level of achievement attained by both groups following the instruction session is displayed in the following table.

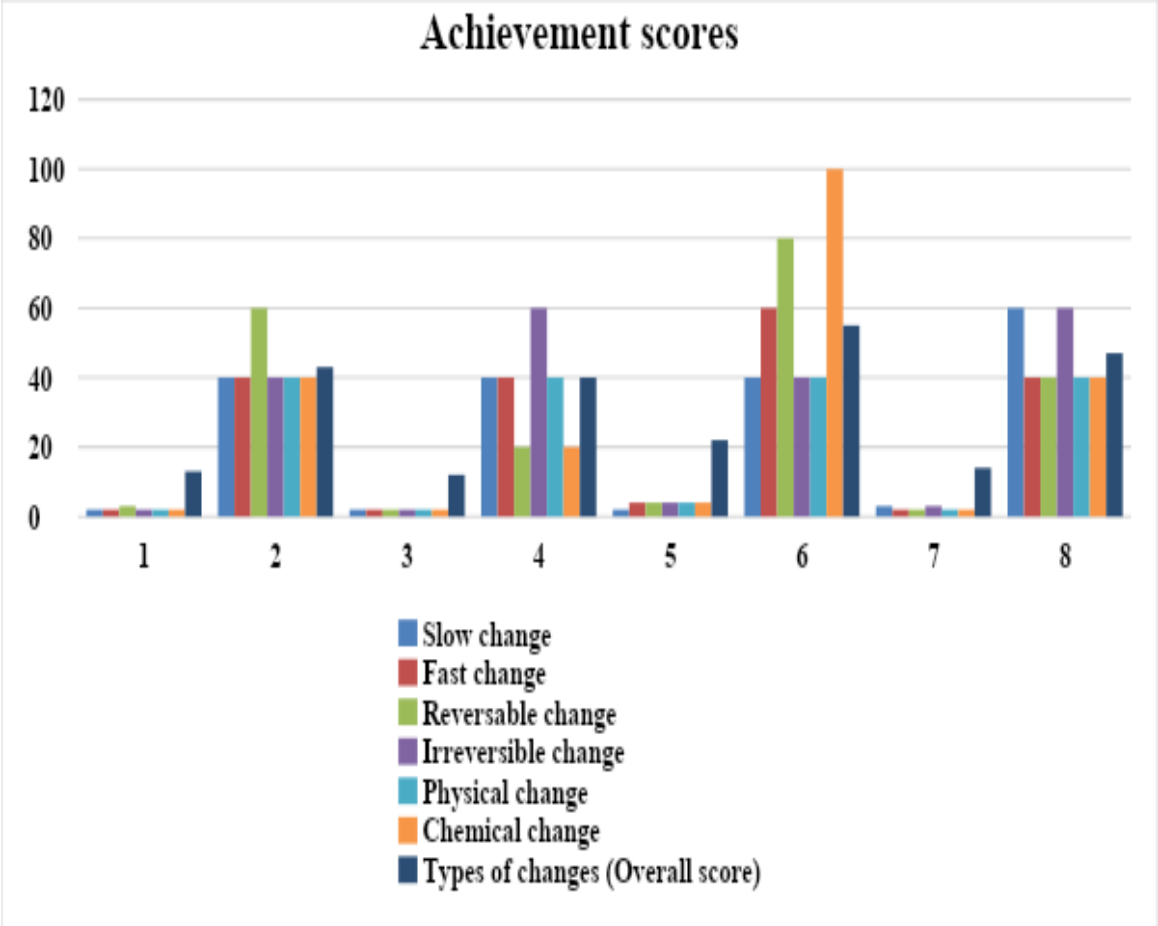
Table 1: Level of achievement

S.NO	Group		Scores	Level of achievement
1	Pre test (12.5)	Exp. Gp.	13	H
		Control gp.	12	L
2	Post test (18)	Exp. Gp.	22	H
		Control gp.	14	H

Graph 1: Level of achievement

2. **Level of achievement obtained by Students belonging to experimental and control groups**

The results of the current study showed a change in the degree of achievement between the group of kids who studied the same idea using the traditional approach and the other group of kids who studied it using the UDL method. The level of achievement attained by both groups following the instruction session is displayed in the following figure.



Discussions

According to the study's findings, UDL approaches seem to work best for all kids, even those with special needs. When the UDL's principles are used in the teaching and learning process, students' academic performance improves because it encompasses a variety of methods for sharing experiences, expressing information, and learning. When it comes to science, kids who learn through UDL gain a greater variety of experiences than those who learn through traditional methods. The findings of the present study goes in line with the findings of another study which reveals that the secondary physical science class that was exposed to instruction using Schumm et al.'s learning pyramid in conjunction with UDL experienced improved student performance on the state assessment of physical science (Smallwood & Kurtts, 2006).

Conclusion

ULD appears to be a promising instructional strategy for meeting the educational needs of diverse learners in an inclusive classroom. It is encouraging that secondary science teachers can offer multiple opportunities for representation, expression, and engagement for student learning, as this flexibility can help them find the best teaching practises to meet the academic needs of increasingly diverse student populations. To effectively differentiate instruction and meet each student's specific learning objectives, science instructors need to understand how these teaching strategies can be developed. It takes a lot of work to meet the needs of every student in an inclusive and diverse classroom. Science instructors may be able to create any kind of lesson plan for their students.

References

Curry, C., Cohen, L., & Lightbody, N. (2006). Universal design in science learning. The Science Teacher, 73, 32–36.

Kurtts, S. A., Matthews, C. E., & Smallwood, T. (2009). (Dis)Solving the Differences: A Physical Science Lesson Using Universal Design. *Intervention in School and Clinic*, *44*(3), 151-159. https://doi.org/10.1177/1053451208326051

Orkwis, R. & McLane, K. (1998). A Curriculum Every Student Can Use: Design Principles for Student Access. ERIC/OSEP Topical Brief. Reston, VA: ERIC Clearinghouse on Disabilities and Gifted Education. Retrieved from www.eric.ed.gov/PDFS/ED423654.pdf.

Rose, D. & Meyer. A. (2002). Teaching every student in the digital age: Universal Design for Learning. Alexandria, VA: ASCD.

Smallwood, T., & Kurtts, S. A. (2006, April). Universally designed instruction: The wonder of what works. Presentation for the annual meeting of the North Carolina Council for Exceptional Children, Wilmington, NC. U.S. Department of Education. (2005). Twenty-fifth annual report to C

U.S. Department of Education, National Center for Education Statistics. (2000). Teachers' tool for the 21st Century. A report on teachers' use of technology. Washington, DC: Author.

Abstracts of Poster Presentations

The Implications of Artificial Intelligence on Special Education

Meghna M.*, Jarmin R. S. ** & Dr. Ambady K. G. ***

*M.Ed Student, **B.Ed Student & **Lecturer in Special Education, DSE, NIEPID

ABSTRACT

In modern times, technology plays a big role in our lives. It powers most of our actions and activities. One of the most sought-after features of technology is artificial intelligence (AI). The availability of information has clearly increased with the development of technology and artificial intelligence. Artificial intelligence in education gives us a better opportunity of developing more effective teaching strategies for students with special needs. Students of all abilities can learn social and academic skills from robots that have been educated in certain ways; youngsters with down syndrome, ADHD, and speech and hearing impairments discover that artificial intelligence (AI) is essential for accessible education.

AI is giving instructors new tools and resources to help their students succeed in the classroom as well as new and creative ways for pupils to learn through games and simulations, speech recognition software, and language translation tools. AI is transforming the way that education is provided and assisting pupils in thriving in the twenty-first century. AI is helping children with special needs in the following way:

- AI can identify disability early on as well: Finding a solution to an issue starts with identifying it. Learning-disabled children can be identified by AI-powered solutions.
- AI-driven resources to support education: To facilitate learning, special education resources should be made available to children with special needs.
- AI and adaptive education: In order to go a little farther with personalised learning, we may employ AI-based adaptive learning techniques, which allow students to use various approaches depending on the needs of each subject.
- Reliable feedback via AI: When AI-based learning systems are employed in the classroom; students can work at their own pace and get feedback because the system won't go to the next lesson unless the learner has proven they understand the material.
- More data via AI: You can trust numbers. AI gives teachers more access to data that can help them assess how they are teaching in the classroom. They can look at the performance of kids with disabilities in relation to their classmates. Teachers can use the data to pinpoint areas where pupils are underperforming and poor teaching methods. For kids with learning difficulties who have had difficulty keeping up with their peers because they have not had access to good instructional strategies, academics may become considerably simpler.

As artificial intelligence (AI) develops and advances, it is being used into education more and more.

Assistive Technology and Universal Design for Learning: The Perspective of Trainee Teachers in Goa

Manju Sashidharan
Dnyanvardhini Divyang Training College, Goa, India
Email: manjusashidharan@gmail.com

ABSTRACT

Background: The focus of education of special education teachers should be on preparing teachers who can work in multi-category inclusive classrooms or in different schooling systems and be equipped in using assistive technology in their teaching learning process.

Aims/Objectives: The purpose of the paper was to study the trainee teacher's perception towards the use of assistive technology in universal design for learning in teaching learning process.

Method: The present study utilized survey method to examine the perceptions of the trainee teachers. Questionnaire was prepared by the researcher in Google form to obtain the data. 22 trainee teachers pursuing B.Ed. special education (Intellectual Disabilities) from Goa was selected through purposive sampling procedure to recruit the study.

Results: The trainee teachers are aware and gave positive attitude towards the use of assistive technology and Universal design for learning. The result also indicated that the trainee teachers, felt incompetent in the use of assistive technology in teaching learning process.

Conclusion: This study provided insights into the potential of the trainee teachers towards assistive technology and universal design for learning. Trainee teacher's awareness of the use of assistive technology in universal design for learning in inclusive classroom may be one of the most important outcomes in the B.Ed. special education.

Key words: Assistive technology, Universal design for learning, trainee teacher, Inclusive classroom, Teaching learning process.

Influence of Pirate Math Equation Quest Approach in Solving Word Problems by Students with Autism Spectrum Disorders

Deeksha Gera & Dr. Ambady K. G.

National Institute for the Empowerment of Persons with Intellectual Disabilities (NIEPID), Secunderabad *deekshagera1997@gmail.com

ABSTRACT

Background: Students with/without disabilities face challenges in solving mathematical problems; majorly they face difficulties in solving word problems. Children with disabilities, especially children with ASD can experience deficits in executive functioning. This can lead to difficulties in math word problem solving as it involves: Organizing information and operations, flexibly moving between pieces of information, Identifying the relevant information in the problem, and Understanding the problem holistically. Word problems by using PMEQ are open to interpretation as to where to begin, which skills to use, or in what order, it requires a deep understanding on the part of the student to determine for themselves how to solve that particular problem.

Aims/Objectives: To find out the influence of the pirate of equation quest approach in solving word problems by students with Autism spectrum disorders.

Method: A single-subject design was used to ascertain how the application of the Pirate Math Equation Quest approach affects students with autism spectrum disorders while they solve word problems. Specifically, the design was single case research design, multiple probe across the participants. The intervention went on to a total of 15 sessions per participant.

Result: The influence of Pirate Math Equation Quest approach in solving word problems by students with Autism Spectrum Disorders was evaluated. Results showed that PMEQ approach impacted positively in solving the maths word problems by students with ASD having Average intelligence in between the age group 8 to 11 years. Students were able to maintain the word problem-solving skills without using explicit models and prompts.

Conclusion: This study provided evidence to support that students with ASD having Average Intelligence can successfully learn math word problem-solving skills by using the PMEQ approach.

Keywords: *Pirate math equation quest, Autism spectrum disorder, Word problem, Addition, Individual Intervention.*

Internet Use Pattern and Attitude towards using Web-Based Information Resources among Secondary School Students

Keertisudha Rajput*, & Gomathi Sharma**

* Lecturer in Rehabilitation Psychology, NIEPID
**M. Phil. Rehabilitation Psychology Scholar, NIEPID

ABSTRACT

Introduction: Use of internet and access to the web-based information resources in increased in this decade. Each household has personal computer, laptop, tablets, smart phones and internet connection making it convenient to reach the world in no time. The students use internet not only for their academic purposes but also for online gaming, chatting, watching videos and so on. It is fruitful to study the internet use among the student community and their attitude towards web-based information resources as it has become a part and parcel of their day-to-day life.

Objectives: The objective of the current study is to explore the internet use pattern among secondary school students, their attitude towards using Web-Based Information Resources and to study if there is any difference in the attitude towards Web-Based Information Resources among secondary school students based on their gender.

Methodology: This is an inferential study conducted on 60 high school students (30 male and 30 female) in Hyderabad. The researcher made a questionnaire to assess the internet use pattern. Also, a tool on Attitude towards using Web-Based Information Resources developed by Mumtaj and Nausad (2014) is used.

Findings: The pattern of internet use among high school children will be described. The attitude towards using Web-Based Information Resources will be described. The comparative analysis among male and female students will be mentioned.

Technology Enable to Classroom: Fostering Learning for Student with Special Needs

Nivedita Singh* & Dr. Ambady K. G. **

*M.Ed Student & **Lecturer in Special Education, DSE, NIEPID, Secunderabad

ABSTRACT

This Poster presents some of the technology tools that help teachers and students to make the classroom more inclusive. Inclusive education has been recognized as a human right in the Convention of the Rights of Persons with Disabilities. Many disabled people, in particular, still experience numerous barriers to education, including learning environments which are not fully accessible (WHO, 2011)

In the educational field, students with disabilities face a set of barriers that limit their learning and achievement in different activities that take place in the classroom setting. It is essential that these students have access to the same opportunities to participate in society as their peers.

Technology is a great equalizer for many students with special needs. It can serve as a kind of cognitive prosthesis to overcome or compensate for differences among learners. The potential of technology to connect people and provide access to education, commerce, employment, and entertainment has never been greater or more rapidly changing. It has the potential to increase enjoyment and motivation and this can help learners to "progress at a pace" that is comfortable for them and increase their confidence in their abilities.

1. **The universal sandpit** is a combination of 6 AI tools that help teachers to create more ideas to teach. **https://theuniversalsandpit.org/**
2. **Natural Readers:** Natural Reader is text-to-speech software that reads digital text aloud. It can help students with reading difficulties or visual impairments by converting written content into spoken words. The software is available as a desktop application and as a browser extension. https://www.naturalreaders.com/
3. Desmos: Desmos is a math-centered platform with a number of tools to help students visualizeequations and plot graphs. Tools include the graphic calculator, scientific calculator, geometry tool, and practice tests. Students can additionally enjoy specially-designed math quizzes and games. https://www.desmos.com/
4. Total Caption CART services: Total Caption has a range of services that accommodate students with hearing loss. Tools include ASL interpretation, remote captioning, multi-language translation, and customized Zoom settings. https://www.totalcaption.com/cart/
5. Sphero's BOLT robot: These tools support students with visual impairments and are great for students who learn deeper with kinaesthetic activities. https://sphero.com/products/sphero-bolt

Teacher Techno-pedagogical Competence among Special Educators in Special School in Hyderabad

Neeti Kaushik* & Dr. Ambady K. G.**

*M.Ed Student & **Lecturer in Special Education, DSE, NIEPID, Secunderabad

ABSTRACT

Background: "In this 21st Century's technological era it's so hard to move without technology. As a result of advancement in Science and Technology there is a paradigm shift in curriculum transaction processes, and one should adopt to these changes to be lucrative.

Aims/Objectives: The purpose of the current study is to find out the use of techno-pedagogical competency among special educators in special school in Hyderabad region.

Method: A questionnaire survey method will be used. The scale for techno-pedagogical skills tool prepared by and standardized by Jeyaraj I will be used to collect the data. The Teacher's Techno-Pedagogical Competency Scale (TTPCS) under four dimensions viz.,1. Using Technology in Teaching, 2. Using Technology in Providing Learning Experiences, 3. Using Technology in Presentation 4. Using Technology in Preparation has been developed based on the tool designed by Sathyaraj and Rajasekar (2013). The scale consists of 40 items.

Results: The analyzed data shows that the competency among special educators working in special school is at average level in different domains in the Teacher's Techno-Pedagogical Competency Scale (TTPCS).

Conclusion: This study will reveal that the level Techno pedagogical competence skills of the special educators in a special school. The special educators will get to know about their competence skills regarding teaching processes.

Keywords: Techno-pedagogical, *special educators, special school, competence skill*

Eduaide: The AI Teaching Assistant

Mohammed Ajmal A. P. & Dr. Ambady K. G.

*B.Ed Student & **Lecturer in Special Education, DSE, NIEPID, Secunderabad

ABSTRACT

Intelligent education solutions with artificial intelligence (AI) are the focus of Eduaide. Eduaide provides a range of products and services that empower instructors and promote student results, all with the goal of improving the teaching and learning experience. Additionally, Eduaide offers AI-generated generative teaching tools, which may be included to lesson plans. These materials, which are intended to reinforce important ideas and encourage active learning, include worksheets, tests, and interactive exercises. With Eduaide's extensive collection of teaching tools, educators can adapt their teaching strategies to suit a variety of student learning preferences.

- AI-Assisted Lesson Planning
- Generative Teaching Resources
- Personalize, Revise, and Remix AI Outputs
- Assessment Builder
- Actionable Feedback Generator
- Expanded Language Accessibility

To sum up, Eduaide is a top supplier of AI-assisted teaching solutions designed to improve the quality of teaching and learning. Eduaide's features, which include expanded language accessibility, generative teaching resources, personalized AI outputs, assessment builder, and actionable feedback generator, enable teachers to plan engaging and productive lessons, evaluate student progress, and give tailored feedback. Eduaide is transforming education and assisting teachers in providing pupils with high-quality instruction by utilizing artificial intelligence.

Internet Use Pattern and Attitude towards using Web-Based Information Resources: A Correlational Study

Keertisudha Rajput*, & Gomathi Sharma**

* Lecturer in Rehabilitation Psychology, NIEPID
**M. Phil. Rehabilitation Psychology Scholar, NIEPID

Introduction: Information may be gathered from various sources including interpersonal conversation, reading printed material, and web-based resources. Current generation is found to be engaged more with the internet where enormous information is available at the tip of finger. It will be enlightening to study if there is any relationship between the internet use pattern and the attitude towards using web-based information resources.

Objective: The objective is to study the correlation between internet use pattern and attitude towards using Web-Based Information Resources among secondary school students.

Methodology: This is an inferential study conducted on 60 high school students (30 male and 30 female) in Hyderabad. The researcher made a questionnaire to assess the internet use pattern. Also, a tool on Attitude towards using Web-Based Information Resources developed by Mumtaj and Nausad (2014) is used.

Findings: The demographic details of the participants will be described. The findings of correlation analysis will be explained.

Use of Digital Technology for Students with Intellectual Disability in Government schools of Ujjain District

Yogita Sharma *, & Pushpa Vaishnav**

**Research Scholar, School of Studies in Continuing Education, Vikram University, Ujjain MP medyogita@gmail.com[1]*

*** National Institute of public Cooperation and Child Development, Ministry of women and child development, Govt. of India western Regional centre Indore MP*

ABSTRACT

Digital Technology is an essential component of teaching and learning in the 21st century. The teaching and learning are easily conducted using digital technology for students with Intellectual Disability. Learning becomes easy, enjoyable, and interesting for understanding the content. The classroom environment is flexible and collaborative learning is possible with the help of Digital Technology.

Objectives:

- To find the use of digital technology in teaching and learning for students with Intellectual Disability in Govt. schools of Ujjain District
- To find the use of digital tethnology for primary Govt. schools teachers of Ujjain District

Methodology: Descriptive Survey method was administered for the study. The sample for the study researcher selected the 10 government schools of Ujjain district Madhya Pradesh. 25 primary government school teachers were interviewed based on a questionnaire prepared by the researcher.

Result: it was determined through the interviews that primary government school teachers of the Ujjain district are aware of digital technology and require training in the use of Digital technology to meet the learning needs of diverse children.

Conclusion: In-service teachers require training in being competitive to meet the functional and conceptual needs of inclusive schools.

Key point: Intellectual Disability, Digital Technology, Multimedia, Teaching, and Learning

Pirate Math Equation Quest

Deeksha Gera & Dr. Ambady K. G.

National Institute for the Empowerment of Persons with Intellectual Disabilities (NIEPID), Secunderabad *deekshagera1997@gmail.com

ABSTRACT

Pirate Math Equation Quest is a word-problem intervention designed to help elementary students increase their knowledge of total, difference, and change problems (individual intervention) or total, difference, change, and equal groups problems (small-group intervention). The intervention is designed to be implemented by educators in school settings. (Pirate Math Equation Quest, n.d.)

It is a word-problem intervention for third-grade students who require supplemental remediation in word-problem solving. Students receive explicit instruction on reading, interpreting, setting up, and solving word problems with a focus on schemas. Students also receive modeling and practice related to understanding the equal sign and equation solving. (Pirate Math Equation Quest: A Math Word-Problem Intervention - the Meadows Center, n.d.)

Pirate Math Equation Quest: Individual Word-Problem Intervention with Total, Difference, and Change Schemas for use with students in the elementary grades who need to learn how to solve additive word problems. This version of the program offers individual support to Tier-2 and Tier-3 students who require supplemental mathematics remediation in the area of word problem-solving.

It challenges students to understand each new concept in relation to other math skills they've gained over the years and will often require a student to use two or more math skills together to find the correct solution. In addition to refreshing their memory about older concepts, this multi-skill approach strengthens critical analysis ability and encourages creative thinking.

Word problems by using PMEQ are open to interpretation as to where to begin, which skills to use, or in what order, it requires a deep understanding on the part of the student to determine for themselves how to solve that particular problem. (*Mathnasium*, 2023)

Pirate Math Equation Quest is an extension of the Pirate Math program developed by Lynn Fuchs, Ph.D., and her colleagues at Vanderbilt University.

Use of Info graphic Cognitive Load Theory in the Inclusive Classroom

Neeti Kaushik & Dr. Ambady K. G.

National Institute for the Empowerment of Persons with Intellectual Disabilities (NIEPID), Secunderabad

ABSTRACT

A theoretical concept that is becoming more and more important in the literature on educational research is cognitive load. The fundamental tenet of cognitive load theory is that learning will be hindered if a task requiring an excessive amount of cognitive capacity is given to working memory due to its limited capacity. Designing educational programs to minimize cognitive overload and maximize working memory capacity is the advised course of action.

The idea of cognitive load has significantly expanded the field of educational research and provided an explanation for a wide range of experimental results especially in the field of special education. This paper aims to investigate the use of info graphic cognitive load theory in the inclusive classroom to especially help the children with special needs and unanswered concerns surrounding cognitive load theory by highlighting several significant philosophical, methodological, and application-related issues in the inclusive classroom.

Key words: cognitive load theory, inclusive classroom, capacity, memory

Using of Smart Fast Bridge for Increasing Reading Competency among Students with Specific Learning Disability

Anjali Singh* & Dr. Ambady K. G. **

*M.Ed Student & **Lecturer in Special Education, DSE, NIEPID, Secunderabad

ABSTRACT

The aim of this study is to improve the reading skills of the students having difficulty in reading comprehension. The current study was conducted by means of one subject research technique. The study was carried out with one participant from third grade. In order to collect data for the study, word recognition test, reading texts, and reading comprehension test were employed. In line with the purposes of the study, the collected data were analyzed through qualitative and the results were explained as qualitative by using smart fast bridge. At the end of the study, by using smart fast bridge, it was found that some improvement was seen in the participant in word recognition skills and reading aloud skills. It was concluded that the intervention for the enhancement is achieved.

A major reason for the poor performance of children with specific learning disability is their failure to read strategically and monitor understanding what they are reading. We also know that children with specific learning disability have much more difficulty with reading comprehension than do students without disabilities, even when levels of decoding ability are controlled. These finding questions one current conceptualization of learning disabilities as primarily a problem at the word-reading level and suggests children with specific learning disabilities are more complicated than Recognition deficits. The research shows that almost 20-30% of students in India experience difficulties in reading. Reading is an interactive process consisting of inferring, knowing correct sounds. As none of the students fail in elementary education, the students having reading difficulties pass their classes; yet, they cannot perform reading at the level expected of their grade; hence, they experience various problems such as anxiety and depression throughout their schooling. They are usually tagged as unsuccessful students throughout their education. Moreover, they cannot get the help needed to resolve their problems and they experience adaptation problems in their classes (Bender, 2012).

Objectives

1. To have the knowledge about phonics by using smart fast bridge.
2. To make them use phonic sounds through smart fast bridge in CVC and CVCC words.
3. Using the phonics to blend the words through fast bridge technology.

Keywords: Smart Fast Bridge, Reading Skills, Reading Disability, Enrichment Reading Program.

Techno-Pedagogic Intervention for Students with Disabilities: Inferences from Literature

Wasim Ahmad*

**Lecturer in Special Education (Intellectual Disability), NIEPID RC, Navi Mumbai*
Email:wasimniepid@gmail.com

ABSTRACT

Background: The evolution of technology has contributed a lot to the advancement of all walks of life of mankind. However, the emergence of techno-pedagogic is a recent development. The education of children with special needs is no longer dependent on a traditional approach but rather it has shifted to the use of advanced technology. The term refers to teaching practices that combine pedagogical (teaching and learning methods, motivation, development of students' skills), and technological aspects (using computers, the Internet, interactive whiteboards, etc.).

Objective: The purpose of this paper is to highlight the importance of techno-pedagogic intervention for teaching children with diverse needs in mainstream educational settings. **Method:** The literature available on use of techno-pedagogic intervention for children with special needs have been critically reviewed.

Results: As a matter of fact survival without technology cannot be imagined. In today's life, no one can survive without technology. The research conducted suggests that the use of techno-pedagogy intervention may improve the overall quality of teaching by making the students with disabilities more receptive during the teaching-learning process. As a result, techno-pedagogy enhances the level of student participation and contribution during the learning process. A well-developed techno-pedagogic helps impart education to students with disabilities using a range of learning styles.

Conclusion: Even though Inclusive education is concerned with removing all barriers to learning, and with the participation of all learners vulnerable to exclusion, we are lacking in its successful implementation due to various barriers. Despite, there are handfuls numbers of research that suggests that the use of techno-pedagogic intervention can bring positive learning outcomes among children with disabilities, its real implementation in Indian settings needs to be studied. This paper discusses these constraints and the strategies to overcome them so that all children with special needs would benefit from techno-pedagogic approaches.

Keywords: *Techno-pedagogic, Inclusive Education, Students with Disabilities*

Enhancing Educational Accessibility: Exploring the Apps for Students with Special Needs

K. Sateesh*, Sayana K* & Dr. G. Sudhakar**

*M.Ed Student & **Lecturer in Special Education, DSE, NIEPID, Secunderabad

In an era where technology is revolutionizing education, the landscape of applications tailored to cater to the unique learning requirements of students with special needs. Focusing on diverse educational challenges, the research delves into the role and impact of specialized apps in facilitating learning, communication, organization, and skill development for students with disabilities

Researcher has explored apps for the students with special needs. The apps for the children with intellectual disabilities are Cozi Family Organizer, Evernote, Evelity and Breathe2Relax. Apps for the students with specific learning disability are ModMath, Bob Books Reading Magic, Dyslexia Toolbox and Learning Ally Audio book.

Apps designed for special needs can be incredibly helpful in various ways: Personalization, Accessibility Features, Skill Development, Organization and Planning, Engagement and Motivation, Communication Aids and Support and Independence Ultimately, these apps empower individuals with special needs by providing tools and resources tailored to their unique requirements, fostering an inclusive and supportive learning environment.

AUTISM BASICS: Learning App

Dinu John* & Dr. Usha K**

* M.Ed. Special Education (ID) student, NIEPID, India *dinujohn1996@gmail.com*
** Assistant Professor in Special Education, NIEPID kundapurausha31@gmail.com

Autism BASICS is an app developed by a team of Psychologists, Speech Therapists, Behavioral Therapists and Occupational Therapists to positively engage kids with Autism and other special needs and empower their parents to work closely with their children. Autism BASICSapp is a holistic fun learning app for kids. It is much helpful for children who are in their early childhood. The Autism BASICS app is helpful for kids with Autism and this app has an added focus on special needs children and slow learners. All the essential fundamentals are interactively introduced to the kid using the peer-modeling concept. The app is divided into two major sections- child section and care giver section. The word Basics indicate the various areas covered in this app, that form a kid's basic essentials. They are Behaviour, Academics, Sensory integration, independent living skills, Communication, and social skills. There are Practice exercises with increasing levels of difficulty are present for every activity. These are designed based on ABA methodologies to foster learning in kid. Autistic kids need intervention in specific areas, such as speech, behaviour, motor functions, and sensory integration. This app provides help with learning exercises so that a parent can set training exercises to make their kids practice.

However, kids with mild Autism and somewhat moderate autistic kids can benefit from Autism Basics app. In contrast, moderate and severely Autistic children might need in-person therapy sessions. Having these practice sessions, besides taking therapies, is always helpful. Some sections of the Autism Basics app are free, while others need a premium subscription. With real-life images, repetitive prompting, pronunciation with different speeds, peer-modeling videos, and encouragement to learn through ABA techniques, learning on this app would be fun for kids. Currently, there are many categories available, such as Alphabets, Spellings, Pre-math, Math, First words, Matching, Body parts, Memory, Time, Yes-No, First words Slideshow, Good Manners and Habits. As parental control is present to design the model and duration of the daily exercises, the learning takes place in a controlled way and the child will not overuse the device or get addicted to the screen, as the duration is limited. The parent or caregiver can make the best use of this app by designing exercises for the child, from various categories. The parent can also set the time duration and difficulty level of the exercises. This enables learning for the child while restricting from overuse of the device.

भारतीय पुनर्वास परिषद

स्वावलम्बन
Swavlamban

NIEPID

REHABILITATION 2.0

National Institute for the Empowerment of Persons with Intellectual Disabilities (DIVYANGJAN)

Manovikas Nagar P. O., Secunderabad - 500009, Telangana