ISSN 2348 3490

JAMIA JOURNAL OF EDUCATION

A Peer Reviewed Refereed International Biannual Publication

Special Issue

FACULTY OF EDUCATION
JAMIA MILLIA ISLAMIA
NEW DELHI – 110025
INDIA

ISSN 2348 3490

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EDITORIAL BOARD

ISSN 2348-3490

Jamia Journal of Education

A Peer Reviewed Refereed International Biannual Publication

Special Issue

Published by:
Faculty of Education
Jamia Millia Islamia
New Delhi, INDIA.

vgttconf24@gmail.com

Composed, Editing & Corresponding by:
Mr. Mumtaz Ali & Ms. Shahin Parveen
Office of the Dean, Faculty of Education, JMI

ISSN 2348 3490

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जामिया मिल्लिया इस्लामिया
(केन्द्रीय विश्वविद्यालय)
मौलाना मोहम्मद अली जौहर मार्ग, नई दिल्ली-११००२५

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(A Central University)
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(NAAC Accredited 'A++' Grade)

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(مرکزی یونیورسٹی)
مولانا محمد علی جوہر مارگ، نئی دہلی۔۱۱۰۰۲۵

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प्रोफ़ेसर मज़हर आसिफ़
कुलपति

Prof. Mazhar Asif
Vice Chancellor

پروفیسر مظہر آصف
شیخ الجامعہ

Vice-Chancellor's Message

Inclusive education is a legal mandate, as it is one of the recommendations of the New Education Policy 2020. It is one of the major leading template shifts in educational philosophy, educational pedagogy, and educational administration. Out of all the left-behind marginalized groups, disability is considered a double disadvantage—more so for the students with specific learning disabilities due to its hidden nature.

The papers presented at the conference helped to record its history, the reasons it started, its symptoms, and the newest developments in medicine to help with accurate diagnosis. They also talked about the use of new technology like apps and AI for teaching and learning, as well as gaps in the policies at the executive level for helping college students with specific learning disabilities.

The special issue will help to provide literature on the topic of national importance and to enrich the less progressed content on the theme. It will also support the Centrally Sponsored Scheme of the Ministry of Education to disseminate knowledge about specific learning disabilities to all stakeholders. The Special Issue on Specific Learning Disability highlights the key message that there is a neurodiversity present in the students. Researchers identify the condition as a gift of capabilities, not a limiting condition of possibilities. Specific learning disabilities are neurodiversity present in the students. Researchers identify the condition as a gift of capabilities, not a limiting condition of possibilities.

(Prof. Mazhar Asif)
Vice-Chancellor

जामिया मिल्लिया इस्लामिया
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Prof. Sara Begum
Dean

From the Desk of Editor in Chief

The impact of Specific Learning Disabilities on Academic Progression in Institutes of Higher Education is not a piece of common knowledge because it is the latest addition as one of the conditions in the list of disabilities.

Although it was officially included in the 'Rights of Persons with Disabilities Act' in 2016, there remains a significant gap in awareness, diagnosis, and support. A large percentage of students around 20% are affected by learning disabilities, often leading to academic struggles, and in some cases, forced dropout from educational institutions. They remained uncatered and unattended, forcing them to exit educational institutions.

The successful completion of the international conference on "Specific Learning Disability: Theoretical Paradigm Interventions in the Educational System' marks a significant milestone in our ongoing efforts to foster inclusive and equitable education. This conference has played a crucial role in disseminating correct and updated knowledge on Specific Learning Disabilities (SLD), addressing both academic challenges and societal awareness.

This publication is a valuable resource that encapsulates the extensive research, expert opinions, and practical solutions discussed during the conference. It provides a comprehensive understanding of SLD, including its cognitive and neurological basis, as well as its manifestations in students. The publication presents empirical data, case studies, and evidence-based research that highlight the prevalence, challenges, and coping mechanisms of students with SLD. It also offers innovative pedagogical strategies to help educators implement adaptive teaching methods, differentiated instruction techniques, and technology-integrated learning approaches to make education more accessible. Additionally, it examines existing legal and policy frameworks, identifying gaps in implementation and suggesting necessary reforms to strengthen institutional support for students with learning disabilities. By incorporating interdisciplinary perspectives from neuroscientists, psychologists, and educationists, the publication ensures that support strategies are scientifically grounded and practically viable. Furthermore, it explores holistic development approaches that address the social, emotional, and psychological well-being of students with SLD, emphasizing the need for a supportive and understanding learning environment.

Looking Forward

This publication is not just a documentation of academic discussions; it is a call to action. By equipping educators, institutions, and policymakers with the necessary knowledge, it paves the way for substantial improvements in inclusive education. We hope that this work will inspire further research, drive policy enhancements, and lead to the implementation of effective teaching and intervention strategies.

Our institution remains steadfast in its commitment to creating an educational landscape where every learner, regardless of their challenges, receives the support they need to thrive. I extend my heartfelt gratitude to all contributors, researchers, and educators who have made this conference and publication possible. May this endeavor continue to serve as a guiding light in advancing education for all.

With best wishes

Prof. Sara Begum
(Editor-in-Chief)

EDITORIAL

An online two days International Conference on "*Specific Learning Disability-Theoretical Paradigms and Practical Interventions in the Education Systems*"_was held on 22-23 March 2024. It was conducted by the Teacher Training and Non-Formal Education Department of the Jamia Millia Islamia University.

The conference disseminated knowledge on Specific Learning Disability. The conference had nine themes. The two-day conference had 8 sessions. The eminent speakers were drawn from the medical field, educational psychology, pedagogy and special education. The online format helped to engage international and national speakers on the online platform. Besides the eminent speakers many research scholars engaged in the research on the topic also shared the platform to showcase their work. A few scholars registered as audience as well. A total of thirty-Four papers were presented. These papers were reviewed by the journal editorial team and a total of 28 papers are selected for the publication in the special issue of the Jamia Journal of Education.

The first theme on concept of the specific learning disability had deliberations from the perspective of neurobiology and behavior science. It also traced the journey of the concept of SLD from being a nonexistence to finding its roots in biosciences with experimental researches. The second theme further detailed out behavioral and medical symptoms present in a child with SLD. The linkage with medical science was enriching and helpful. In spite of the fact that the condition is identified as one of the disabilities in the Rights of Person with Disability Act of 2016, there are gaps in the executive policies for the diagnosis, certification and provisions for intervention. Papers related to the policies were informative for stakeholder. The questions are asked about its treatment as a condition. In medical terms, other disabilities can be corrected by medicines or other interventions. The papers on its correction or therapies were helpful to understand the status today. Meanwhile, behavior scientists are using educational intervention not to correct but to educate students with SLD successfully. Discussion on such practices was illuminating. The conference also provided the platform to discover Indian knowledge of its genesis, correction and results. Most of the nine themes were overlapping in the papers. Each paper is sufficient in detailing the concept it focused on.

Editor

Early Indicators of Risk Factors for Specific Learning Disabilities

Jayanthi Narayanan[1]

Abstract

Specific Learning Disability (SLD) is an invisible condition that manifests only when the child begins to learn academics. Therefore, confirming the diagnosis of SLD is not possible before the child learns academics. It is well established that early intervention in critical years of a child minimizes the impact of any disability. In the case of SLD, it is a challenge as the child does not start learning academics until s/he enters preprimary class. Further, in India, legally testing for certification of SLD cannot be done before the child attains the age of eight. Yet, many studies point to the merits in early identification of 'risk factors' in a child for possible SLD. Such a study was conducted on early indicators of risk factors and is reported here. This study is based on a survey, by collecting information on early indicators from 36 parents who have children with the diagnosis of SLD. The result indicated 13 symptoms as reported by the parents. Among them, delay in speech, poor attention and distractibility, found to be on the move most of the time, no interest in picture books and paper pencil/crayon work, were reported by all the parents. Various interventions sought by parents and the way forward are discussed.

Keywords: Specific Learning Disability, early indicators, early Screening, identification, parental perception, certification of SLD, risk factors for SLD

Introduction:

In recent years, there is a considerable focus on this condition called Specific Learning Disability (SLD). People with this disability have been among us through centuries but not identified and provided with appropriate support. Today, we notice the names documented, such as Alexander Graham Bell, Albert Einstein, Thomas Alva Edison and Louis Pasteur and many more to have possibly had Specific Learning Disability. (Donna, 2013). Since there was no awareness and systematic identification processes in early years, most of these eminent persons were expelled from the school system and they

[1] **Deputy Director** (Retired) National Institute for the Empowerment of Persons with Intellectual Disabilities (NIEPID) Under DEPwD, Govt.of India

struggled to reach the status for which we are celebrating them today. The invisible nature of the disability is a contributing factor leading to complexity in identifying the condition. Further, as the disability is in the area of *learning academics*, that includes dyslexia (difficulty in reading), dysgraphia (difficulty in writing), dyscalculia (difficulty in doing mathematics), it becomes difficult for identification in the early and critical years of the child's life. This is because the child learns academics only on entering preschool and the disability may manifest when the child is introduced to pre academics. As rightly noted by Smith (1994), the development of academic skills is not at the forefront in early childhood and therefore, the degree of inadequacy in the developmental areas with the potential *to predict* academic failure can only be observed rather than academic failure itself.

It is well documented that early identification minimizes the impact of any disability in a child. (Mercer, 1997; Walker and Shinn, 2002). Baggett et al (2023) observed that understanding of the behavioural indicators related to dysgraphia and dyslexia can help children at risk for poor academic or social success and recommend the use of dysgraphia and dyslexia behavioural indicator checklist by the professionals. Colebrander et al (2018) after reviewing literature on theoretical arguments and research evidence concluded that early identification of dyslexia is crucial to ensure that children are able to maximise their educational potential, and speech language pathologists are well placed to play a role in this process. Snowling (2013) further recommend that early identification of children at risk of dyslexia followed by the implementation of intervention as a realistic aim for practitioners and policy-makers. Sanfilippo et al (2020) quoting cognitive-behavioural research have noted that there are early literacy skill deficits that represent red flags for dyslexia risk and can be measured at a preschool age. They further note that this evidence points to dyslexia as a disorder that can be flagged by a paediatrician before school entry, during a period of heightened brain plasticity when interventions are more likely to be effective.

In India, research on specific learning disabilities, especially on early indicators of risk factors is yet to catch momentum. There are studies quoting the importance of early intervention and the efforts on early stimulation and intervention in general for all disabilities is gaining focus. Cross disability early intervention programme (CDEI) is given a thrust and the Department of Empowerment of Persons with Disabilities (DEPwD) has prepared the guidelines for intervention of children at risk/with disability from 0 to 6 years. (Pratham, AYJNISHD (D) and RCI, 2023). Specific learning disabilities is also given a focus on early identification of risk factors in these guidelines along with other disabilities. A study on perceptions of paediatricians on early intervention in the state of Gujarat revealed that though the participants agreed on the importance of early intervention, the barriers to screening were insufficient time, lack of treatment choices, and lack of knowledge regarding referral options and the paucity of early intervention services.(Desai and Mohite, 2011). If this is the situation with visible disabilities, it is all the more complex when we consider specific learning disability which is invisible. Singh et al (2017) studied children identified as having specific learning disabilities with a large sample of 2015, over a period of five years and found that majority of the children were

from English medium schools, in the age range of 8-12 years, with a considerable delay in seeking medical help and were referred mostly by the teachers for academic issues. The study highlighted the importance of looking for early signs of specific learning disabilities and co morbid conditions in children. Further, the study by Ramaa (2000) after analysing the research studies on the status of SLD for two decades in the country, points to the complexity of educating such children due to the number of languages resulting in various medium of instruction in the country.

The research efforts in India as well as in the other countries point to the importance of early identification of risk factors for specific learning disabilities to minimise its effect on the academic learning later in children at risk.

Current scenario in the Country: Specific learning disabilities ware not given a legal status as a disability until 2016. However, a few Nongovernment organisations (NGOs), regular schools and a few Boards of Education in the country were providing these children with support through resource room teaching, remedial education and after school tutoring. Some concession in examinations and curriculum relaxations were offered by some of the Boards of education which were case specific, where a panel of experts recommended them for support after assessing each child. Parents and the schools faced considerable difficulties in availing these supports. As awareness was limited, many did not get the support. When the Persons with disabilities Act 1995 was enacted, it did not include SLD. It is only in the year 2016 when persons with disability Act (RPwD) was enacted replacing the Persons with disabilities Act of 1995 that SLD got a legal status. This led to efforts towards streamlining certification and access to appropriate supports.

Certification: The certification procedure for SLD is done at three stages for a child – once at 8 years, once at 14 years and once at 18 years. As per the RPwD and the guidelines for certification, consists of the panel of experts as seen in Box 1.

Box 1. Certifying team for SLD

22.5. Medical Authority:

The Medical Superintendent or Chief Medical Officer or Civil Surgeon or any other equivalent authority as notified by the State Government shall be head the certification authority.

The medical authority will comprise:

The Medical Superintendent or Chief Medical Officer or Civil Surgeon or any other equivalent authority as notified by the State Government,

Pediatrician or Pediatric Neurologist (where available)

Clinical or Rehabilitation Psychologist

Occupational therapist or Special Educator or Teacher trained for assessment of SLD.

(Gazette Notification of MINISTRY OF SOCIAL JUSTICE AND EMPOWERMENT [Department of Empowerment of Persons with Disabilities (Divyangjan)] NOTIFICATION New Delhi, the 4th January, 2018 p.9,)

As seen earlier, the certification is to be done three times in the life of a person with SLD and the first assessment is done only at the age of eight years. (BOX 2). This is so because the SLD is invisible and manifests only when the academic learning begins in a child. To ensure consistency in the problems that the child encounters, a period of three years in school (preprimary, class 1 and 2) are allowed to observe the child and then to be referred for assessment for SLD.

22.6**. Validity of Certificate**: The certification will be done for children aged eight years and above only. The child will have to undergo repeat certification at the age of 14 years and at the age of 18 years. The certificate issued at 18 years will be valid life-long.

(Gazette Notification of MINISTRY OF SOCIAL JUSTICE AND EMPOWERMENT [Department of Empowerment of Persons with Disabilities (Divyangjan)] NOTIFICATION New Delhi, the 4th January, 2018 p.9)

The Challenge: On the one side, we insist on early identification and intervention for minimizing the effect of a disability in a child and on the other, we delay the legal support as the condition cannot have a clear diagnosis before the academic learning begins. If the teacher waits for a diagnosis to help the child, precious critical years would be lost. So we need to find a way of helping children who may be at risk for SLD by identifying early indicators of risk factors so that these children can be supported without labelling them.

The Current Study: Keeping the points as discussed above in view, the current study aimed at identifying the indicators of SLD in early childhood. To achieve this objective, parents of children who were diagnosed as having SLD were contacted to find details on the early behavioural indicators in their children that are generally not present in the typically growing children. It was assumed that such an analysis will throw light on identifying children at risk for SLD even before they start learning academics in school.

Specific objective: To identify the indicators of specific learning disabilities in children in their early years (before schooling) as observed by the parents.

Method: The study adopted a mixed method involving a survey and interview. The survey was through a closed ended questionnaire with space at the end for participants to inform what they could not say in the closed ended questionnaire as it only elicits answers from the given options. Based on the responses at the open ended question, five participants were interviewed to get more clarity on their response.

Participants: Participants were parents of children who are diagnosed as having specific learning disabilities. As these parents would have observed their children from childhood even when there was no diagnosis made, their observation is considered valuable for identifying early indicators. Hence they were chosen for the study. The

parents whose children attended resource room education and regular schools with support for Specific learning disability were contacted and explained about the purpose of the study. Those who volunteered were included in the study.

Instrument: As mentioned above, the closed ended questionnaire consisting of content related to early indicators (before the age of four) of specific learning disabilities as noted through research studies were listed with response options. There were also items related to symptoms of other disabilities in the questionnaire as distractors to ensure that the correct responses are received. At the end of the questionnaire, there was an open ended question to let the parents note down any other information that they wish to inform about their child. The tool was piloted on five parents who were not participants for the main study. After modifying based on the pilot testing the tool was ready for sending to parents.

Ethical Consideration: All the prospective participants were informed about the purpose of the study and how valuable their responses would be in early identification of children at risk for SLD. Clarification sought by the parents and details on anonymity and confidentiality of the data and the specific use of it for the study were explained. Volunteering parents were included for the study.

Procedure: The questionnaires were partly sent online and some were personally handed over. A total of 50 parents were sent the questionnaires and a total of 36 (72%) parents responded. Based on the responses for the open ended question, five parents were interviewed to gather more information. The data was analysed.

Result:

Profile of the participants: Among the participants, 13 were fathers and 23 were mothers. Among the fathers, seven had post graduate/professional qualification, four were graduates and two had completed high school education. Among the mothers, seven were post graduates, 10 were graduates and six had completed high school. All fathers and 12 mother were employed or had their own business.

Children with Specific learning disabilities: Among these parents, 25 had male children with SLD while 11 had female children. A total of 17 of these children had one sibling, seven had two siblings and 12 were children were only child to the parents. The mean age of the children with SLD was 10 years with the range of 9 to 13 years.

Early indicators of SLD as noted by the parents:

When analysed, the responses of the parents indicated 13 early indicators that can be risk factors for SLD. (Table 1).

Among the indicators, speech delay, and quick shifting from one activity another without completing the task were found to be most frequently noted by the parents. Easily getting distracted, and not staying at one place too were noted by most parents. Not showing interest in seeing picture books and no interest in scribbling/ use of crayons and pencils too were noted by the parents. Parents who had more than one

child were clearly comparing this child with their other children's growth and development and had noted the indicators in their responses. Parental education levels did not make much difference in the observations about their child.

Table 1 Early indicators as observed by the parents.(2 to 5 years)

Sl. No	Indicator	Parental response	Percentage
1.	Speech delay	30	83
2	Quickly shifted from one activity to another without completing the task	30	83
3.	Easily distracted, poor attention	29	81
4	Did not prefer stay at one place, mostly on the move	28	78
5	Did not show interest in picture books	27	75
6	No interest in paper crayon work	27	75
7	Wanted to talk, but not able to express coherently	25	69
8.	Difficulty in activities involving hands e.g.threading beads	24	67
9	Did not prefer to play with other children	24	67
10	Difficulty in holding pencil/crayon correctly	23	64
11	Confused with direction	23	64
12	Would say alphabets and numbers but no interest in reading and writing	22	61
13	Difficulty in counting, naming colours, size and so on	20	56

It is important to note that all the parent had observed the following symptoms in combination in their child before the age of four. (Table 2)

Table 2: commonly seen symptoms in combination by all participants.

Easily distracted, poor attention
Delay in speech
Found to be 'on the move'
No interest in books
No interest in paper pencil work

As rightly noted by Hallahan et al (2005), it is often difficult to decide whether there is a developmental delay or slow maturation in the child concerning the difference compared to his/her peers and many children with incompetence can follow a slow developmental process but can later catch up with their peers. This being the case, the observation by all the parents on the symptoms as seen in Table 2 gives directions to get alert and seek help early irrespective of what could be the diagnosis later when the child is tested. Early intervention helps in minimising the effect of the disability if any.

Intervention:

On analysing the responses on the intervention sought by the parents, 21 (58%) out of the 36 parents did not perceive that there could be a problem in the child. This is not surprising considering the fact that SLD is an invisible disability. These children were

identified when admitted to school. Among them, 4 were identified in class I, six in class II, five in class III. 4 in class IV and 2 in class V. Parental gender, education or employment status did not have any correlation to the perception of the possible SLD in the child until referral by the school.

The rest of the 15 respondents sought medical help. Among them, the 8 were referred by the doctor for occupational therapy, 4 were given medical prescription and three were referred to early intervention. For all the children, the diagnosis was done after the age of 8 as per the legal provision. However, they were receiving the support as mentioned above considering the child to be at risk. Those identified in school, 11 were receiving private tutorial support and 8 received remedial instruction in the school in the resource room. Two were helped by the mother at home in consultation with the class teacher. Among the other 15 parents who sought medical support and referral, seven mothers were helping the children at home following the instruction of the occupational therapist or early interventionist. Out of the 9 mothers who were helping at home, six of them were not employed and three were employed.

Interviewing five respondents based on the information provided by them for the open ended question, it was noted that irrespective of the education or employment status of the respondents, they all had prime concern for their child in early childhood but did not know if it were a passing stage or needs to be 'treated'. As one father of a single child had mentioned:

'……we found him to be different from his age peers but could not pin point on what is wrong or what we should be doing…..'

A mother had commented:

'……..my son was smart, good with mechanical toys/mobile phones, intelligent ….i had the least suspicion if anything could be wrong with him, until the school referred us for support….he was much more active than my elder son and will not sit at on place for even minute….'

This comment reveals that though the parents notice hyperactivity, it is perceived as an acceptable behaviour.

All the five parents mentioned that their child is intelligent but lacked focus. One mother said:

'It was very difficult to have him stay at one place to carry out a task. But very smart and intelligent…remembers the songs that he hears even once……He was always moving…sometimes getting hurt…….very difficult to take him out on social gatherings…'

Being a hidden disability with varied behavioural manifestations, SLD is still a challenge for the professionals and parents to identify early and provide the support.

Discussion and Conclusion: This small study reveals that a condition like specific learning disability cannot be diagnosed until the child starts to learn academics and the parents are in a good position to observe the indicators that can point to risk factors in a

child for having SLD. Balikci and Melecoglu (2020) after conducting an extensive review of research literature on indicators of SLD in early childhood suggest that the signs of specific learning disabilities can be seen in early childhood and the preschool teachers and families should be sensitive to the characteristics of children at risk of specific learning disabilities in the context of early intervention. It is important that parents, preschool teachers and the regular school teachers are sensitized on this invisible condition and possible risk factors in early childhood. Though it is not possible to generalize the findings of this study as the number of participants is small, it reveals the trend that parents are concerned about their child's education, but many do not suspect any problem due to the invisible nature of the condition. All the parents have noted certain symptoms as seen in Table 2 and these details need to be given focus for early identification and intervention.

To conclude, More studies in early identification are to be conducted which will give direction to the parents and preschool teachers, who are key players in helping the child even before a diagnosis. Early screening tools are to be made available and accessible to assist the parents and teachers. It is important to spread the word that these children at an early age, are not diagnosed as having SLD, but are at risk for SLD, thus avoiding labeling, while not compromising on the intervention that they deserve to get. Above all, as it is an invisible disability, the teachers, medical professionals and the therapists should work together to help the child at risk early and not to wait for the diagnosis as it will happen only after the age of eight years.

References

Baggett, M., Diamond, L. L., & Olszewski, A. (2023). Dysgraphia and Dyslexia Indicators: Analyzing Children's Writing. Intervention in School and Clinic, 0(0). https://doi.org/10.1177/10534512231189449

Balikci, O. S. & Melekoglu, M. A., (2020). Early signs of specific learning disabilities in early childhood. International Journal of Early Childhood Special Education, 12(1), doi: 10.20489/intjecse.722383 R

Colenbrander, D & Ricketts, J & Breadmore, H. (2018). Early Identification of Dyslexia: Understanding the Issues. Language, Speech, and Hearing Services in Schools. 49. 817-828. 10.1044/2018_lshss-dyslc-18-0007.

Desai P.P, Mohite P. An exploratory study of early intervention in Gujarat state, India: pediatricians' perspectives. Journal of Dev Behav Pediatr. 2011 Jan;32(1):69-74. doi: 10.1097/DBP.0b013e3181f46e0b. PMID: 21160440.

Donna, D (2013). Famous people with learning disabilities. https://www.gemmlearning.com/blog/learning-issues/famous-people-with-learning-disabilities/#:~:text=That's%20what%20happened%20to%20several,disability%20didn't%20stop%20him.

Hallahan, D.P., Llyod, J. W., Kauffman, J. M., Weiss, M. P., & Martinez, E. A. (2005). Learning disabilities: Foundations, characteristics, and effective teaching (3rd edition).NewYork, NY:Pearson.

Høien, T., Lundberg, Mercer, C. M. (1997). *Students with learning disabilities (5th edition).* Boston, MA: Prentice-Hall.

Pratham & AYJNISHD (2023). Curricular framework for cross disability early intervention and school readiness. New Delhi: Rehabilitation Council of India.

Ramaa. S. (2000). Two decades of research on learning disabilities in India. Dyslexia (Chichester, England). 6. 268-83. 10.1002/1099-0909(200010/12)6:4<268::AID-DYS177>3.0.CO;2-A.
https://rehabcouncil.nic.in/sites/default/files/pratham_book.pdf

Sanfilippo J, Ness M, Petscher Y, Rappaport L, Zuckerman B, Gaab N. (2020). Reintroducing Dyslexia: Early Identification and Implications for Pediatric Practice. Pediatrics. 2020 Jul;146(1):e20193046. doi: 10.1542/peds.2019-3046. Epub PMID: 32576595; PMCID: PMC7329249.

Singh, S, Sawani, V , Deokate, M, Panchal, S, Subramanyam, A& Shah, H & Kamath, Ravi. (2017). Specific learning disability: a 5 year study from India. International Journal of Contemporary Pediatrics. 4. 863. 10.18203/2349-3291.ijcp20171687.

Smith, C. R. (1994). Learning disabilities, the interaction of learner, task, and setting (3rd edition). Allyn and Bacon.

Snowling MJ. (2013). Early identification and interventions for dyslexia: a contemporary view. J Res Spec Educ Needs. 13(1):7-14. doi: 10.1111/j.1471-3802.2012.01262.x. PMID: 26290655; PMCID: PMC4538781.

Walker, H. M., & Shinn, M. R. (2002). Structuring school-based interventions to achieve integrated primary, secondary, and tertiary prevention goals for safe and effective schools. In M. A. Shinn, H.M. Walker, G. Stoner, (Eds.), Interventions for academic and behavior problems II: Preventive and remedial approaches, (pp. 1-25). Bethesda, MD: National Association of School Psychologists.

Maths makes Sense Now: Dyslexia, Numeracy and the Davis Method

Richard Whitehead[1]

Abstract

Dyscalculia manifests primarily as a challenge with number sense and is marked by difficulties in understanding number relationships, counting, and arithmetic. Highlighting the prevalence of numeracy issues in the UK, the paper emphasizes the importance of a nuanced approach to education that moves beyond rote learning to address the underlying cognitive aspects of learning difficulties.

Research indicates the pivotal role of working memory in numeracy skills, challenging the misconception that difficulties in mathematics stem from low intelligence. The paper explores the unique cognitive profiles of individuals with dyscalculia, advocating for innovative, strength-based teaching methods.

The Davis Method emphasises "picture thinking" over traditional "word thinking." The Davis Maths Mastery Programme, through practical exercises and conceptual mastery, aims to foster a deeper understanding of mathematical fundamentals.

The paper presents case studies demonstrating significant improvements in individuals' mathematical abilities following the Davis Maths Mastery Programme. These examples underline the programme's potential to transform educational practices for individuals with dyscalculia. Further academic research could rigorously evaluate the effectiveness and applicability of the approach.

Keywords: Dyscalculia, Davis Method, Numeracy Skills, Working Memory, Learning Difficulties,

Understanding Dyscalculia

Unlike dyslexia, dyscalculia remains relatively underdiscussed. In the UK, dyscalculia falls under the umbrella of Specific Learning Difficulties (SpLD) and primarily manifests as a challenge with number sense.[2] However, not all mathematical difficulties are attributed to dyscalculia; some are related to other SpLDs or stem from external factors.

[1] Picture Thinking.Davis Dyslexia Specialist and Trainer, Davis Autism Approach Supervisor Director, Davis Learning Foundation
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[2] (SpLD Assessment Standards Committee, 2019)

The prevalence of numeracy difficulties in the UK is notable, with a 2011 report indicating that nearly half of UK adults possess numeracy skills expected of children aged 9 to 11.[1] According to an Ipsos MORI survey in 2019, a significant portion of the population avoids job opportunities requiring numerical proficiency, with a notable gender disparity in self-reported numerical anxiety and avoidance.[2]

Addressing numeracy challenges requires a nuanced approach. Educators may resort to temporary fixes, such as rote learning and mnemonics, to help students pass examinations without addressing underlying difficulties. A more constructive approach involves analysing the nature of the numeracy difficulties and leveraging a person's strengths to address their weaknesses, aligning with the ethos of not merely compensating for deficiencies but aiming for genuine comprehension and skill development.

Central to understanding dyscalculia and numeracy difficulties is the concept of working memory. Research suggests that working memory, rather than IQ, serves as a better predictor of numeracy skills. Studies have identified a strong link between working memory and numerical abilities, challenging the misconception that numeracy difficulties stem from low intelligence. [3]

Moreover, Rapid Automatised Naming (RAN), while closely linked to dyslexia, exhibits a different relationship with dyscalculia. Findings indicate that dyscalculia may involve specific challenges with naming quantities rather than a general slow naming speed.[4] This distinction underscores the complexity of dyscalculia, suggesting that interventions should focus on enhancing working memory and mastery of numerical concepts rather than improving speed or rote memorisation.

Academic and practical perspectives on dyscalculia converge on the importance of addressing the unique cognitive profiles of individuals with numeracy difficulties. Innovative teaching methods that transcend mere memorisation to embrace understanding and reasoning can significantly impact learners. Such approaches offer the potential for meaningful and lasting numeracy skill development.

Dyscalculia, like dyslexia, requires a thoughtful and informed approach to support. By shifting the focus from temporary coping mechanisms to strategies that build on an individual's strengths and address their specific challenges, educators and caregivers can help individuals with dyscalculia achieve their full potential in numeracy and beyond.

[1] (Department for Business, Innovation and Skills, 2012)

[2] (National Numeracy, 2019)

[3] (Kyttälä, Aunio, Lehto, Van Luit, & Hautamäki, 2003) (Kyttälä, Visuospatial working memory in adolescents with poor performance in mathematics: variation depending on reading skills, 2008) (Klein & Bisanz, 2000) (Witt, 2006) (Fanari, Meloni, & Massidda, 2019)

[4] (Guzmán, Rodríguez, Sepúlveda, & Ferreira, 2019) (Willburger, Fussenegger, Moll, Wood, & Landerl, 2008)

The Davis View of Dyscalculia

Ronald Davis takes a unique approach to understanding and addressing this learning difficulty.

The Davis Method distinguishes between "word thinking" and "picture thinking," where the latter is seen as a potent tool for individuals with dyscalculia. Picture thinking, characterised by thinking in sensory images, contrasts with the linear and sequential nature of word thinking. This cognitive style enables a rich, associative thought process, allowing individuals to excel in creative and imaginative tasks. However, in mathematics, which often requires linear and sequential thinking, the associative and lateral nature of picture thinking can complicate the learning process.

Davis' insights into dyslexia and dyscalculia shed light on the shared trait of picture thinking among individuals with these conditions.[1] Many who struggle with mathematics are creative and imaginative, sometimes displaying traits of impulsivity.

The concept of disorientation, as described by Davis, plays a crucial role in understanding the academic struggles of such individuals. Disorientation, a state in which the mind perceives its internal creations as reality, can disrupt the accurate perception of the external world. This phenomenon, while offering a rapid-response mechanism to sensory conflict, can lead to inconsistencies in learning and understanding, particularly in subjects like mathematics that demand precision, linear thought processes, and stability of focus.[2]

A marked struggle with understanding sequences, estimating durations, and organising personal spaces often accompanies mathematical challenges. These difficulties are rooted in an individual's heightened engagement with their imagination, which, while enriching their creative abilities, can detract from their interaction with the physical world governed by cause, effect, and order.

The Davis Method, through its recognition of these unique cognitive styles and challenges, advocates for approaches that leverage an individual's strengths, particularly their capacity for picture thinking. By employing creative and visual strategies, the method aims to bridge the gap between a dyscalculic individual's cognitive style and the demands of learning mathematics. This practitioner's experience is that tailored, empathetic, and imaginative teaching methods can unlock their potential and alleviate the difficulties associated with dyscalculia.

The Nature of Mathematical Thinking

Mathematical thinking rests on the fundamental concepts of cause, effect, time, sequence, and order—elements that underlie not only our physical reality but also the

[1] (Davis & Braun, 2003)

[2] (Davis & Braun, 2010)

abstract world of mathematics. In individuals with dyscalculia, these foundational concepts may not be fully mastered.

At the core of mathematical thought lies the concept of change and consequence, exemplified even in the simplest equations such as 2 + 1 = 3. This equation does more than just state a fact; it narrates a story of transformation from two to three, underscored by the action of addition. It encapsulates a before and after, placing it firmly within a temporal sequence. The success of solving this, and indeed any mathematical problem, hinges on the ability to maintain order among elements in their proper places and to follow a sequence of operations—principles deeply rooted in our understanding of the physical world.

Yet, the true essence of mathematics transcends mere calculation, as highlighted by mathematician P.R. Halmos.[1] Halmos argues that mathematics is a creative art, a form of intellectual expression that engages with the abstract concepts of time, sequence, and order to unravel problems in the most efficient and elegant ways possible.

The implications for education are profound. Teaching children to memorise answers might produce individuals capable of recall but not necessarily of understanding or innovation. In contrast, fostering an ability to think mathematically— to see beyond the numbers and grasp the conceptual frameworks that make mathematics a creative art—can cultivate a generation of problem solvers. Such an approach not only enriches the individual's intellectual life but also equips them to address complex challenges, thereby enhancing society's capacity for innovation and improvement.

Key Components of the Davis Maths Mastery Programme

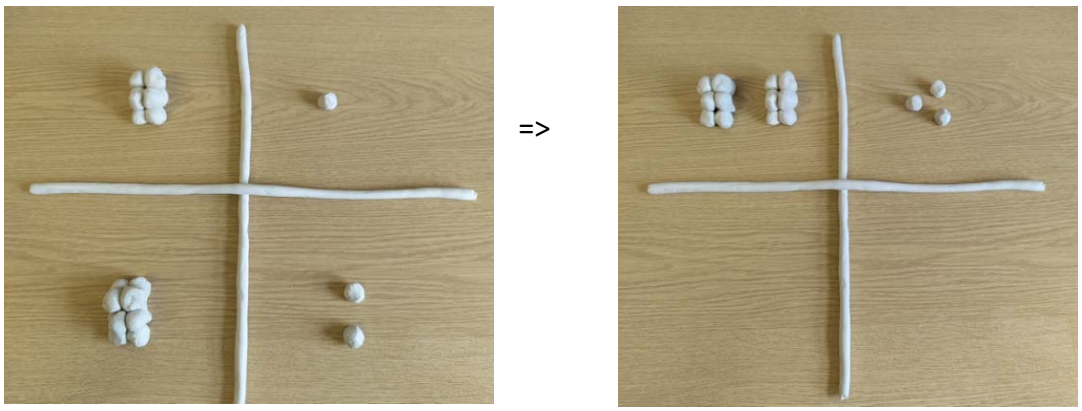
1. **Orientation and Focus:** Utilising Davis Orientation tools to improve attention, perception, and focus, which are critical for mathematical reasoning.
2. **Building Mathematical Thinking:** Utilising Davis Concept Mastery, a multisensory exploration of the following concepts: self, change, consequence, cause, effect, before, after, time, sequence, order/disorder. In white plasticine clay, the meaning and spelling of each concept is created by the participant, the concept for the clay model being devised by the participant themselves. After each concept has been made, it is "explored" in the environment: many simple examples of the given concept are identified in and around the premises where the programme is taking place. In this way, each concept is integrated into the participant's thinking apparatus, as a frame of reference for understanding the principles underlying any mathematical operation. Later in the programme, the relationship between each concept and mathematical axioms is revisited in the clay and rendered explicit.

[1] (Halmos, 1968)

Fig 1: a participant's depiction of *effect: something that is made to happen.* In the creative model, a flower is made to happen (by the participant planting a seed). In the equation model, 3 is made to happen (by adding 2 to 1).[1]

Fig 2: exploring the concept of time in a Davis Maths Mastery Programme using a globe and a table lamp. The lamp represents the sun; the programme Facilitator is walking round the table with the globe to demonstrate how the earth's orbit on a tilted axis creates the seasons.

3. **Understanding Number Sense:** Through practical exercises, including the use of plasticine clay to model quantities, numbers and mathematical operations, participants develop a tangible understanding of basic arithmetic and place value. A white plasticine ball is used as a generic, universal representation of the concept of 1. Clusters of balls are used to create 10s and, at one point, 100; a ball is rolled out and cut into 10 pieces, each of which represents 0.1; one of those pieces is cut to create 0.01, and the same is done again to represent 0.001. Combinations of individual balls and clusters of 10 balls are used to strengthen mental addition and subtraction, including carrying and borrowing, culminating in the participant using mental imagery in place of the clay to visualise these operations.



[1] Photo: Margot Young

Fig 3: the addition 11 + 12 = 23 as shown in plasticine clay. On the left are clusters of 10 balls each; on the right are individual balls. The participant performed the addition by physically moving 12 balls from below the horizontal line to above it.

Multiplication and division are explored on a 10 x 10 ball grid, with the use of plasticine clay ropes to section off and explore individual multiplication facts.

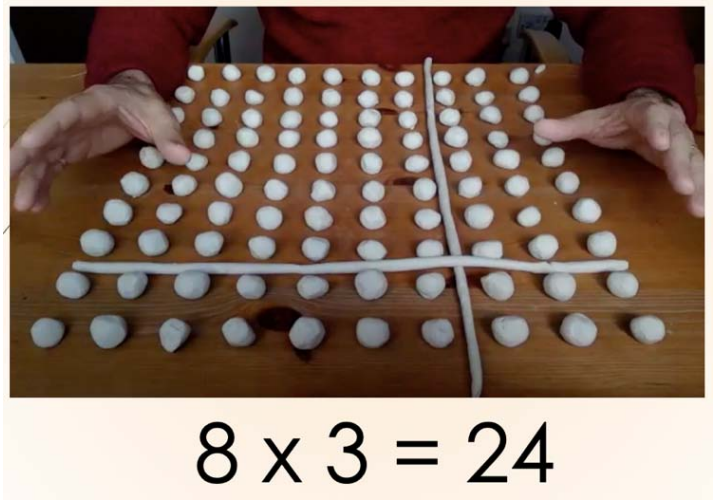


Fig 3: exploring the multiplication fact 8 x 3 = 24. The fact can be seen in the top right section of the ball grid, where ropes have been used to section off 24 balls in 8 rows and 3 columns.

4.

5. **Picturing, drawing and modelling for maths story problems:** a combination of plasticine clay, drawing, and visualisation is used to assist participants in conceptualising the mathematics required for each such story problem.

Davis Maths Mastery Programme Impact and Outcomes

The Davis Maths Mastery Programme has demonstrated significant success in helping individuals with dyscalculia to overcome their challenges. Here are three case studies from the author's own Davis practice:

Case Study 1: Enhancing Mathematical Competency in a Young Student Through Intensive Intervention

Background: In February 2022, a 12-year-old student, hereafter referred to as "the subject," demonstrated significantly below-average mathematical ability, scoring 22% on a Mathematics Common Entrance Trial Examination. The subject's goal was to gain admission to a preferred independent senior school, requiring a substantial improvement in mathematical performance within three months.

Assessment: In March 2022, the subject underwent a comprehensive evaluation by an educational psychologist, revealing exceptionally low proficiency in Number Operations, placed at the 2nd percentile.

Intervention: The subject participated in a 48-hour intensive Davis Maths Mastery Programme in April 2022.

Outcome: Following the intervention, the subject demonstrated marked improvement in numerical skills, including both mental and written arithmetic. In May 2022, the subject achieved a 65% score on the Common Entrance Examination for Mathematics, securing admission to the desired school.

Case Study 2: Transforming Mathematical Understanding in an Adult Learner Through Specialised Intervention

Background: In 2006, a 30-year-old individual, hereafter referred to as "the participant," aimed to pursue nursing education but was hindered by inadequate mathematical skills, evidenced by a 19% score on the Access to Nursing Mathematics test. An assessment to explore the possibility of dyslexia concluded a lack of dyslexia, attributing the low performance to limited overall intelligence.

Intervention: The participant engaged in a Davis Maths Mastery Programme. The 36-hour programme was spread over six weeks, with the intervention scheduled over six hours over a single day in each of the weeks.

Outcome: Post-intervention, the participant significantly improved her mathematical ability, passing the Access for Nursing Mathematics Test with over 60%. This remarkable improvement led to a re-evaluation of the initial assessment, resulting in a revised diagnosis that recognised the participant's dyslexia.

Case Study 3: Transforming Temporal Understanding in an Eleven-Year-Old Through Kinaesthetic Learning

Background: The intervention is a part of the Davis Concept Mastery process, which facilitates the mastery of abstract concepts through practical, hands-on activities.

Intervention Procedure: The intervention involved a sequence of structured activities centred around tactile and visual learning tools, including clay, a ruler, a globe, and a lamp. The boy was guided through a series of tasks designed to deepen his understanding of various time-related concepts, such as:

1. **Measuring Lengths:** Using clay to create a model rope and a ruler to introduce the concept of units of measurement and the importance of standards. This activity served as an analogy for understanding units of time.
2. **Modelling Change:** The boy created a before-and-after scene using plasticine to visualise the concept of change over time. This exercise was designed to help him grasp how time can be measured and understood through observable changes.
3. **Understanding Earth's Rotation:** A globe and a lamp were used to simulate the earth's rotation and its implications for day and night cycles. This hands-on demonstration helped the boy link physical phenomena with the abstract concept of time, enhancing his comprehension of why certain times of day occur.

Impact: The intervention had a profound effect on the boy's perception and awareness of time. Before the session, his experience of time was minimal; he lived "in the now".

After the intervention, he demonstrated a keen understanding of time's passage, applying this new knowledge during a family holiday by actively counting down the remaining days and hours. This newfound temporal awareness marked a significant shift.

The boy's mother reports that his enhanced awareness of time has not only maintained but strengthened over the two years since the intervention.

Conclusion

This paper offers a comprehensive examination of an alternative approach to addressing specific learning difficulties. When a theoretical understanding of mathematics, empirical research findings, and practical application are synthesised, a compelling argument for rethinking educational strategies for individuals with dyscalculia emerges. The case studies presented not only demonstrate marked improvements in mathematical understanding and skills among participants of the Davis Maths Mastery Programme but also highlight the transformative potential of personalised, multi-sensory, and conceptual learning experiences on life skills such as time awareness and management.

The paper argues convincingly for the adoption of innovative teaching methods that transcend traditional, linear educational paradigms, advocating instead for approaches that leverage the strengths and inherent cognitive styles of learners. The Davis Method, with its emphasis on 'picture thinking' and the use of tangible, creative tools like plasticine clay, emerges as a strategy that aligns with the learning preferences of individuals with dyscalculia, thereby facilitating a deeper, more intuitive grasp of mathematical concepts.

By examining the importance of addressing specific cognitive challenges—such as those related to working memory and the processing of sequential information—the study underscores the need for educational interventions that are both targeted and tailored to the individual.

The success stories detailed in this paper, drawn from the author's practice and supported by a broader context of academic and practical insights, serve as a compelling case for further, rigorous investigation into the Davis Maths Mastery Programme by the academic community. As educators and caregivers seek more effective ways to support individuals with dyscalculia, the insights offered here provide valuable guidance, advocating for a shift from coping strategies to comprehensive, strength-based educational approaches that unlock the full mathematical capabilities of learners.

References

Alloway, T., & Alloway, R. (2010). Investigating the predictive roles of working memory and IQ in academic attainment. *Journal of Experimental Child Psychology, 106*(1), 20-29.

British Dyslexia Association. (2023). *Dyscalculia*. Retrieved August 31, 2023, from https://www.bdadyslexia.org.uk/dyscalculia

Davis, R. D., & Braun, E. M. (2003). *The Gift of Learning: Proven New Methods for Correcting ADD, Math & Handwriting Problems.* New York: TarcherPerigee, 2003.

Davis, R., & Braun, E. (2010). *The Gift of Dyslexia: Why Some of the Brighest People Can't Read and How They Can Learn* (3rd Revised Edition ed.). London: Souvenir Press.

Department for Business, Innovation and Skills. (2012). *The 2011 Skills for Life Survey: a Survey of Literacy, Numeracy, and ICT Levels in England.* London: Department for Business, Innovation and Skills (UK).

Engelbrecht, R. J. (2005, April). *The effect of the Ron Davis programme on the reading ability and psychological functioning of children.* Retrieved August 31, 2023, from http://bin.ddai.us/dys/docs/Engelbrecht-2005-Masters-Thesis.pdf

Fanari, R., Meloni, C., & Massidda, D. (2019). Visual and Spatial Working Memory Abilities Predict Early Math Skills: A Longitudinal Study. *Frontiers in Psychology, 10*.

Gross-Tsur, V., Manor, O., & Shalev, R. (1996). Developmental dyscalculia: prevalence and demographic features. *Developmental Medicine and Child Neurology, 38*(1), 25-33.

Guzmán, B., Rodríguez, C., Sepúlveda, F., & Ferreira, R. A. (2019). Number Sense Abilities, Working Memory and RAN: A Longitudinal Approximation of Typical and Atypical Development in Chilean Children. *Revista de Psicodidáctica, 24*(1), 62-70.

Halmos, P. (1968). Mathematics as a Creative Art. *American Scientist, 56*(4), 375-389.

Harding, C., Romanou, E., Williams, J., Peters, M., Winkley, J., Burke, P., . . . Shay, M. (2012). *The 2011 Skills for Life Survey: A Survey of Literacy, Numeracy and ICT Levels in England.* London: Department for Business, Innovation and Skills (UK).

Klein, J. S., & Bisanz, J. (2000). Preschoolers Doing Arithmetic: The Concepts Are Willing but the Working Memory Is Weak. *Canadian Journal of Experimental Psychology, 54*(2), 105-116.

Kyttälä, M. (2008). Visuospatial working memory in adolescents with poor performance in mathematics: variation depending on reading skills. *Educational Psychology, 20*(3), 65-76.

Kyttälä, M., Aunio, P., Lehto, J., Van Luit, J., & Hautamäki, J. (2003). Visuospatial working memory and early numeracy. *Educational and Child Psychology, 20*(3), 65-76.

National Numeracy. (2019). *Numerate Nation? What the UK thinks about numbers.* Brighton: National Numeracy.

Nunes, T., Bryant, P., Barros, R., & Sylva, K. (2012). The relative importance of two different mathematical abilities to mathematical achievement. *British Journal of Educational Psychology, 82*(1), 136-156.

SpLD Assessment Standards Committee. (2019, November). *SASC Guidance on assessment of Dyscalculia and Maths Difficulties within other Specific Learning Difficulties.* Retrieved August 30, 2023, from https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjcvZWt5ISBAxX5S0EAHZzACOoQFnoECA0QAw&url=http%3A%2F%2Fwww.sasc.

org.uk%2Fmedia%2F3gtdmm0s%2Fassessment-of-dyscalculia-maths-sasc-nov-2019.pdf&usg=AOvVaw3TnpkDZxTGXzmAlWlIL8_M&opi=899

Trauzettel-Klosinski, S., Dietz, K., & Group, t. I. (2012, August). Standardized Assessment of Reading Performance: The New International Reading Speed Texts IReST. *Investigative Ophthalmology & Visual Science, 53*, 5452-5461.

Willburger, E., Fussenegger, B., Moll, K., Wood, G., & Landerl, K. (2008). Naming speed in dyslexia and dyscalculia. *Learning and Individual Differences, 18*, 224–236.

Witt, M. (2006). Do Different Mathematical Operations Involve Different Components Of The Working Memory Model? *Proceedings of the British Society for Research into Learning Mathematics, 26*(3), 65-70.

LD and Student Voice India

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Abstract

International data suggests that school attendance problems are increasing and students with learning difficulties are at higher risk of school non-attendance. Research into school avoidance (SA) has traditionally focused on the evaluating interventions from the perspectives of the clinical or educational professionals undertaking the implementation. There has been scant research conducted on the voices of young people being directly impacted. This article presents the voices of 46 young people attending a school avoidance intervention called In2School. The students completed a self-report questionnaire that included information about their experiences of school and barriers and facilitators to school attendance. While no students in the sample had a formal diagnosis of a learning disability, seventy-three percent (n=33) of the students reported learning needs that are consistent with those who have learning difficulties, particularly difficulties with executive functioning, and these required reasonable adjustments. Qualitative data were analysed using thematic analysis and this paper reports on one domain from the questionnaires, that of learning needs. Findings suggest that students know what they need to support their return to school with barriers also being identified. School and allied health staff can use this to better develop strategies to support students with learning difficulties and facilitate a graduated return to school.

Introduction

The rates of students not attending school regularly is a growing concern in Australia. Recent Australian data suggests that school attendance has been gradually declining (Productivity Commission, 2020). In 2023 while the overall attendance rate for students in years 1-10 was 88.6%, the number of students attending 90% or more of the time was only 61.6% (Australian Curriculum Assessment and Reporting Authority, 2024). School attendance problems (SAPs) contribute to the loss of valuable educational opportunities and students may find it difficult to maintain relationships with peers and school staff.

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Research suggests that students with disability and learning difficulties are at higher risk of SAPs (Gottfried et al., 2019). A longitudinal study examined attendance data from elementary schools in the USA (Gottfried et al., 2019). Of the 16.5% of students with an identified disability in the sample, learning disabilities accounted for 39.9% of this group. Of the learning disabilities cohort 43.2% experienced chronic absenteeism, though the type of attendance problem was not defined (Gottfried et al., 2019). In another report examining eight school districts in California, Gee et al., (2020) found 45.3% of students had a learning disability. Analysis of attendance data showed that 17% of this group were chronically absent, with the highest incidence of absence being in years 9-12 (Gee et al., 2020).

This paper focuses on a group of students who meet criteria for one specific typology of SAP, that of school avoidance. School avoidance (SA: also known as school refusal) is a type of SAP characterised by severe emotional distress associated with school attendance (Berg, 1997). Typically, youth showing signs of SA do not try to conceal their absence from their families (Berg, 1997), indeed parents are noted to have made reasonable efforts to get youth to school (Heyne et al., 2019). In addition, a criterion for SA indicates that youth do not show severe signs of anti-social behaviour apart from resistance to parental attempts to secure attendance (Heyne et al., 2019).

International research highlights links between SA and learning disabilities. Students with learning difficulties/disabilities are more likely to present with school avoidance than those who have higher levels of academic achievement (Filippello et al., 2020). More specifically this avoidance is linked to higher levels of escaping adverse social/performance situations and attention-getting from caregivers (Filippello et al., 2020). Jabeen and Rauf (2023) also found that students with learning disabilities had higher levels of anxiety and school avoidance when compared with non-learning disabled peers. This aligns with research by Heyne, et al.,(2015) who note that many youth with SA meet diagnostic criteria for an anxiety or depressive disorders.

The In 2 School Program and Student Voice.

The In 2 School program is a multidisciplinary pilot program developed in response to an increase in SA based referrals to a mental health focused, special education setting in Victoria, Australia. The program runs via a partnership between three organisations, Travancore School, The Royal Children's Hospital Melbourne Mental Health and The University of Melbourne. The initial piloting of the In2School program has been described in detail elsewhere (McKay-Brown et al., 2019).

Within the In2School program, student voice is central to the interventions providd, with students actively contributing to and guiding the educational and therapeutic responses. The aim of this paper is to explore the experiences of students with learning difficulties and how these may have contributed to their non-attendance at school. The questions we sought to answer within this paper were: (1) What types of learning difficulties do In2School students report that contribute to their difficulty in attending

school? and (2) What do In2School students report they need to support their learning upon their return to school?

Method

The students participating in this study were attending the In2School program, a three-phase intervention to support students who are school refusing to return to school (McKay-Brown et al., 2019). This paper focuses on information gathered during the first phase of the program. After gaining informed consent, baseline assessment was undertaken in mental health and social functioning, quality of life, self-efficacy, function of school refusal and educational needs. The self-report questionnaire being reported on in this paper was administered during this time. For a full description of the three phases of the program see McKay-Brown et al (2019).

Participants

The participants were 46 students who were attending the In2School program from June 2015 to March 2019. Inclusion and exclusion criteria for this program has been described elsewhere (McKay-Brown et al., 2019)

Participants were aged between 11 and 14 years (*M*=13.05, *SD*=1.02) and all lived in Victoria, Australia. Fifteen were male, 27 female and four identified as gender diverse. The participants had been having trouble attending school for varied lengths of time from three months to two years (*M*=12.08 months, *SD*=8.24 months). At the time of completing the survey, six were attending school 3-4 days per week, four were attending 2-3 days per week, six were attending 1-2 days per week, two were attending less than one day per week and 28 were not attending at all.

Ethical Approval

This study was approved by the Human Research Ethics Committees of the Royal Children's Hospital and The University of Melbourne. Approval to conduct research in schools was received from the Department of Education, Victoria.

Self-Report Questionnaire

The data being presented in this paper is one measure collected as part of the larger study (McKay-Brown et al., 2019). The self-report questionnaire was designed by the research team to gather information that would support the development of an Individual Education Plan (IEP) for each student. Included in the IEP was information about past attendance, difficulties with school attendance, any learning or other difficulties identified and academic and social/emotional learning goals.

Data Analysis

The responses to the self-report questionnaire were exported from SurveyMonkey™ and participant names were de-identified and replaced with identifiers that linked to the intake in which the student participated (for example, intake 2 was named 2) and the student (for example A, B, C, etc.). The responses from the questionnaire were

distributed to each author and were thematically analysis using the process described by Braun and Clarke (2006). The responses of the participants were coded individually by each of the authors and grouped into themes and sub-themes. Once the individual coding was completed, the authors compared results and finalised the themes and sub-themes for use in this paper. This process was used to provide some level of inter-rater reliability.

Results

Analysis of the student voice data highlighted four major themes regarding the reasons keeping students away from school as well as what they would need to be able to attend school. The themes of school climate, learning, social relationships and wellbeing described the most frequently given responses. This paper will report on the learning theme.

Seventy three percent (*n*=33) of young people indicated that learning had in some way contributed to their worry about school or their difficulties in attending. General worries about schoolwork were noted in comments such as “I will worry about my class work” (3A) and “I worry about schoolwork being too hard” (6C). Furthermore, two students remarked that pressure to “complete the work on time” (2G) and to “do assessments and tests by [the] due date” (6B) made it difficult for them to attend school. Homework was noted by two students as a source of worry. Eleven students simply noted specific subjects as explanations for the learning challenges they faced with all citing maths and/or physical education as concerns.

Another aspect of learning that was raised by students was difficulties with and worries about maintaining concentration and attention. Among the responses collected from different students were “I find it hard to concentrate” (5E), “struggling to stay on task” (7D), “paying attention” (7E), “paying attention to classes such as Math and English” (6E) and “concentration [and] memory” (2H). Difficulty understanding instructions and difficulties asking for help were also noted. One student commented that “understanding instructions” and “trouble learning” (5C) were among the challenges they faced while another student reported “asking for help when I have no idea what’s going on” (7G) as a challenge. Some of the worries associated with learning were also stated by another student “I have to ask for lots of help for it to make sense and it makes me think that I’m not smart” (4D). Another student found it difficult “to show what you know, because even though I have a lot of knowledge when it comes to my mind it’s hard for me to really show it” (6A). Two students remarked that their difficulties with schoolwork were related to time spent away from school. One stated “I have missed out on a lot of school and need a lot of learning” (3E) while the other worried about “falling behind on schoolwork” (2H).

Students, who discussed difficulties and worries with learning, also provided answers regarding what might help. For example, the student who wrote of feeling under pressure in different situations noted “build[ing] confidence and self-esteem" (6B) as something that would help, while the student who wrote of difficulties in completing

work on time noted that "slowly starting and not rushing" (2D) would help them in a return to school. Other young people reported that "if someone helped me understand the work" (5C), "if the work was manageable" (6C) and being given time to "[catch] up on school-work" (2H) would provide necessary supports. Using a range of instructional practices, such as working in a group "it's better when I'm in groups as there are a lot of people who might understand what to do" (5A), and scaffolding, "easy work and then maybe a little bit harder" (4E) would be of some help in returning to school.

Discussion

The student responses noted a range of difficulties with learning. While the students in this sample did not have a learning disability diagnosis, the difficulties they noted align with those experienced by students with learning disabilities and difficulties. Research also notes that these terms are often used interchangeably (Thomas & Whitten, 2012). Certainly, their difficulties were impacting their ability to engage in academic learning and based on the self-report data, contributed to their SA. Our findings suggest that learning difficulties, in particular understanding the expectations of certain tasks, having the skills necessary to solve problems they encountered and thinking they are "not smart", were barriers to school attendance. This aligns with research conducted by Filippello et al., (2020) that noted students with learning difficulties may try to avoid school to escape from situations where they might be embarrassed or shamed by their academic performance. Help seeking was another aspect of their difficulties with learning that impacted students which in turn led to feelings of not coping in school. This aligns with research by Leduc et al., (2022) that underlying worries about schoolwork may lead to maladaptive coping mechanisms.

Students also reported an inability to process information and maintain attention in class. This, along with the other difficulties noted, led to feelings of failure and students not wanting to look like they were struggling with learning. Maric et al. (2012) noted that self-deprecating thoughts and negative feelings around learning may be common in those who are unable to attend school.

Students expressed a range of supports that would help them manage their learning difficulties upon their return to school. Introducing low stakes tasks and reducing time pressures around task completion are useful strategies. Scaffolding learning tasks and using explicit teaching to introduce and teach content to students are important considerations for students with learning difficulties, as is 1:1 support when required. Learning and supports for helpseeking, self-regulation and management were also appreciated by students. Using these metacognitive strategies can help students with learning difficulties access and engage with academic tasks successfully (Mastrothanais et al., 2018). Research also suggests that students with learning disabilities/difficulties are less likely to use metacognitive strategies than students without learning disabilities/difficulties (Mastrothanais et al., 2018) so including these in learning programs is recommended.

Limitations

This is a small-scale study that relied on student self-report to ascertain learning difficulties. As students did not have a formal diagnosis of learning disability/difficulty these results do need to be interpreted with care. Future research could include semi-structured interviews and formal assessment of learning difficulties.

Conclusion

In conclusion, learning difficulties can be a risk factor for school avoidance. Listening to students and using student voice is central to ensuring that interventions and supports are targeted to the needs of the young person. It is important to screen students for early warning signs of school avoidance and academic risk. Universal Design for Learning and high impact teaching strategies including explicit teaching, goal setting, worked examples, collaborative learning, metacognitive strategies and differentiated teaching can ensure that programming for students with learning difficulties supports attendance and minimises anxiety around schooling and particularly academic learning.

References

Australian Curriculum Assessment and Reporting Authority. (2024). *ACARA National Student Attendance Data Collection*. Australian Curriculum, Assessment and Reporting Authority. Retrieved March 25 from https://www.acara.edu.au/reporting/national-report-on-schooling-in-australia/student-attendance

Berg, I. (1997). School refusal and truancy. *Archives of Disease in Childhood*, *76*(2), 90-91. https://doi.org/10.1136/adc.76.2.90

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77-101. https://doi.org/10.1191/1478088706qp063oa

Filippello, P., Buzzai, C., Messina, G., Mafodda, A. V., & Sorrenti, L. (2020). School refusal in students with low academic performances and specific learning disorder. The role of self-esteem and perceived parental psychological control. *International Journal of Disability, Development and Education*, *67*(6), 592-607. https://doi.org/10.1080/1034912X.2019.1626006

Gee, K., Beno, C., & Witte, J. (2020). *Students with disabilities in the CORE districts: Characteristics, dutcomes, and transition*. Policy Analysis for California Education.

Gottfried, M. A., Stiefel, L., Schwartz, A. E., & Hopkins, B. (2019). Showing up: Disparities in chronic absenteeism between students with and without disabilities in traditional public schools. *Teachers College Record*, *121*(8), 1-34. https://eric.ed.gov/?id=EJ1222400

Heyne, D. A., Sauter, F. M., & Maynard, B. R. (2015). Moderators and mediators of treatments for youth with school refusal or truancy. In M. Maric, P. J. M. Prins, & T. H. Ollendick (Eds.), *Moderators and mediators of youth treatment outcomes* (pp. 230-266). Oxford University Press.

Heyne, D., Gren-Landell, M., Melvin, G. A., & Gentle-Genitty, C. (2019). Differentiation between school attendance problems: why and how? . *Cognitive And Behavioral Practice*, *26*(1), 8-34. https://doi.org/10.1016/j.cbpra.2018.03.006

Jabeen, T., & Rauf, K. (2023). Predicting Relationship between Anxiety and School Avoidance in Children and Adolescents with and without Learning Disabilities in Educational Setups in Pakistan: A Comparative Study. *Journal of Education and Educational Development*, *10*(2), 251-269.

Leduc, K., Tougas, A. M., Robert, V., & Boulanger, C. (2022). School Refusal in Youth: A Systematic Review of Ecological Factors. *Child Psychiatry & Human Development*.

Maric, M., Heyne, D. A., de Heus, P., van Widenfelt, B. M., & Westenberg, P. M. (2012). The role of cognition in school refusal: an investigation of automatic thoughts and cognitive errors. *Behavioural And Cognitive Psychotherapy*, *40*(3), 255-269. https://doi.org/10.1017/S1352465811000427

Mastrothanais, K., Kalianou, M., Katsifi, S., & Zouganali, A. (2018). The Use of Metacognitive Knowledge and Regulation Strategies of Students with and without Special Learning Difficulties. *International Journal of Special Education*, *33*(1), 184-200.

McKay-Brown, L., McGrath, R., Dalton, L., Graham, L., Smith, A., Ring, J., & Eyre, K. (2019). Reengagement with education: A multidisciplinary home-school-clinic approach developed in Australia for school-refusing youth. *Cognitive And Behavioral Practice*, *26*(1), 92-106. https://doi.org/10.1016/j.cbpra.2018.08.003

Productivity Commission. (2020). *Report on Government Services 2020*. A. Government. https://www.pc.gov.au/research/ongoing/report-on-government-services/2019/child-care-educationand-training/school-education

Thomas, G., & Whitten, J. (2012). Learning support for students with learning difficulties in India and Australia: Similarities and differences. *International Education Journal: Comparative Perspectives*, *11*(1), 3-21.

Nonverbal Learning Disability (NVLD)

D Venkateshwarlu[1]

Nonverbal Learning Disability (NLD) is a neurodevelopmental disorder characterized by unique strengths and challenges, often associated with right hemisphere brain dysfunction. People with NLD typically have strong verbal abilities but may face difficulties with nonverbal aspects such as spatial awareness, visual processing, and understanding social cues. This condition is marked by core deficits in visual-spatial processing and a notable discrepancy between verbal and nonverbal intelligence, with the former being superior.

NLD impairs the ability to process nonverbal or visual information, typically associated with the right hemisphere of the brain. This hemisphere integrates information from various sources simultaneously, forming a unified understanding of situations. In individuals with NLD, dysfunction in this region hampers their ability to combine these elements effectively. Although NLD remains constant over time, its effects can seem more pronounced as individuals encounter increasing demands for abstract reasoning and complex comprehension.

NLD is often misunderstood, misdiagnosed, or overlooked. Its identification is challenging because NLD symptoms can resemble those of other disorders, such as ADHD, Autism Spectrum Disorder (ASD), and Dyscalculia. Additionally, comorbidity—the occurrence of multiple disorders simultaneously—adds complexity, as NLD may coexist with other conditions. This overlap in symptoms and the wide range of affected areas make accurate diagnosis difficult.

Characteristics of children with NLD includes problems in social perception, inferential reasoning and in arithmetic. They are unable to comprehend the significance of many aspects of their environment. They have difficulty in interpreting the meaning of others' actions, gestures, and facial expressions, In short, have trouble "reading between the lines". For example, if someone says, 'just a minute', we think they will be with us shortly. For a student with Nonverbal Learning Disability this means exactly 60 seconds.

They have Poor motor coordination- difficulty in maintaining balance and fine motor skills, Visuo- spatial abilities- an ability to understand spatial relations, Nonverbal communication- inability to use and understand body language, Nonverbal problem-solving abilities, and Poor arithmetic skills.

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The research indicates that verbal intelligence is better than performance/executive intelligence. High/above average performance in vocabulary, similarities, and information (verbal intelligence) and below average /poor performance in nonverbal areas —block design and object assembly (visuospatial intelligence).

Visuo constructive impairments in all applied tests figure copying and object assembly. Impairment is striking. Inefficiency in Visuospatial Working Memory (VSWM) requiring generation of mental images. Good reading decoding ability but difficulties with inferential reasoning and abstract ideas.

Individuals with NLD generally remember arithmetic facts well but struggle with visuospatial aspects of mathematics. They may make errors with column alignment, calculations involving borrowing or carrying, and face challenges with reasoning and problem-solving. Their difficulties stem from specific processes, notably Visuospatial Working Memory (VSWM), which is essential for accurate calculation. As a result, they often show weaker performance in written calculations and number ordering tasks. Socially, they may appear shy and exhibit interaction and communication difficulties, which can further impact their social and academic experiences.

Academic Difficulties

In early years of school, they may have trouble with numerocity, telling time, handling money, and greater-than and less-than relationships. In later years they may have problems translating fractions to decimals and associated procedures, Identifying, and describing geometric shapes and reading graphs and charts.

They may have trouble with certain language-based tasks in school that require understanding the big picture or solving new problems. For example, beginning in 3$^{rd.}$ or 4th grade, they may have trouble with reading comprehension, as opposed to in earlier years when the focus was on sounding out words and the structure of stories. They may also have a hard time answering inferential questions about literature.

They may have problems in interpreting metaphors and understanding multiple meanings of words in a text. For example, 'Here words were a knife in his heart'. They may also have difficulty writing essays and trouble in identifying information and evidence that supports their point of view or thesis.

Lack of aptitude and proficiency in arithmetic, reading comprehension, spelling difficulties with concept formation, problem solving and transferring learning from one situation to a new situation. Word recognition and sight-reading are strong but not overall reading comprehension. May tell you the story but not be able to describe the main point the main conflict or the major theme.

Handwriting is arduous and spelling errors are limited. As the child moves into secondary level science becomes very difficult because of the demand for more abstract thinking and to apply learning to new situations.

Principles of Intervention

- Correcting underlying biological defects
- Developing neurological process (perception, reception, association, memory)
- Developing academic skills
- Effective interventions for NLD include direct instruction, strategy instruction, and appropriate adaptations

For Associated Spatial Perception Problems

- Reducing novelty in a situation by reminding students of strategies they use to handle similar problems or similar circumstances
- Providing explicit verbal instruction for anything that requires understanding a part/whole relationship
- Reducing amount of visual stimulus on a page

For Associated Attention Problems

- Visual contact to check if the student is listening
- Repeating a predetermined 'alerting' word that instructions are coming next
- Movement breaks
- Seating with limited visual distractions

For Associated Motor Problems

- Explicit instruction (with repetition) when teaching a motor skill
- the fun way to master handwriting skills
- Keyboarding instruction
- Occupational Therapy

For Associated Executive Function Problems

- Samples of how to solve novel problems
- Develop a repertoire of approaches to a problem when something looks unfamiliar
- Practice learning the material in many ways such as by labeling it, drawing it, answering questions about it

For Associated Writing Problems

- Graphic organizers (concept maps, flow charts, outlines, etc.)
- When necessary, allow students to type written assignments or even use voice recognition software such as Talk To Type instead of handwriting

For Associated Math Problems

- Use language to describe every step explicitly
- use their verbal skills to narrate all math procedures

- sample problems on top of homework (or a test)
- Use consistent spatial arrangement of items in math problems

Academic functioning

To support students with Nonverbal Learning Disability (NLD), here are effective instructional and developmental strategies:

1. **Direct/Explicit Instruction**: Use clear, structured teaching methods to help students grasp new information more effectively.
2. **Assistive Technology Training**: Provide specific instruction on assistive technology tools suited to their needs.
3. **Task Segmentation**: Break tasks into smaller, manageable parts to improve focus and completion.
4. **Detailed Explanations of Abstract Ideas**: Simplify and thoroughly explain abstract concepts to aid understanding and recall.
5. **Private Speech Development**: Teach students to use self-talk for guiding, initiating, and sustaining tasks.
6. **Self-Monitoring Techniques**: Encourage self-monitoring to reduce inattention and impulsivity.
7. **Adapted Physical Education**: Suggest functional activities like swimming, yoga, and walking or involve occupational therapy to develop essential perceptual and motor skills for group sports.
8. **Individual Sports Recommendation**: Encourage participation in individual sports such as karate or track and field, which can boost confidence and align with their strengths.

These tailored strategies can enhance both the learning experience and personal growth of students with NLD.

Adaptations to Assessment

To support students with Nonverbal Learning Disability (NLD) in academic settings, educators can implement the following accommodations and strategies:

1. **Opportunities for Reading Aloud**: Allow students to read aloud during tests, which can improve comprehension and reduce errors.
2. **Access to a Scribe**: Provide a scribe during tests to assist with written responses, helping reduce the impact of visuospatial challenges.
3. **Extended Time**: Offer additional time for assignments and tests to accommodate processing and organizational needs.

Students with NLD are motivated to learn, fit in, and succeed. By using direct and explicit instruction, educators can help these students identify effective learning strategies, address specific challenges, and capitalize on their strengths. This support fosters a positive learning environment and empowers students with NLD to thrive academically and socially

References

1. Nonverbal learning disorder - Wikipedia
2. module on NVLD.pdf
3. NVLD Home | The NVLD Project | Non-Verbal Learning Disability

Integrated Supportive Intervention System for Students with Specific Learning Disabilities

Vinay Kumar Singh[1]

Abstract

Supportive Intervention System is a crucial aspect of education integrating learning and therapies for students with specific learning disabilities. The primary goal is prevention, therapeutic care, remediation and enhancing overall well-being, and minimizing complications associated with specific conditions. This approach addresses the diverse needs of students with SLD to improve their overall functioning in holistic manner, specifically in physical, developmental, cognitive, socio-emotional, or behavioural domains. These interventions may have many forms, ranging from clinical therapies to psychological interventions. Supportive interventions, mainly occupational therapy, speech and language therapy, positive behaviour intervention system (PBIS) and counselling involve a structured approach to understanding, addressing, and reinforcing the different aspects involve in holistic development of Students with SLD. This paper explores integrating the various supportive intervention measures in education of children with SLD in an inclusive classroom. By integrating these supportive interventions in an inclusive classroom, nurturing environment can be created that not only addresses academic challenges but also fosters the overall well-being and development of students with SLD. This approach reflects a commitment to inclusivity and the recognition that every student has unique strengths and needs.

Keywords: Specific Learning Disabilities, Supportive Intervention, Occupational Therapy, Speech and Language Therapy, positive behaviour intervention system, Inclusive Education

Introduction

Learning activities within the classroom and beyond foster changes in attitude, appreciations, knowledge, skills, and behavioural patterns of children that help them to

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interact with their immediate surroundings skilfully. These activities not only help to develop individual potentials and talent, but enhance their skills in language, motor abilities and socialization. Learning language, numeracy, science, arts, music and dance, crafts, sports, games, physical exercises, yogas, vocational skills etc. help in holistic development of a child, can be categorized into three major developmental domains like (a) physical, motor and perceptual development, (b) behaviour, personality and affective development, and (c) intellectual, cognitive and language development. Learning becomes enjoyable, if children are given choices to pursue activities of their own interest and get opportunities to explore, manipulate and experiment with the learning materials available in their surroundings. These activities help the children to re-examine their own potential, develop motivation and skills to participate and formulate new perspectives about learning environments.

Children learn with their own interest, motivation, pace and style. There are some children who despite getting assistance from the teachers and parents do not perform well, continuously struggle with their learning tasks and continue to deteriorate as they move up to higher classes. They may be unable to read or spell or write correctly, they may be facing difficulties in simple mathematical operations, may have trouble remembering instructions, order of routine activities, patterns, rules etc., may be writing alphabets and words in reverse order, may be answering well orally but not able to write the answers, unable to complete their work, have illegible handwriting, may not have friends and so on. They try to escape from learning activities. They may have learning disabilities. The Rights of Persons with Disabilities Act 2016 has articulated learning disabilities as Specific Learning Disabilities (SLD) "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". It is a neuropsycholgical processing disability that affects reading, writing, calculation and mathematics, perceptual-motor coordination, language and socio-emotional aspects of developing children though these children follow a similar developmental pattern as their peers. They face difficulties in learning and may not achieve at levels commensurate with their peers.

The range of individual abilities and interests for various learning activities among these children is often inconspicuous in nature, which needs to be identified through explorations. They manifest a variety of difficulties that require extensive instructional assistance from professional experts. The complex skills, which are taught in readymade settings, are often found difficult by them to perform in natural settings. They need training for transferring of skills. They need to acquire variety of skills, values and attitudes in order to interact effectively in a variety of settings and with a variety of people. Creativity, productivity, adaptability and compatibility are the main ingredients towards development of these. The coordination among cognitive, affective and psychomotor functioning in children with learning disability are affected which needs to be intervened through a variety of activities. Because of their learning disability, greater

attention is required for skill development having specificity and preciseness. Supportive intervention work to minimise the added stress (Maajeeny, 2019) of being in a structured environment, providing calm and adaptive teaching and learning environments. If supportive interventions are integrated into the classroom learning activities (Scott, et al, 2011 & Simpson, et al, 2011) based on the backgrounds and experiences of the children, this will create a sense of psychological safety. This approach identifies and meets their physical, psycho-social, emotional and communication needs of children, and as a result helps to lower stress and overstimulation, they are in a better place to learn.

Supportive intervention programmes mainly occupational therapy, speech and language therapy, positive behaviour intervention system (PBIS) and psychological counselling services have pivotal role in overall intervention and remediation of learning difficulties faced by children with SLD. The primary goal is prevention, therapeutic care, remediation and enhancing overall well-being (Chrystal & Luciano, 2007 & Long et al., 2007), and minimizing complications associated with specific conditions. This approach addresses the diverse needs of students with SLD to improve their overall functioning in holistic manner. These interventions may have many forms, ranging from clinical therapies to psychological interventions. Supportive interventions are provided to understand, address, and reinforce the different aspects involve in holistic development (Long et al., 2007) of Students with SLD. This paper explores integrating the various supportive intervention measures in education of SLD in an inclusive classroom. By integrating these supportive interventions in an inclusive classroom, nurturing environment can be created that not only addresses academic challenges but also fosters the overall well-being and development of students with SLD. This approach reflects a commitment to inclusivity and the recognition that every student has unique strengths and needs.

Objectives:

- To explore the nature and extent of supportive intervention measures being practices with children with Specific Learning Disabilities to improve their overall functioning.
- To suggest an integrated system of supportive interventions to address challenges faced by children with SLD in different learning activities in the classroom and beyond.

Research strategies: This was clinical-cum-classroom practise based semi-structured experiential study in which the supportive intervention measures like occupational therapy, speech and language therapy, Positive Behaviour Intervention and Support (PBIS) and counselling services were provided to 32 children with SLD separately in a clinical setup referred from different schools. Children selected were studying in middle stage (class-VI to VIII) of schooling. They were assessed thoroughly using Therapeutic Needs Assessment Schedule (TNAS) separately by respective therapists. A self-designed, clinic-based, bilingual 90-items behavioural checklist with rating options of ‘Never-0’,

'Low-1' and 'High-2' was used by the psychologist for identification of most occurring challenging behaviour, behavioural assessment schedule for assessing the frequency and duration of the targeted behaviour and parental report related to the challenging behaviour were also used as research tools. Interventions had been provided to children by respective therapists (Occupational therapist, Speech therapist, Psychologist and Counsellor) for 6 months in separate clinical setups. Parents mediated intervention approach was adopted. The therapeutic activities were then carried out by six trained special education teachers (SETs) in the clinical setups for three months under the supervision of the therapists. The SETs prepared therapeutic activities log for individual child in consultation with the therapists. In five workshops of two days each, the SETs demonstrated the activities to regular teachers of the respective schools where children with SLD were studying. The emphasis was on integrating the supportive intervention activities in the school activities (eg. general assembly, free time & recess, group activities etc.) and subject teaching learning activities in the classroom (eg. language, social studies, art & craft, music & dance, science & maths, yoga & physical education etc). Intermittent visits of SETs and therapists were made to observe the classrooms and children with SLDs and further supervision of classroom integrated activities. Informal feedback from the students, teachers and parents were also obtained in view of assessing the intervention approach.

Result and Discussions

Every individual child is unique, and their circumstances and needs should be taken into account when designing an intervention plan. Personalization of supportive interventions was ensured during assessment and interventions by each of the professional experts. The intervention plan in each of the therapeutic areas was designed considering children's individual differences, cultural background, their age and developmental aspects and comorbid conditions as the coping mechanism, responses to intervention, individual's beliefs, attitudes, and values towards intervention, age appropriateness and multiple co-occurring conditions play an important role on effectiveness of the intervention programmes. Prior to initiating the designed intervention plan, children and their family members were made aware of the treatment process, potential risks, benefits, and alternatives and complete confidentiality was maintained throughout the intervention process. Later the basic activities carried out during the individualized intervention have been selected in view of integrating during classroom activities in the school through teachers mediated approach.

Integrating perceptual-motor activities in day-to-day activities of the school and classrooms

All the 32 children were assessed thoroughly by the occupational therapist and the nature of perceptual motor dysfunctions commonly observed in children with SLD is shown in table-1.

Table-1 shows Nature of perceptual-motor dysfunction in Children with SLD

S. No	Nature of perceptual-motor dysfunction	Descriptions	Count (%) (N=32)
1	Touch/tactile perception	Dysfunction relating to discriminating and matching temperature and texture.	3 9.37
2	Auditory perception	Dysfunction relating to discriminating and matching tone and sound, auditory-motor incordination, dysfunction relating to locating sound source, dysfunction relating to sequencing and continuity of sound.	11 34.37
3	Visual perception	Visuo-motor incordination, dysfunction relating to discriminating figure and ground, dysfunction relating to matching form constancy, dysfunction in determining position in space, dysfunction in determining spatial relationship.	28 87.5
4	Vestibular perception	Dysfunction in perceiving body's position in space and spatial relationship between body and other objects in space	32 100
5	Kinaesthetic perception	Dysfunction in coordinating body movements (actions, postures, locomotions).	29 90.63
6	Touch perception and proprioceptive perception (stereognosis)	Dysfunction relating to discriminating and matching objects by feeling it with the hand (astereognosis).	3 9.37
7	Auditory and visual perception	Dysfunction relating to discriminating and matching phonemic and graphic information.	19 59.37
8	Visual and kinaesthetic perception (praxis)	Dysfunction relating to parts of a structure and inter-relation of the position of the parts (apraxia)	19 59.37
9	Vestibular, tactile, proprioceptive and kinaesthetic perception	Dysfunction relating to perceiving speed of one's body's movements in space.	12 37.5
10	Vestibular, visual and auditory perception.	Dysfunction relating to perceiving speed of an object moving in a space	27 84.37

11	Touch and tactile, proprioceptive kinaesthetic, vestibular and visual perception.	Dysfunction relating to body awareness, body-part awareness, body image, laterality, directionality, cerebral dominance, mid-line crossing.	9 28.12

It is well established that sensory input is thought to have a mediating effect on arousal and alertness states, that helps the brain to develop and function (Saunders, 2005), children with SLD also showed more than a single type of perceptual-motor dysfunctions. Most of them had dysfunction in the area of kinaesthetic, vestibular, visual, auditory and combination of more than one type of perceptual processing skills. The identified dysfunctions in children with SLD were difficulty in performing skills not previously mastered, where motor planning was required. Sensory processing deficits were observed along with generally poor coordination, accident proneness, and disorganized movement. Harron (2014) also acknowledged the role of occupational therapists in schools for supporting the needs of children with sensory processing issues, attention issues and to improve focus and social skills. The children exhibited excessive concentration when approaching a new skill. Reducing sensory overload is a first step towards helping children feel safe and calm in the classroom environment (Kranowitz, 1998). Inefficiency and awkwardness of movements were noted. Emotionally instability, irritability, getting frustration was commonly observed. They seemed to appear as unwillingness to change themselves as well as unwilling to cope with the change in their immediate environment. . Kranowitz (1998) also suggested that children with sensory difficulties might have trouble getting organized, and need support to overcome a feeling of chaos externally and internally. She suggested that these children are most comfortable when things are "exactly as they were yesterday and will be tomorrow. Generally normal onsets of developmental motor milestones were reported by the parents and family members, but there were found delay in acquisition of skills such as dressing, grooming and manipulation of toys appropriately (blocks, puzzles, etc.). Deficient skills were also noted.

Individualized occupational therapy programme was designed by the occupational therapist based on the assessment on perceptual-motor dysfunction. Mainly four areas like sensory stimulation (Saunders, 2005, Aldrich & Shelly, 2006), motor planning (Newman & Kranowitz, 2012). sensory integration (Miller, 2007; Luborsky, 2017), and perceptual motor training were identified and selected for intervention. The similar findings were reported earlier that children with SLD and Sensory Processing Disorders could benefit from the regulatory effects of movement and exercise, as well as from opportunities to engage in multi-sensory activities (Luborsky, 2017). An activity log having discriminatory activities on visual, auditory and tactile senses was developed followed by tracking of objects in the environment to stimulate the visual, auditory and kinaesthetic senses (American Occupational Therapy Association, 2015). Movement related activities (Miller, 2007; Barnett & O'Shaughnessy, 2015 & Luborsky, 2017) in progression like slow, gradual increasing order from calm to rhythmic input were

exercised, for example, children were made to rock over ball, or ride pendulum swing while his feet touch the floor, proprioceptive input through resisted activities, joint compression, and traction working against firm object or gravity, manual pressure touch were given.

Kranowitz (1998) suggested that children learn best when they investigate subjects that are interesting and relevant. Therefore, motor planning activities were designed for a new or unfamiliar aspect of a learned skill in a specific manner. For example, the children were given opportunity to learn to skip a rope and with practice, they became quite efficient at it, then gradually some changes were introduced, such as skipping rope backward that requires the programming of some different actions and demands attention and concentration in order to learn the task.

Sensory Integration therapeutic approach was executed knowing the children's preferences when creating activities for them and aimed to focus on developing the sense of achievement in children (Schaaf & Miller, 2005). Sensory integration training was given through linear vestibular input like prone forward motion in hammock or inflated ball, proprioceptive input applied through resistance, compression and traction like quadruped position on firm surface pushing forward against moderately firm surface, positioning in seat or prone position in hammock, seated movement on carpeted barrel etc., vestibular processing by activities like swinging the child on platform in prone, supine, seated and puppy position, tilting on a firm surface in quadruped, kneeling and in standing position, making the child to slide down on a metal disc on inclined plane facing forward, backward and sideways in sitting, puppy and standing position, walking on a straight line balancing book on head, walking on balance beam etc.

Perceptual-motor training was given through activities for matching similar stimuli, sorting and separating dissimilar stimuli, classifying stimulus information, body awareness, body image, laterality, drills regarding form constancy and figure-ground discrimination, coordination by feedback exercises, space orientation activities (trampoline, hammock, jungle gyms), midline crossing, praxis, stereo-gnosis, motor planning.

These activities were demonstrated to the SETs at the centre by the therapists and further carried out by the SETs with allotted students under the supervision of the therapist. Barnett and O'Shaughnessy (2015) claimed that it was essential for OTs and teachers to collaborate in order to ensure maximum benefit for the shared student. A schedule of basic activities based on occupational therapy interventions were prepared jointly by the therapist, SETs and school teachers to integrate these activities in school during physical education, general assembly, free time, recess and in other activities that support the child's ability to benefit from classroom activities and enhance their engagement (Barnett & O'Shaughnessy, 2015). Miller (2007) also reported that this approach to curriculum guided by the idea of sensory integration therapy was motivating to children in selecting activities those were beneficial to them.

Integrating activities enhancing communication of Children with SLD

The dysfunction observed in the area of speech and language is shown in table-2.

S.No.	Speech and language dysfunction	Modalities affected	Count (N=32)	(%)
1	Phonological dysfunction	Comprehension	16	50.00
2	Syntactic dysfunction	Expression	23	71.87
3	Semantic dysfunction	Verbal	29	90.63
4	Pragmatic dysfunction	Gestural	19	59.37
5	Linguistic/Non-linguistic	Reading-Writing	29	90.63
6	Mixed type	Spelling	21	65.63

As reflected in table-2, most of the children with SLD had shown dysfunction in speech and language area particularly in semantic, linguistic, non-linguistic, syntactic and of mixed-type. Polmanteer & Turbiville (2000) had also reported ranges of speech and language disorders in developing children and children with weak language skills can benefit from nonlinguistic modes of expression also (Levine, 2001). Children were given familiar situation like 'how had you reached to this centre?', 'how will you plan your outing on weekends?', and were asked to explain in few sentences. They had the options to express it orally or in written form and both. Their expressions were recorded and contents analysis were done to identify the areas of dysfunction such as phonological dysfunction was noted in case of misarticulated speech sound production, syntactic dysfunction were observed through grammatical errors done by the children. The verbal and written performances showed the dysfunction in semantic and application (pragmatic) of language in different circumstances. Spelling errors were found in most of the cases that represented dysfunction ranging from phonological error to pragmatic and linguistic dysfunctions, similar dysfunctions were reported by Geetha & Prema (2007) in a study.

Language and communication training were imparted by the therapists through individualized approach during initial intervention sessions followed by joint efforts of SETs and parents who were in contact with the child's daily life. Similar strategies were reported by Wong-Fillmore and Snow (2000) describing the roles of teachers as communicators. The selected training targets had a focus on the immediate usability of words and sentences. The children were initially asked to choose from- two or more alternatives as a response to a series of commands. The response was typically pointing to the corrective alternative. Gradually, abstract or imaginative vocabulary, indirect questions and ambiguous statements etc. were introduced to these children for improving their level of comprehension. Children were also trained to follow instructions in increasing order of difficulty. Multi-step instructions and commands were given in systematic manners to be followed by these children. Modeling and imitation strategies were used during the initial intervention for enhancing expression skills. After 10-12 sessions and with continuous practice, children started learning to imitate responses. The most frequently used procedure for intervention in expressive skills was

to show the student an object, picture or event and they were asked to describe the object, picture or events. The children were encouraged through creating situations for asking questions and various information, describing events or actions or needs, requesting for clarification, participating in a conversation etc. and so on.

Articulation training was provided to those students who were showing phonological dysfunction. The aim was to improve the overall clarity of speech by correcting defective sound production. Articulation training was carried out at four different levels, i.e sound level, syllable level, word level, and sentence level based on the children's performances. Success at each level determined intervention steps moving on to the next levels. Recognize own errors, Correcting the errors by producing a new sound, strengthening the use of sounds at each level and Transferring the sound in spontaneous speech under all conditions for everyday usage were intervention mechanism followed mainly in the clinical setups.

School based interventions in the area of speech and language were mainly on use of language in day to day situations (Pickstone et al., 2009). The American Speech-Language-Hearing Association (2000) acknowledges the value of play for increasing function for children with speech and language delays or disorders that language should be taught in a natural setting. Bunning (2004) suggested that the communication environment may include individuals, people present in environment, their style of communication, settings and activities going on. Regular teachers were explained the purpose of language intervention and the activities were demonstrated by the therapist and SETs. They were encouraged to create language learning situations in the classroom along with other children. Stories specially constructed around familiar themes were created to provide language learning experience and children were given opportunity to practice the grammatical rules and emphasize the semantic context. They were allowed to participate in classroom conversations and simultaneously voice related training was given to improve the pitch, loudness and quality of the voice for clarity. Levine (2001) encourages the use of music and rhythmic activities for children with weak language processing in order to reinforce language sound appreciation. In the classroom, teachers were asked to use songs and simple games during transitions to engage the children's attention. In addition, engaging the child's attention is crucial, as one study showed that children whose mothers encourage joint attention to objects, and supply labels for them increase their vocabularies faster (Campbell & Namy, 2003).Games allow children to learn patterns and sequences, which are essential concepts to master in language development (Learning Disabilities Association of America, 1999).

Integrating activities enhancing positive behaviour in children with SLD

Long et al. (2007) suggested the application of the proactive prevention program developed by Sugai and Horner (1999, as cited in Long et al., 2007) referred to as the Positive Behavior Intervention and Support (PBIS). PBIS as a multi-tier prevention program aims to improve the quality of life of all children in the classroom while minimizing disruptive patterns of behaviour of children who exhibit them.

In this study, all the children with SLD were assessed by the psychologists using a self-designed, clinic-based, bilingual 90-items behavioural checklist with rating options of 'Never-0', 'Low-1' and 'High-2' occurring behaviour followed by parental report of challenging behaviours in children. Altogether 9 children with SLD were showing challenging behviours in the classroom like frequent shifting from one task to another without completing the task, insisting to be alone, didn't show interest in on-going activities in the classroom, shyness in participating in group activities dismantling objects, threatening gestures, spitting, telling lies and stealing objects of others, distractions from activities, appearing to be sad and withdrawn behaviours.

After identifying the challenging behaviour in children, the psychologist conducted detailed assessment to collect information about the reasons or functions of the particular behaviour, its antecedent factors and the consequences of these behaviours. This was carried out through interview of individual child, his/her parents and teachers and also through observations. rating scales. After recording the baseline measures and analysing the antecedents and consequences of behaviour, the behaviour management plan was developed based on the functions of the targeted behaviour. All techniques involve either changing antecedents and/or consequences of the behaviour. Behaviour management plan was then implemented and periodic assessment was done using behavioural recording techniques. Techniques like task analysis, prompting, chaining, shaping, reinforcement, modelling, token economy, contingency contracting etc. were used to increase the positive behaviours(Scott, Alter, & Hirn, 2011; Simpson, Peterson, & Smith, 2011) and restructuring the environment (Sutherland et al. ,2008), extinction, response cost, over correction (Sutherland et al., 2008), differential reinforcement for appropriate alternate behaviour (DRA), absence of undesirable target behaviour for a specified period of time and occurrence of other behaviour(DRO), occurrence of behaviours which are incompatible with the targeted problem behaviour (DRI), and occurrence of low rates of the undesirable target behaviour (DRL) along with self-management strategies (Karner Blue Education Center, 2014) were applied to decrease the challenging behaviours. Significant improvement was reported in behaviour of all the children after the clinical sessions of three times in a week for four months. The team of psychologist, SET and other therapists visited each schools and discussed the issues with principals and teachers in a workshop mode. The school functionaries, especially teachers were made aware of the PBIS programme for all children to be implemented in the school.

Participants in this programme then include all children, school personnel, principal, teachers and parents. The program was designed to be delivered in three tiers. The first level of support was primary level and was delivered to all students. The aim was to prevent occurrence of the challenging behaviour and this focused on the universal application of safety and health maintenance to reduce the need of secondary and tertiary prevention programme (Kauffman, 1999). Scott et al. (2011) argued that unstructured periods of time were associated with students' disruptive behavior. Students' disruptive behaviors are less likely to occur when teachers are engaged in classroom instruction. The primary support was provided to address the needs of the

majority of the needs of students of the school. It was expected that only few students would require intensive levels of support (Long et al., 2007). The second tier was developed to support children with SLD who required intensive services that could be delivered in groups. According to Kauffman (1999), the secondary level of support is designed to keep the disorder from increasing in severity. The goal of the second level of prevention is to restrict the growth of the disorder and reverse it or correct it, if possible. Secondary prevention addressed the needs of the students who did not respond well to primary support. Still there were very few children who were neither responding to the primary nor the secondary level of support. Therefore, students in the third level were provided services that were individualized and tailored to address their individual needs. The tertiary level of prevention was designed to address challenging behaviours. In this level, children with SLD required services provided by the psychologist with the assumption that children are more likely to learn and succeed if their social-emotional needs are addressed. Therefore, PBIS was strategically developed to meet the needs of all children of the targeted school.

Counselling Services

Tarver-Behring, et al (1998) described counsellor responsibilities in case of dealing with children with disabilities as providing counselling for curriculum lessons, individual and/or group counselling, short-term, goal-focused counselling, encouraging family involvement in educational process, consulting and collaborating with school functionaries and families to understand the special education needs of children, making them understand the adaptations and modifications needed to assist the child, advocating for children with SLD in the school and in the community, collaborating with other related professionals (e.g., therapists, special education teachers etc.) in the delivery of support services and providing assistance with developing IEP for academic, transition and postsecondary plans for children. In the present study the participant children with SLD had experienced problems such as non-acceptance, discrimination, stereotypically thinking, frustration and difficulty in attempting to resolve the issues that are encountered with daily living activities and chronic hopelessness as a result of anxiety and depression along with their persistent challenges in performance in schools. They were exhibiting delayed development of self-concept. The counsellor conducted assessment to identify the counselling needs of these children using TNAS and also through direct interview and interaction with parents. The identified needs are shown in table-3.

Table-3 showing the identified counselling needs of parents and children with SLD

S.No.	Identified Counselling Needs	Count (N=32)	%
1	Understanding child condition & diagnosis	32	100
2	Understanding assessment report and Strength and needs of the child	32	100
3	Underlying causes	29	90.62

4	Prognostic aspects	32	100
5	Needs related to genetic counseling	02	6.25
6	Needs related to obtain disability certificate	26	81.25
7	Crisis intervention	32	100
8	Adjustment needs	32	100
9	Counseling needs related to misconceptions	13	40.63
10	Support services available-human, aids, appliances, incentive schemes etc.	32	100
11	Needs for imparting information related to education, rehabilitation services, reservation	32	100
12	Group counseling needs of parents	9 28.13	
13	Multiple needs	32	100

As reflected in the table-3, all the children with SLD and their parents required counselling in more than one aspects of counselling. The needs of counselling for understanding child condition & diagnosis, understanding assessment report and strength and needs of the child, about their future, crisis intervention, accepting their children as children with SLD, support services available, needs related to information in the area of their children's education, rehabilitation services, reservations etc,, group counseling were found common among the parents whereas most of them also required counseling related to causes and information related to obtain disability certificate. A few of them were counseled against the prevailing misconceptions and also referred for genetic counseling. Similar counseling skills needed to work with these children and their families such as communication strategies with humanistic approach and experience with an array of therapeutic techniques were reported earlier studies (Cochrane & Marini, 1977, Baker, 1992, Tarver-Behring, et al, 1998). Moreover, a proactive approach to the role of counsellor, a focus on relationship-building, a desire to operationalize equal opportunities policies, an inclusive approach to initial assessment, flexible and creative approaches to counselling, continuing professional training and awareness raising can be important facts in all counselling processes.

Some of the children exhibited inappropriate behaviour relative to their chronological age and often were socially isolated. A poor self-concept was another quality found in this study in almost all children. They were found lacking adequate expressive language, and were often disorganized in their thought processes, and had considerable difficulty with time and activity management skills. In addition to academic deficiencies and related functional social, emotional, and behavioral difficulties were also found in many studies (Grigorenko, et al 2020, John, et al 2020, Famolu, 2020 & Scaria, et al, 2023)

Group-counselling sessions were organized frequently by the counsellor to develop social and organizational skills which were found effective. Similar findings were reported by Amerikaner & Summerlin (1982) with social skills and relaxation training to develop self-concept and in-class behaviour of children with SLD.

It was also reported that counsellor Correct information and direct experience can facilitate accurate awareness and acceptance of these groups. In addition, counselors must obtain knowledge and training for working with specific groups with exceptional needs (Tarver-Behring,Spagna, and Sullivan, 1998; Tucker,Shepard,and Hurst, 1986). They can obtain this knowledge through, counseling workshops, consultation, supervision, current therapeutic literature, and community resources.

Conclusion

Learning activities contribute to the vitality and richness of the life. It provides tools to create a life of involvement and self-directed participation, and it fosters attitude and appreciations which enhance the quality of learning experiences. Occupational therapy is a method of intervention to restore, reinforce and enhance the performance required in day-to-day life and concerned with the social, psychological and cognitive development of the individual. It facilitates learning skills and functions essential for correction of dysfunctions, promotion and maintenance of good health. Speech and language are defective when they are difficult to understand or unpleasant and may have errors in comprehension, expression, articulation, voice and fluency. Speech and language therapy is a remedial intervention programme to improve the existing communicative behaviour and facilitate learning of new communication behaviours by rearranging and manipulating the factors facilitating the language and communication acquisition. Behaviour management programmes helps in decreasing problem behaviours and increasing appropriate pro-social behaviours. Appropriate behavioural techniques include techniques like restructuring of environment, extinction, differential reinforcement, time out, response cost, etc to decrease problem behaviours and other techniques like task analysis, prompting, chaining, shaping, reinforcement, modelling, contingency contracting etc. to increase skill behaviours.

References:

Aldrich, J. E., & Shelly, T. (2006). See me! hear me! touch me! move me!. Intervention In School & Clinic, 42(1), 54-55.

American Speech-Language-Hearing Association. (2000). Early identification of speechlanguage delays and disorder. Retrieved October 2018, from http://www.ldonline.org/article/Early_Identification_of_SpeechLanguage_Delays_and_Disorders?theme=print.

Amerikaner, M., & Summerlin, M. L. (1982). Group Counseling with Learning Disabled Children: Effects of Social Skills and Relaxation Training on Self-Concept and Classroom Behavior. *Journal of Learning Disabilities*, *15*(6), 340-343. https://doi.org/10.1177/002221948201500607

Barnett, J. E., & O'Shaughnessy, K. (2015). Enhancing collaboration between occupational therapists and early childhood educators working with children on the autism spectrum. Early Childhood Education Journal, 43(6), 467-472.

Batshaw, M.L. and Perret, Y.M. (1986). Learning disabilities. Children with handicaps-a medical primer, Paul H. Brookes Pub. Co., Maryland:Baltimore.

Bunning, K. (2004) Speech and language therapy intervention frameworks and processes. London: Whurr Publishers Ltd.

Campbell, A. L., & Namy, L. L. (2003). The role of social referential context and verbal and nonverbal symbol learning. Child Development, 74, 549-563.

Chrystal, C., & Luciano, L. (2007). No child left behind and the changing role of the special educator: Is the glass half empty of half full? In N. Long, W. Morse, F. Fecser, & R. Newman (Eds.), Conflict in the classroom: Positive staff support for troubled students (6th ed., pp. 186-192). Austin, TX: Pro-Ed.

DSE(MR) notes on Occupational therapy. NIMH: Secunderabad.

Famolu, F. (2020). Identification and Teaching of Students with Specific Learning Disability: Counselling Implications. 10.13140/RG.2.2.15725.92645.

Geetha, Y.V. and Prema, K.S.(2007). Classification of Developmental Language Disorders (DLD) - an exploratory study. Journal of All India Institute of Speech and Hearing, vol.26, pp.41-46.

Grigorenko EL, Compton DL, Fuchs LS, Wagner RK, Willcutt EG, Fletcher JM. Understanding, educating, and supporting children with specific learning disabilities: 50 years of science and practice. Am Psychol. 2020 Jan;75(1):37-51. doi: 10.1037/amp0000452. Epub 2019 May 13. PMID: 31081650; PMCID: PMC6851403.

Harron, W. (2014). Occupational therapy. The Nemours Foundation/KidsHealth. Retrieved November 2017, from http://kidshealth.org/en/parents/occupationaltherapy.html?ref=search&WT.ac=msh-p-dtop-en-search-clk

John, A., Sukumaran, A. S. B. & David, N. (2020). Practice Guidelines for the Assessment and Intervention of Specific Learning Disabilities (Revised, 2020). Indian Association of Clinical Psychologists. Available at https://iacp.in/wp-content/uploads/2022/01/practice-guidelines-SLD-2020-revised-compressed.pdf

Karner Blue Education Center / Overview. (2014). Retrieved November 1, 2014, from http://www.nemetro.k12.mn.us/domain/333

Kauffman, J. (1999). How we prevent the prevention of emotional and behavioral disorders. Exceptional Children, 65(4), 448-468.

Learning Disabilities Association of America (1999). Speech and language development milestones chart for parents and teachers. Retrieved April 2017, from http://www.ldonline.org/article/6313.

Levine, M. (2001). Educational care. (2nd ed.) Cambridge, MA: Educators Publishing Service.

Long, N., Morse, W., Fecser, F., & Newman, R. (2007). Conflict in the classroom: Positive staff support for troubled students (6th ed.). Austin, TX: Pro-Ed.

Luborsky, B. (2017). Helping children with attentional challenges in a montessori classroom: The role of the occupational therapist. NAMTA Journal, 42(2), 287-352.

Maajeeny, H. (2019). The Therapeutic Classroom for Children with Emotional and Behavioural Disorders. European Journal of Special Education Research. 4(4), 170-177. doi:10.5281/zenodo.3406700.

Miller, D. (2007). A "rich diet" for learning: A multi-sensory approach that nourishes all children. Exchange, pp. 48-54.

NIMH(1989). Mental retardation-a manual for psychologists. NIMH: Secunderabad.

Penso, D.E. (1988). Occupational therapy for children with disabilities. London: Croom Helm.

Pickstone, C., Goldbart, J., Marshall, J., Rees, A., & Roulstone, S. (2009). A systematic review of environmental interventions to improve child language outcomes for children with or at risk of primary language impairment. Journal Of Research In Special Educational Needs, 9(2), 66-79.

Polmanteer, K. N., & Turbiville, V. P. (2000). Family-responsive individualized family service plans for speech-language pathologists. Language, Speech & Hearing Services In Schools, 31(1), 4-14.

Saunders, D. (2005). The importance of sensory processing. Retrieved March 2024, from https://www.fundacionsindano.com/wp-content/uploads/2017/11/LECTURA-The-Importance-of-Sensory-Processing.pdf.

Scaria LM, Bhaskaran D, George B. (2023). Prevalence of Specific Learning Disorders (SLD) Among Children in India: A Systematic Review and Meta-Analysis. *Indian Journal of Psychological Medicine,* 45(3):213-219. doi:10.1177/02537176221100128

Schaaf, R. C., & Miller, L. J. (2005). Occupational therapy using a sensory integrative approach for children with developmental disabilities. Mental Retardation & Developmental Disabilities Research Reviews, 11(2), 143-148.

Scott, T., Alter, P., & Hirn, R. (2011). An examination of typical classroom context and instruction for students with and without behavioral disorders. Education and Treatment of Children, 34(4), 619-641.

Simpson, R., Peterson, R., & Smith, C. (2011). Critical educational program components for students with emotional and behavioral disorders: Science, policy, and practice. Remedial and Special Education, 32(3), 230-242.

Subba Rao, T.A. (1992). Manual on developing communication skills in mentally retarded persons, NIMH: Secunderabad.

Sutherland, K., Lewis-Palmer, T., Stichter, J., & Morgan, P. (2008). Examining the influence of teacher behavior and classroom context on the behavioral and academic outcomes for students with emotional or behavioral disorders. The Journal of Special Education, 41(4), 223-233.

Wong Fillmore, L. & Snow, C. E. (2000). What teachers need to know about language (Contract No. ED-99-CO-0008). U.S. Department of Education's Office of Educational Research and Improvement, Center for Applied Linguistics.

Universal Design for Learning: An Inclusive Pedagogy

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Abstract

Universal design for Learning (UDL), the concept that originated from the concept of Universal Design, is the most common and effective pedagogy today used in an inclusive classroom setting, internationally. This paper attempts to present the need for UDL in the Indian context. NEP 2020 emphasizes on inclusive and equitable education forall. UDL aims to make education accessible for the diverse learners inaclass.This paper tries to explain the frame works used in UDL. It also attempts to give some practical suggestions for how the principles of multiple means of representation, engagement, action & expression can be a malgamated in the lesson plans based on UDL principles to make teaching learning process accessible and meaningful for all learners in a class.

Introduction

The majority of schools' curricula are created for a uniform student body and cannot accommodate varying learning styles. Students are forced to adjust to rigid curricula as a result. It is expected of teachers to develop resources that are tailored to the needs of children with neurodiverse personalities. In the general education curriculum, teachers should ideally offer inclusive and productive learning opportunities for every student. This guarantees that all children, including those with disabilities, feel included and that no child is singled out. The ideas of Universal Design and Universal Design for Learning are covered in this monograph.

Intersection of NEP 2020 and SDG 4

As per National Education Policy 2020 the focus must be on education that is fundamental to achieving full human potential, developing an equitable and just society, and promoting national development[4].

The global education development agenda reflected in the Sustainable Development Goal 4, also seeks to ensure inclusive and equitable quality education, and promote lifelong learning opportunities for all by 2030. The education system must, therefore, aim to benefit all of India's children so that no child loses any opportunity to learn and excel because of the circumstancesof birth or background[5].

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Since NEP 2020 and SDG 4 both focus on addressing diversities and providing education to all, various inclusive pedagogies need to be explored to make education accessible, engaging,and meaningful for all.

Universal Design

Universal design, as advocated by Mace in 1973, aims to foster the creation of products and environments that cater to all individuals, including those with disabilities[3]. It involves designing buildings, products, or spaces in a way that ensures accessibility for people of all ages and abilities, stemming from a commitment to rights and non-discrimination. Building upon earlier concepts like barrier-free design and advancements in accessibility technology, universal design integrates aesthetics with functionality to accommodate diverse needs (Zilberberg, 2020)[6]. With rising life expectancy and advancements in medical care enabling more people to live with disabilities, there is an increasing recognition of the importance of universal design. While courses, technology, and student services are typically designed for the narrow range of characteristics of the average student, the practice of universal design in education (UDE) considers people with a broad range of characteristics in the design of all educational products and environments (Burgstahler, 2007)[1].

Universal Design for Learning

In 1984 the Center for Applied Special Technology, CAST applied the concept of universal design to a framework for curriculum reform in education[2]. The UDL Guidelines are a tool that can be used to design learning experiences that meet the needs of all learners. The UDL Guidelines and associated checkpoints align to this neurological organization and help educators address the predictable variability in learning that we know will be present in any environment. UDL recognizes variability in: *Engagement* (the 'why' of learning, which alignswith affective networks): interest, effort and persistence, and self-regulation *Representation* (the 'what' of learning, which aligns with recognition networks): perception, language and symbols, and comprehension *Action & Expression* (the 'how' of learning, which aligns with strategic networks): physical action, expression and communication, and executive function (CAST 2018)[2].

Universal Design for Learning (UDL) is a rigorously validated framework that serves as a guide for educational methods. It enables the creation and execution of a versatile and adaptable curriculum. UDL presents choices regarding how information is conveyed, how studentsinteract or showcase their understanding, and how students are involved in the learning process.By implementing UDL, all students are empowered to access, engage in, and advance throughthe general education curriculum, as it diminishes obstacles to instruction.

Vertical Framework of UDL

UDL is a framework that directs the development of educational settings to cater to the diverse needs of all students. Grounded in accessibility, flexibility, and inclusivity, UDL strives to eliminate obstacles to learning and ensure every student has equal

opportunities for success. Central to UDL is the acknowledgment that learners possess unique strengths, challenges, interests, and preferences. It underscores the significance of offering various means of representation, engagement, and expression to accommodate these differences. Through providing multiple avenues for learning, UDL empowers students to access and demonstrate their understanding in manners that resonate most effectively and meaningfully with them.

Multiple means of representation, multiple means of expression, and multiple means of engagement are key concepts within the vertical framework of UDL (CAST)[2].

- Multiple forms of representation: This principle recognizes that students perceive and understand information in a variety of ways. Teachers should address this by offering content and information in a variety of formats, including text, pictures, audio recordings, videos, and hands-on activities. Students with different learning preferences, styles, and skill levels can access and comprehend the material more efficiently when it is presented in a variety of ways.
- Multiple means of expression: This principle recognizes that learners have different ways of expressing their understanding and demonstrating what they have learned. Educators should offer students various options for how they can express their knowledge and skills, such as through writing, speaking, creating visual representations, or using technology. By providing multiple avenues for expression, students can showcase their abilities in ways that align with their strengths and preferences.
- Multiple means of engagement: This principle emphasizes the importance of providing diverse opportunities to engage students in learning. Educators should offer activities and experiences that appeal to different interests, preferences, and levels of motivation. This can include incorporating interactive learning tasks, collaborative projects, real world applications, and choice-based activities. By offering multiple pathways to engagement, educators can increase student motivation, participation, and overall learning outcomes.

Horizontal Framework of UDL

Horizontal framework refers to three rows. The first row focuses on learners having access by providing options for recruiting interest, perception, and physical action. The second row stands for building knowledge by providing options for sustaining effort and persistence, language and symbols, and options for expression and communication. The third row standsfor internalization of learning by providing options for self-regulation, options for comprehension and options for executive functions.

- The *access* row includes the guidelines that suggest ways to increase access to the learning goal by recruiting interest and by offering options for perception and physical action.
- The *build* row includes the guidelines that suggest ways to develop effort and persistence, language and symbols, and expression and communication.

- The *internalize* row includes the guidelines that suggest ways to empower learners through self-regulation, comprehension, and executive function.

The goal is to create expert learners who are motivated, resourceful, and goal directed. The horizontal framework of UDL also refers to its application across different subject areas or disciplines within education. Rather than being limited to specific subjects or topics, UDL is designed to be implemented horizontally across the curriculum (CAST)[2]. This means that the principles and strategies of UDL are applied consistently and universally across all subject areas, regardless of content or grade level.

UDL Based Lesson Plans

Teachers in an inclusive classroom should write lesson plans based on UDL principles. Lesson plans that are accessible and effective for all students by addressing the variability in learners' needs, strengths, and preferences. UDL lesson plans should integrate multiple means of engagement, representation, action, and expression.

Steps to Write UDL-Based Lesson Plans

1. **Identify Learning Goals**
    - Define clear, flexible goals that provide appropriate challenges for all students.
    - Focus on what students need to learn and be able to do, not on how they will achieve it.
2. **Analyze Learner Variability**
    - Consider the diverse needs, strengths, and preferences of all students.
    - Think about potential barriers to learning that might exist for different students.
3. **Provide Multiple Means of Engagement**
    - Stimulate interest and motivation for learning. (e.g., offer choices in how students engage with the material, working in groups or individually).
    - Provide varying levels of challenge to keep all students engaged (e.g., set clear goals and objectives for sustainable effort by all students, encourage collaboration and communication among students, offer regular feedback and support).
    - Teach strategies for self-assessment and reflection (e.g., encourage goal setting and monitoring progress by students themselves).
4. **Provide Multiple Means of Representation**
    - Present Information and content in different ways (e.g., use text, video, audio, graphics).
    - Highlight important information in multiple ways (e.g., color-coding, underlining).
    - Support understanding across languages (e.g., provide translations and support

for non-native speakers).

- Use symbols and visuals to aid comprehension.
- Clarify vocabulary and symbols (e.g., pre-teach key terms and concepts). 5. Provide Multiple Means of Action and Expression
- Differentiate the ways students express their learning (e.g., allow responses in written, oral, digital, or physical form).
- Support planning and strategy development (e.g., teach students how to set goals, plan, and organize their work).
- Enhance capacity for monitoring progress (e.g., encourage self-assessment and peer assessment by providing them checklists and rubrics).

5. Design Assessments with Flexibility

- Use formative assessments to monitor student progress and inform instruction. • Design summative assessments that allow students to demonstrate their knowledge in various ways.
- Ensure assessments are accessible to all students, including those with disabilities.

Conclusion

By reducing instructional barriers, UDL enables all students to access, interact with, and progress in the general education curriculum. Developing expert learners—students who are able to assess their own learning requirements, monitor their progress, and sustain their motivation, effort, and perseverance during learning activities is the aim of Universal Design for Learning. Teachers can identify each student's unique skills, needs, and interests across the three learning networks (engagement, action and expression, and recognition) and incorporate this information into a thorough lesson plan by using a UDL framework.

References

Burgstahler S. (2007) Universal Design in Education: Principles and Application, retrieved from https://files.eric.ed.gov/fulltext/ED506545.pdf CAST (2018). UDL and the Learning Brain, retrieved from URL https://med.stanford.edu/content/dam/sm/gme/program_portal/faculty/Program_Direc tor_Retreat/Handouts%20Combined.pdf

Mace R. (1973). In “Ronal Mace and his Impact on Universal Design”, by Stephanie Woodword, retrieved from URL https://cdrnys.org/blog/advocacy/ronald-mace-and his-impact-on-universal-design/

National Education Policy (NEP) 2020, retrieved from URL https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.p df 5. Sustainable Development Goals, retrieved from URL https://sdgs.un.org/sites/default/files/202009/SDG%20Resource%20Document_Tar ge ts%20Overview.pdf

Zilberberg, H. (2020). “How to deal with competing access needs" *Independence Australia*. 2020-08-03, retrieved from URL https://www.independenceaustralia.com.au/tips-and-advice/competing-access-needs tips/

Teacher Preparedness: Looking within to Reach Out

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Abstract

Specific Learning Disability is a neuro developmental disorder. This is a hidden disability that may not be noticed easily. Child struggles with academic skills—reading, writing, grammar, spellings and mathematics. Keen observation is necessary for Early Identification. A Check List comes handy. One needs to first rule out any chronic illness, physical, mental, emotional and social concerns that may be responsible for the child's poor performance. Early Interventions can then be worked out as per individual child's need/needs. However, clinical diagnosis is a must to verify the type of SLD s/he has and recommendations for the same. Teacher Preparedness for an Inclusive Class room is essential. S/he is in the center of the class room dynamics. Physical, Mental, Emotional and Spiritual well- being of the teacher is as important as the acquisition of professional knowledge. The onus of all the children's well-being in an inclusive class lies arduously on the teacher. S/he armed with the correct attitude, knowledge, appropriate mental makeup of love, empathy, inner spiritual energy can take a needy child from zero to zenith. Class management and planning along with a team consisting of parents, peer group, special educator/counsellor is the key to success.

Keywords: *Specific Learning Disabilities, Hidden Disabilities, Keen Observation, Early Identification, Check List, Early Intervention, Teacher Preparedness—Physical, Mental, Emotional, Spiritual Well- Being, Team Work-Parents& Peers, Class Management & Planning*

Introduction:

The need to address the topic of 'teacher preparedness,' cropped up when as an educator I came across the most respected colleagues feeling helpless, unsure, hesitant, and overburdened while dealing with children with certain conditions. At their behest I have ventured to share my experiences while teaching children with certain learning disabilities, in the Primary classes while teaching in public schools in Delhi and NCR.

My journey of discovery began in the early 80's when not much was known about learning disabilities (LD). With a deep desire to understand this condition where a child

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appeared more intelligent than what his/her academic performances showed; I set out to meet professionals in the field who had more information on this puzzling condition and for the first time learnt about the term 'dyslexia.' With their support and guidance, I began to work with some children who needed continuous individual care in my classes with the blessings of our progressive Primary School Headmistress. My free periods were devoted to teaching these children. Fueled by a desire to understand the condition more and to gather the latest information, I attended many workshops, enrolled in multiple training programs and continued my work diligently.

My learnings led me to experiment and apply different strategies to suit specific needs of the individual children I was working with.

This commitment became a passion and then became my mission, that continues to this day. I continue to learn each day, with each child, with each experience. I am blessed to have wonderful experts who are willing to support and guide me when I feel stuck.

The best rewards I have ever received are the success stories of these students. They overwhelm me with their love and regard. This is my driving force behind sharing my insights garnered through decades of experience in helping many children with Special Learning Disabilities, especially Dyslexia.

I like to believe we all can do our very best by simply - 'Looking within to Reach out.'

The Teacher in the center of class dynamics

The onus of student wellbeing falls upon the teacher. Academic performances grade students from outstanding to average to non-performers. For average and even below-average students, we have approaches that work – like guiding & coaxing or extra inputs & practice. But it's the non-performers who are unable to make any significant improvement with all the care and extra inputs. These are the children who may have Specific Learning Disabilities (SLD).

However, we need to rule out some other conditions that may be affecting their non-performance.

1. **Disabling Physical Conditions:** Visual impairment, locomotor inabilities, muscular weakness, chronic disabling illnesses, some injuries etc. could be the reason for very poor or non-performance. Hearing impairment though not visible is also a physical disability, as are some speech related difficulties.

2. **Emotional Issues:** Children may appear disturbed, fearful, anxious, unhappy, sad, tense, lonely or cry apparently for no reason. Sometimes cases of domestic violence, broken homes, physical, mental or sexual abuse are discovered. Some children may exhibit aggression, anger, temper tantrums; use abusive language; show violent, and disruptive behaviour. These emotional upheavals in a child's life could affect the child's performance.

3. **Social Issues:** The child could face discrimination due to their social status, cultural background, language problem, typical facial features/skin tone, body shaming,

facial deformity due to accident/ genetic disorder etc. These could unwittingly hamper a child's performance in the class.

Ruling out these issues becomes essential when we are trying to identify SLD.

Early Identification

Early Identification is key to start timely, appropriate interventions. Often I've had students referred to me for remediation as late as from classes VII, VIII, IX, X without any proper Clinical Diagnosis. By then the students' needs have increased manyfolds. Having faced continuous failure, rejection and humiliation for years, these disheartened children need so much more motivation to begin afresh. It is a very sad scenario of neglect. How could this happen? **Do we cater to only some children in our classes inadvertently? Shouldn't all children matter to us? Are not we responsible for them all? We teachers must pledge not to neglect any child by initiating early identification and seeking professional help. Let no child be left behind.**

Keen observation is the key to early identification. The child is to be observed not only in the class but outside while participating in other activities in school. Just like an X-ray, a teacher's eyes must be able to catch the minutest details about a child. It's about understanding the saids and the unsaids.

Check List:

When teachers become keen observers, they can fill up the check list provided by the school**. Central Institute of Education Technology (CIET), National Council of Educational Research and Training (NCERT), New Delhi, has developed The Disability Screening Checklist- PRASHAST**- **Part 1 and Part 2**. PRASHAST is an effective preliminary screening tool. It is not a diagnostic tool. After an orientation workshop the regular teachers can fill up the first level initial screening form of PRASHAST Part 1 for all students in the class. The school Head, Special Educator and other experts decode the findings and validate it by using PRASHAST Part 2. Accordingly, teachers, parents and caretakers are guided and counselled about the suspected disability, so the intervention can get started as soon as possible. However, Clinical Diagnosis is a must to ensure the type of disability and to get the appropriate guidance from the expert.

Intervention 1

Self – Preparedness: Looking within to Reach out

Focusing on our positive mind set before entering a class helps us to be in a better frame of mind. We are surrounded by all kinds of emotions. Positive emotions like love, kindness, joy, trust, calmness make us happy and gives us positive energy. Our interactions and responses become welcoming. Whereas negative emotions like anger, sadness, worry, anxiety, fear, irritation cause unhappiness. They deplete our source of energy, making our conduct unwelcoming and creating a tense atmosphere in the class. We need to be mindful of consciously creating a welcoming environment for positive learning experiences by being in a good frame of mind.

Personal Grooming both 'outer' and 'inner' is imperative for our personal growth and conduct.

Outer Grooming: One must present a healthy, well turned- out appearance. First impressions matter.

Unknowingly preoccupied with our thoughts, often we present a serious and grim appearance and instantly the child withdraws. Have we even forgotten to smile? The best adornment that does not cost a penny is a sincere smile. **A smile is a small curve that straightens everything.** It is welcoming and infectious. It puts others at ease. The child finds the teacher approachable and does not hold back.

Inner Grooming: The core of inner grooming is-**Love, Empathy and Spirituality.**

Love: With overindulgence of negative emotions in our lives, love has taken a back seat. May factors have made this beautiful uplifting basic emotion of love dormant within us. Let us make efforts to revive and awaken this encompassing and powerful emotion within us.

Let us consciously develop a '**Culture of Love'** to create a rapport with all children and particularly those who have SLD. These children are rebuked, rebuffed, reprimanded, and laughed at so often that they cannot trust anyone easily. We need to reach out to them cautiously. A helpful starting point is to learn to accept and love ourselves with all our goodness and flaws so we can easily accept and love others with all their goodness and flaws.

Love acts like a Tonic - gives strength and hope: It creates a feeling of security, a bond of trust and friendship, leading to a rapport. It opens the door to reach the child and start working with him/her comfortably. Show love to the child with words, gestures, expressions, a pat, a firm hand clasp, a reassuring hug. Listen to what a child has to say in such a way that s/he likes to speak with you. Speak to the child in such a way that the child likes to listen to you. This way the child feels accepted and then seeks help without hesitation. When a child continues to be sad and worried due to unsuccessful attempts, she/he needs more love- simply increase the dose of the tonic of love!

Empathy: Empathy is much more than kindness, compassion, pity, altruism, and sympathy. It is a nonjudgemental communication skill to genuinely reach out to someone who is very upset, worried, sad, low, helpless and feeling worthless. In simple words being empathetic means-'putting yourself in someone's shoes'—

Seeing with the eyes of another

Listening with the ears of another

Feeling with the heart of another

Empathy is the sincere ability to recognize the feelings of others and respond to them accordingly in a positive way to uplift them. Through empathy we can establish a trusting and loving relationship with the child. Empathy is a powerful skill that enables us to reach out to a sobbing child like nothing else. It was through empathetic heart to

heart interactions that I was able to reach out to the nonperforming children in my classes and in the process sometimes discovered the horrifying bruised physical/mental agonies of children at such tender ages.

Therefore, it is necessary for us to be vigilant, especially with the non- performing children in our classes.

We can develop our capacity to empathize by consciously observing and learning to read their expressions, body language, tone of voice, non- verbal cues and general behaviour. Through our sensitivity and emotional intelligence, we can reach out to their feelings and thoughts.

And this would help us to connect with them. Once a rapport is established, work relationship between the teacher and the child becomes easier and more effective. Empathy is more therapeutic in nature. It requires a spirit of generosity, warmth, acceptance and understanding. By being empathetic the teacher creates a sense of belonging, "I am there for you, with you. You are not alone!"

Spirituality:

Teachers often find themselves surrounded by many unexpected turns of events and challenges in the class, making us feel stressed and overburdened. At such times our spiritual perspective could enable us to cope with it all.

We have reservoir of positive energy source that always exists within us. We need to dip into it and draw out this positive energy. It would provide the peace, calm and comfort we are seeking.

Meditation or silent introspection are helpful ways to practice spirituality. The practice of looking within in silence brings in tranquility, stability and clarifies our purpose. One could do so by simply being in nature quietly enjoying the flow of natural sounds around, seeing the beauty and feeling the freshness and allowing the calmness to seep in. It could be an exhilarating experience, cleansing the inner turmoil.

Spiritual Health according to Swami Sukhbodhanandji:

"Being restful, calm, inwardly silent and not noisy is indispensable to Spiritual health.

-If one is restless, mind pollutes perception.

-If mind is calm, one sees situations objectively.

-If disturbed one sees things in a distorted way."

Praying, chanting or listening to these consciously, provide spiritual oxygen.

Soft soothing music rejuvenates, its rhythmic vibrations gives immense peace.

We must feed ourselves on this nectar of spirituality to continue to refill our depleted energies. Just like electric gadgets need batteries to recharge them; we need spiritual practices to recharge our spirits!

Intervention 2

Planning

Equipped with the right attitude and mental makeup of love, empathy and inner spiritual energy one is ready for the second step of Intervention - planning.

Once a Specific Learning Disorder (SLD) is identified through screening process one must procure knowledge about the condition, discuss with a special educator and understand how to go about it. The interventions for the child must start immediately, as 80-85% brain development takes place in the first six years of life. Learning and development are most rapid in these crucial years. Later through clinical diagnosis, the type of SLD condition must be established. The recommendations and guidance of the expert should be followed while preparing the Individual Education Plan (IEP) for the child.

SLD refers to a neuro developmental disorder that affects the information processing system of the brain. The child with SLD appears to be brighter than the poor grades/he gets. There is discrepancy between his/her good intelligence and poor academic performance. SLD is an umbrella word encompassing—Dyslexia, Dysgraphia, Dyscalculia, Auditory Processing Disorder, Nonverbal Learning Disorder, Language Processing Disorder and Dyspraxia. A child is diagnosed with SLD only if s/he has near average or average IQ (intelligence quotient) exhibiting characteristic features of SLD. Sometimes above average and rarely gifted children may also exhibit SLD characteristic features.

Some factors that may cause SLD –

- Genetic factors
- Biochemical: faulty/inefficient brain functioning possibly due to Chemical imbalance.
- Biological: foetal distress during birth; brain injury trauma.
- Unfavourable uterine environment: adverse effect of drugs, smoking, alcohol on the brain development of the foetus.
- Other co-relatives: size of left hemisphere. Size of neurons in the left hemisphere.

I will be referring mainly to Dyslexia and Dysgraphia as for almost forty years I have been working with children with these conditions.

***Dyslexia:** is a language- based disability and here are a few pointers to be noted:

Poor reading:

- reading ability at least two years below age/grade expectancy, both in 'look and say' and 'phonic' method; difficulty in recognizing letters, sounds, associating/separating them within words; sounding words
- the words appear to be moving, the word seem to misbehave on the page
- hesitant /laboured reading, lacking fluency, intonation, speed

- missing out a line/ repeating the line
- skip words/ sometime substitute similar looking word—garden/grand
- sometimes substitute the whole sentence, “You are ugly go away.” was read as “You don’t look nice go away.”
- confusion with similar looking words- no/on; was/saw
- making anagrams of words- tired for tried
- misreads similar visual appearance-help / held, led/ let
- trouble rhyming

Spelling / Writing Difficulty:

- poor spelling performance
- confusion with letters that look alike – b/d, p/q, n/u
- mirror imaging letters/ words
- confusion with similar sounding words – our/are
- confusion with homophones – there / their
- confusion of vowel sounds (a,e,i,o,u) and their use as in Bad, bed, bid, bod, bud
- Using capital form of letter in a word- soNg, sTaNd
- phonetic spelling of non-phonetic words – people/people
- spell as the words sound-dance/ dans, more/mor
- no punctuation, messy writing with a lot of crossings
- syntax errors; difficulty in written expressions
- slower than others in writing task
- write in wrong order- time / tiem, child / chidl
- class work /Home- work often incomplete

Difficulty with Comprehension:

- Finding answers to questions; grasping the main idea,
- Recalling, remembering information from the paragraph,
- Have short attention span.

***Dysgraphia:** is a writing disability in which a person finds it hard to form letters or write within a defined space and here are a few pointers to be noted:

- Awkward /tight tripod grip, writing too large or too small or too far apart
- Untidy illegible handwriting with too many spelling errors, grammatical errors,
- No punctuation, omission of words, letter reversals in between words,
- Difficulty in expressing ideas, organizing and writing thoughts in sequence
- Avoid writing tasks as their muscular control (arm, hand, finger), hand-eye coordination and visual discrimination could be weak.

Strengths of children with Dyslexia: Weakness and shortcomings of a Dyslexic child are easily noticeable. It is equally important to know their strengths. It takes more effort to discover that. Nurture and project their strengths to establish self-worth to motivate and encourage them. Some of the strengths are that they:

- have vivid imagination
- think mostly in pictures instead of words, their picture thinking process can be 400 to 2000 times faster than verbal thinking
- are curious, intuitive, insightful and are highly aware of their environment
- can think and perceive multidimensionally
- It is worthwhile to share stories of achievers with dyslexia in the class for all to appreciate the condition.

Before starting the Individual Education Plan (IEP) for the child, it is best to observe the child's performance closely for a few days to verify what the child already knows. It helps immensely to know the language s/he is most comfortable with. Knowing the strengths, needs and learning style of each child is important. Establishing a rapport with the child is essential. This may take time, as the dyslexic child may have often been rejected, reprimanded, rebuffed and demeaned. Trusting someone doesn't come easily to him/her.

One must observe if the child is an introvert or extrovert; is s/he a visual learner, auditory or a kinesthetic learner. IEP must be developed keeping in mind the child's specific area of difficulty with long goals incorporating doable simple short goals to begin with so that the child succeeds.

Purposely give tasks that they can do, not ones they find difficult. Achievable goals develop confidence and boost self- worth. Appreciate, praise/ reward the child for every task done well instantaneously even if it is a tiny response. The aim is to motivate the child because one success leads to the next. The happiness on the child's face is your reward!

It is best to formulate tasks from simple to difficult, step by step without haste to introduce new concepts to keep up with the class. If the child fails, convey with care it is alright to make mistakes. Simplify the task, step wise to ensure success or change the activity then get back to the task later. Learning may not happen in a day. Willingness, patience, perseverance, gentle persuasion and consistency helps everybody concerned. It helps to be flexible and innovative.

Intervention 3

Class Management

Forming a team consisting of the teacher, parents, special educator/counsellor and peer group is the first step.

Parents: One must deal with defensive, non- accepting, laid back/helpless parents empathetically, politely but firmly. A continuous working partnership for the same goal makes it easier for all concerned and progress of the child becomes smoother. Parents could also be innovative and contribute immensely to the learning process of not only their child but others too. Small groups of parents could exchange successful strategies and motivate each other.

Peer learning helps in holistic development of all children. I have had the opportunity to successfully utilize peer group support as 'Little Teachers' in my classes to help their dyslexic classmates under guidance and supervision. It is important to carefully select empathetic, responsible students with good academic record as this is a meaningful task. Allocating particular subjects/activities to a set of peers who are good at it; is the way I have seen success happen.

After the peer finishes his work only then with the teacher's guidance/supervision the peer can help the dyslexic class mate. It brings out the best in both and creates a sense of belonging. Often the peer catches the difficulty being faced by his classmate easily and explains the concept in a manner that s/he understands it well. Peer learning if taken up seriously is a great supporting resource available in class. These 'little teachers' or buddies should also be given recognition through appropriate reward/ certificate/memento.

Must Remember:

- Just like every individual is different, no two dyslexics have the same needs.
- A dyslexic child carries a bag of some humiliating experiences. S/he is unsure of himself/herself.
- Some dyslexic children act as jokers in class, disrupt class, misbehave to distract and camouflage their short comings/inability to do given tasks. This could be mistaken for hyperactivity. Proper and timely diagnosis will certainly help. One such child is now an accomplished editor.
- They are not dumb/dull. They may be lagging in academics, but they may exhibit better emotional and creative intelligences. We must nurture these and provide opportunities to project it for getting recognition to boost their self -worth.
- They are slow in most tasks-reading, writing, copying notes, talking (mispronouncing, mixing up words, not finding right word)
- The regular students are not aware of dyslexic classmate's condition. Sensitizing them as and when required would create a more accepting atmosphere in the class.
- Sitting arrangement for the child in class then becomes much easier. Preferably sitting arrangement could be in the front row with a responsible peer. Later partners could be changed for social interaction.
- It is advisable for the seat to be away from the proximity of the window /door to avoid distraction.

- Another consideration for sitting is when the child is left- handed, if the desk is being shared then it is best to make the child sit on the left of his/her peer for free hand movement while writing.

Helpful Tips:

- Dyslexic children appear to be lazy and don't want to work after a short time. In fact they have to focus more, concentrate continuously, more energy is constantly used up and they get tired, often refusing to work. Let them work at their pace to begin with. Recognize this and arrange short breaks of some other relaxing activity that the child prefers. Make sure to provide some learning here, too!
- Give clear, short instructions calmly and slowly. Too many long instructions confuse the child due to short attention span.
- Dyslexic children are sensitive to loud/ aggressive voices. It not only confuses the child but saps his/her energy and self-confidence.
- When the child faces difficulty in reading it is advisable not to make him/her read in class till s/he is confident. The practice could be given in private by teacher / parent /special educator. To begin with, the use of finger to read is fine. It is a good idea to cover the next few lines so that while reading the child concentrates on what is visible and not get overwhelmed by the rest of it.
- While writing notes it is difficult to listen and write at the same time. Unable to keep track s/he leaves out word/words and line/lines. Best is to provide a xerox copy or provide peer help later. Use of ICT (information & Communication Technology) may be beneficial for some.
- Since the writing becomes messy and untidy, use of alternative lines while writing could help in neatness.
- Children with dysgraphia often find cursive writing easier than print writing as there is continuous movement in forming one word, only then, the pencil is picked up to write another word again in a continuous movement. This way child's writing speed becomes faster. The same happens during recitation and singing, there is continuous flow of verses/stanzas and the rendition feels good. (personal experience)
- Clearly written instructions on the board helps. However, a dyslexic child prefers colored (preferably green) board to black. The high contrast of tones black and white even on paper creates discomfort and concentration gets affected. They complain of strain and headache.
- Lack of hand-eye coordination creates problem while copying written material from the board or book accurately/completely. The child is under pressure while copying. While transferring into writing what is seen on the board, s/he may write down a bit then the mind is unable to retain the rest. When s/he looks at the board for further information, s/he fails to find his place. It is as if words disappear in its journey from the brain to the fingers. All this creates a lot of stress in such written tasks. ICT could

help but some children were found to be averse to it. Judicial use of ICT in a balanced manner could ease the situation.

Make Sure:

- Remarks like, "Pay more attention" or "Work hard" are not to be made to these children. They actually "***cannot*** pay more attention" as they have short attention span/poor concentration. Comments like this adds to their anxiety.
- During initial stages more individual attention is required. Parents could also be directed to do so. More care given at early stages strengthens their learning.
- **Teach them the way they can learn best and evaluate them the best way they can respond.** Providing a options like oral answers, objective written tests, project work through painting, poster, collage, etc. will help. Some could be comfortable with the use of ICT. Cues/prompts could be given for retrieval of information while reading a question depending on the requirement. Take care that it doesn't become a habit though.
- Make allowances, do not compare with others in class. Compare his/her previous work with the present, that too, with well thought out positive encouraging remarks.
- Avoid using a red pen for corrections all over the note book, the colour itself is a sign of danger. It is better to pick up a few important words/phrases for correction using another welcoming colored pen. The idea is to encourage child at every step.
- Constructive criticism in private is more effective as the child feels safe in a nonthreatening environment.
- Plan B is a necessity as dyslexic children get tired easily. They get stuck at times and don't want to continue with the given task. We could say at such times their switch is off. No matter what one does, the child refuses to work. We need to let it be and bring in plan B with something s/he likes to do. After sometime s/he may respond to the earlier task. We could say his/her switch is on!
- Make sure with our efforts we develop **'desire for learning'** in all children.
- Work towards making these kids independent. SLD students learn to compensate for their learning differences as they mature and can manage their lives very well. Our aim is to make them happy, healthy, productive human beings. Some of my dyslexic students are working as senior executives, one is an Editor with a leading newspaper and has cut music albums, one is a PhD from Japan, another one is a Fashion Designer, yet another is an accomplished beautician and the list is long!

Conclusion*:*

Acquiring knowledge on subjects, getting trained as teachers, gaining competency in technical knowledge are important for teachers. We, teachers, also require hands on training in non- technical skills to deal with situational responses that crop up often in

the class rooms. We are then equipped to ***reach the child through our emotional intelligence and not merely through the usual academic intelligence.*** *We learn to understand the child first instead of expecting to be understood. When we learn to be calm and peaceful, we create a welcoming atmosphere around us. By bringing emotions in learning through warmth and unconditional acceptance we create a much needed connect with the child. Personalizing our reaching out strategy not only benefits the needy children in class but all others, too!*

Learning is a life long process for all. However, as teachers we need to sometimes unlearn and re-learn as per the requirement. Self-appraisal is a practical way of reflecting upon our skills. It is a good idea to share successful / unsuccessful strategies. One may come across some interesting ways of handling SLD children in our classes.

As a responsible progressive teacher our duty does not end in the class room. We need to be proactive in sensitizing all the stake holders in school to make sure the existing system in school makes positive efforts to fit in with the requirements of the child and not the other way round. Presence of a counsellor and a special educator is a must. Ensure availability of or referrals for - occupational therapist, speech therapist, physio therapist and behavioral therapist We all must be aware of the Provisions granted for the specific disabilities. Ensure getting a disability certificate does not become an ordeal for the care takers of the child.

Be the change you want in others –

"A lamp can never light another lamp,

unless it continues to burn its own flame."

-Rabindranath Tagore

References*:*

Dr. Jitendra Nagpal et.al (2013). Expressions India (The National Life Skills Values Education, School and Wellness Program), *National Skills Training Workshop for Management of Special Education Needs, Emotional and Behavioral Problems in Children.* www.expressionsindia.org

Dr. Bharti et.al (2022). PRASHAST, A Disability Screening Checklist for Schools (Part-1 & Part- 2), Central Institute of Educational Technology, National Council of Educational Research and Training. https://ncert.nic.in/pdf/DSCS_booklet.pdf

Two Brain Theory and Dyslexia

Veera Gupta[1]

Abstract

Specific Learning Disability earlier known as Dyslexia has been recognised as combination of five conditions in varying degrees within an individual and among individuals. Till last decade, it was mostly deciphered by behavioural traits. Because there is no prescribed pathological or imaging test for its diagnosis. But now it is established as a neuroprocessing condition that impacts activities in life in general and academic activities in particular. The Split-brain theory of Dr. Roger Sperry in 1960 opened many doors to understand activities of two sides of the brain. It gave evidence that left brain is responsible for reading and right brain for other visual and perceptual tasks. Following on the lead of Nobel prize winner, many MRI images were collected of the activities of the brain of children with dyslexia and without dyslexia. The experiments have established that neurobiological differences exist. However, further research on genetic causes of these neurobiological differences is being carried out till today. The genetic assumption is based on the finding that the condition runs in the family. But so far, gene research has not been successful in identification of a gene responsible for the condition. Modern science has reported about the condition in various journals. In addition, we find that similar concepts in vernacular scriptures. It is mentioned that our two energy *nadies* called *Ida*, and *Pingla* represent Sun and Moon. One is outgoing and aggressive and other is reflective and receptive. It is another term used to express the same concept. There are no medical surgeries or pharmacy to cure or prevent the condition of SLD. However, there are a few therapies to create synergies in both sides of the brain to achieve symphony. The paper is based on the related literature. It presents detailed description of medical view on the condition. It also presents various available therapies to help prevent the condition.

Key words: Genesis of dyslexia, dyslexia and right brain, two brain theory of learning, vernacular therapies for dyslexia.

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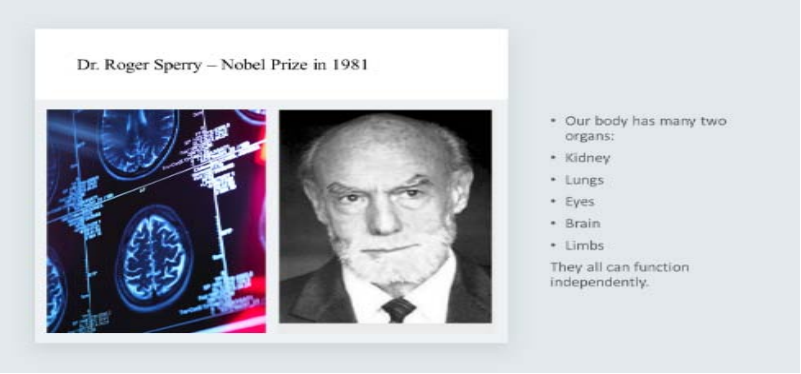
Introduction

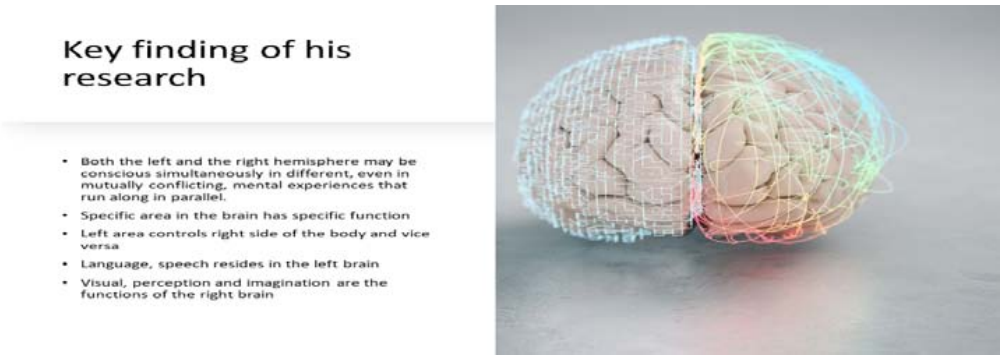
Yogic science has described human body beyond visible features of the body. One of the important features is energy centres. It is called *suksham*body. It consists of *Nadies* and C*hakras.*The earliest mention of suksham body is in *Upnishad* followed by other scriptures and discourses of religious gurus. The Indian Knowledge System describes the energy flow in the human body through 72000***Nadies***. Out of these, there are three mainNadies-***Ida***, ***Pingla*** and ***Sushumna.*** The Yogic science describes these as energy flow in the body. The energy flow through nadies and chakra is not discussed in the modern science. Modern science discusses visible organs in the body and their functions. Both the knowledge systems are important to understandSpecific Learning Disability (SLD). The two knowledge systems are complimentary and supplementary to each other and are very helpful to understand the condition of SLD.

Duality concept

The second concept of duality of the yogic sciences is also helpful to under the condition of SLD. It has gained importance as it has been proved by experiments in the modern science.The yogic science mentions duality residing side by side in one individual. There



are many examples to quote such as concept of '*Nar and Narishwer'*. It means different qualities residing in one individual. Interestingly, this concept of 'duality', has been researched extensively by neuroscientists. Dr. Roger Sperry was given Nobel prize on his theory of two brains. He said that our body has many two organs such as kidney, eyes, limbs, lungs also **the brain.**All these organs can function independently. He went on to explain different functions of the two brains with the help of his researches. He pointed out that two brains have distinct functions to perform. If one side is non-functional it may impair a few activities. Both the knowledge systems use different terms and present information. Yet, both the knowledge systems highlight presence of duality, different characteristics and strategies to balance the two.



The yogic literature of duality is summarised below in the context of modern theory of two brains for easy understanding:

Table -1 Duality of Energies, virtues or qualities of the two *sides* of the brain or two*Nadies*

	Ida *Nadi*	**Right brain functions as per Dr. Sperry**	**Pingala *Nadi***	**Left Brain functions as per Dr. Sperry**
1	Lies at left side of Spine	is responsible for processing visual construction tasks.	Lies at right side of the Spine	Recognises speech and language
2	Controls right side of the brain	Right brin controls left side of vision and motor skills	Controls left side of the brain	Analytical
3	Moon	Imaginative, intuitive	Sun	Detail Oriented
4	Shakti	Emotional	Shiva	Ordered, sequential
5	Ganges	Holistic	Yamuna	Rational, Logical
6	Feminine	Random	Masculine	Verbal, Planning
7	Cool	Non-Verbal	aggressive	Controls right side of vision
8	Intuitive	Creative, artistic	Logical	Controls right side of motor activities
9		Adventurous	Individualistic	
10		Impulsive	Ability to Plan	

The modern literature is not only suggestive of duality of characteristic but has proved that if colosseum which connects the two brains was cut during the experiments, the two parts of the brain could not communicate with each other. It affected the activities of the other side of the body. Also, a few types of activities could not be performed. The discovery of this knowledge is one of its kind of 'Aha' moment for the teachers. Teachers could understand the characteristics of different learners. It was illuminating for the teaching fraternity to resolve the issues of learning language and mathematics, a most common problem of the classroom. We may understand it with the help of a true story:

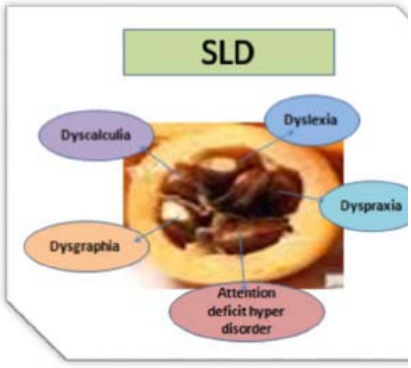
'*Pari did show letter reversals in her work. She wrote P as 9. She wrote M as W. Her writing was uneven. Letters were of uneven shapes and sizes. She never had appreciation of gap in between the letters. She wrote above or below the line as per her desire. She wrote very slowly. She used to bow down to the notebook so much that her head used to almost touch it. Her posture was always a concern. It raised doubts if she is having any problem with vision. Her hold on pencil was clumsy. Pari never sang any nursery rhyme. She never sang any film songs either. Her class work was never complete. She missed writing instructions for the homework. The mother used to go the houses of her classmates to copy the instructions of homework to get her complete the assignments. Sometimes, mother sat in the teachers' room of the school and copied the*

class work. Her spellings were wrong. She did not show understanding of phonetics in spelling. She wrote grammatically incorrect sentences. She made mistakes in copying signs in Math notebook which resulted in wrong answers. She was very uncomfortable with word problems. Her scores in dictation work were dismally low. Her scores used to range from 2 percent to 100 percent in tests and exams.'

The experiments on the brain told the teacher fraternity that Pari is right brain child. And all the activities that occur in the left side of the brain were causality with her. She was diagnosed by clinical psychologist as a child with Specific Learning Disability.

Specific Learning Disability

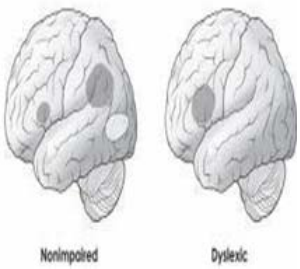
Poor reading -Dyslexia, poor handwriting- Dysgraphia, poor movement coordination - Aspraxia, poor mathematical ability-Dyscalculia and poor attention span - attention deficit disorder or ADHD constitute Specific Learning Disability. All these five conditions are grouped as ***Specific Learning Disability (SLD)*** as one umbrella term in latest literature and policy documents. Specific symptoms in behaviour can be located in varying degrees in children.



Box No:-1.3

Difference in the brain of Child with or without SLD

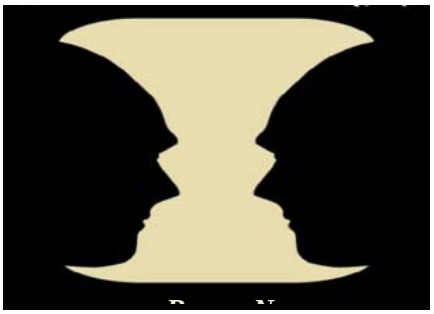
Having understood two sides of the brains, let us understand how these two-brain function. In our daily life and for most of our tasks, the two modes of the brain work together. Generally, if a task requires to work dominantly from one side of the brain, then that side of the brain gets activated. But in case the both sides of the brain require to be activated then link is very essential. As seen in Box no: - 1.1 the reading brain of nonimpaired is showing activity at three places. Whereas the activity in the brain of a dyslexic child is being showing at one place. That is the reason the that the child with dyslexia encounters the difficulty in reading.



Box No: - 1.1

Source:- dyslexiadaily.com

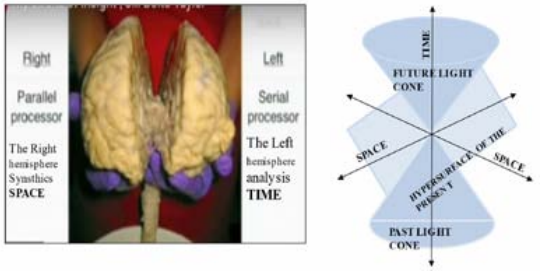
Generally, the shift is made easily. It is only in some of us that the shift is difficult to make. For example, if an artist is required to draw a picture which requires naming and drawing spaces in the art, He may find it difficult either to name to draw spaces. We are very much aware of a famous picture of two faces and a vase used to teach drawing (box 1.2). It



is to train both the sides of the brain for naming and drawing.

In another example we have seen that many artists are very comfortable to draw a upside down picture. Whereas a few artists find it very difficult to draw an upside-down picture. It is noticed that a person who's drawing a upside down picture is generally operating from the right side of the brain. Whereas the person who's drawing straight picture is operating from left side of the brain.

In the learning of a mathematical concepts, that requires knowledge of 'space and time' both at the same time, it is found that children with dyslexia struggle due to weak or non-existent connections between the two sides of the brain.



Box No:-1.3

Right Brain and Nonverbal thinking:

The right human hemisphere is all about this present moment. It's all about "right here, right now". It thinks in pictures and it learns kinaesthetically through the moment of our bodies. Information in the form of energy, streams in simultaneously through all of our sensory systems and then it explodes into this enormous collage of what this present moment looks like, what this present moment smells like and tastes like, what it feels like and what it sounds like. Human being is an energy being connected to the energy all around through the consciousness of his/r right hemisphere. We are energy being connected to one another through the consciousness of our right hemisphere. It is the wisdom given to us by out scriptures.

Left Brain and Verbal Thinking:

The left hemisphere is very different. The left hemisphere thinks linearly and methodically. Our left hemisphere is all about the past and it's all about the future. Our left hemisphere is designed to take that enormous amount of the information in the present moment and start picking out details. It then categories and organizes all that information associated with everything in the past we have ever learned and projects into the future all of our possibilities. The left hemisphere thinks in a language. It is that ongoing brain chatter that connects us with our internal world to our external world. For example, it's that little voice that tells us that we have to remember to pick up fruits on our way home. It's that calculating intelligence that reminds us when we have to do chores. It keeps us grounded to the present.

Role and function of two sides of the Brain

Having understood two sides of the brains, let us understand how these two brains function. In daily life and for most of our tasks the two modes of the brain work together. Generally, if a task requires to work dominantly from one side of the brain say left side or right side. Then the shift is made easily. It is only in some of us that the shift

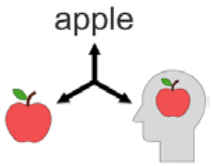
is difficult to make, for example if an artist has to draw a picture it will come easily to a right brain dominated person.

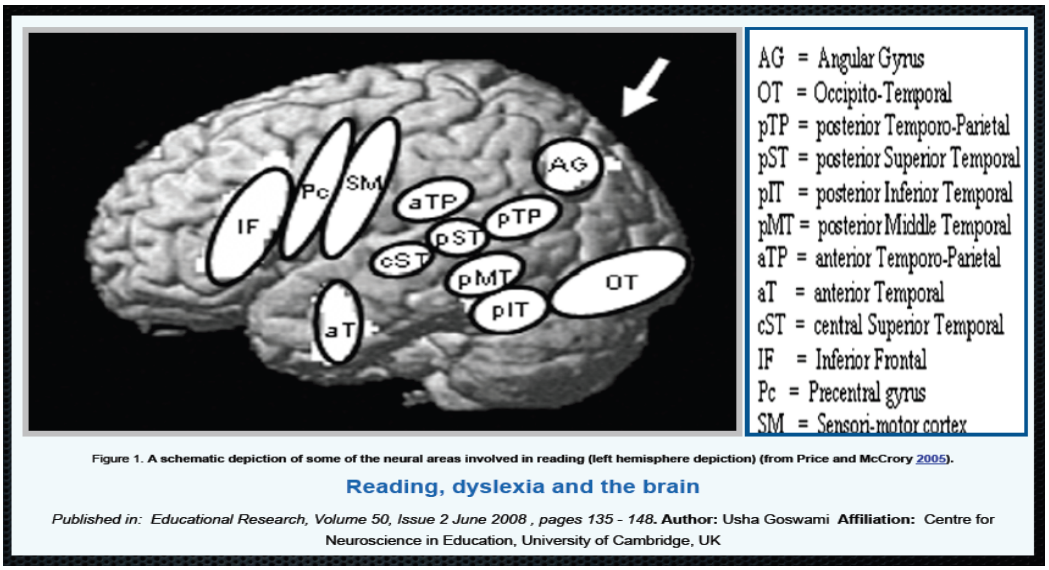
We see a ways first and maybe some of us see a two faces first in this optical illusion, if an artist is drawing that pictures from right side of the brain and later he is asked to name the parts of the picture maybe which required left side of brain than the shift could be difficult for the people who are dominated one by one side of brain for example if a person is right sided person he will find it difficult to name and if a person is working from left side of brain than the drawing will be difficult. In another example we have seen that many artists are very comfortable to draw a upside down picture whereas a few artists find it very difficult to draw an upside-down picture and it is noticed that a person who's drawing a upside down picture is generally operating from the right side of the brain whereas the person who is drawing straight picture is operating from left side of the brain.

Earlier it was not possible to understand/ visualise the shift or focus that is happening in the brain while performing an act except a few accomplished individuals who have noticed and described it. A known list of such writers includes names of Mystics like Sadguru, Dyslexia therapy founder Ron Davis, famous Scientist Einstein. However, images of MRI have made it simple for all to understand the processes happening in the brain.

Learning is a Cerebral Orchestra in the left brain

Learning occupies many parts of the brain. It is like orchestra,if one instrument is not proper the music quality will suffer. If a person sees an object say apple, he will recognise it from its shape, colour smell and store it in the left lateralised network of frontal, temporoparietal and occtitotemporal region. It is called semantic and memory part of learning. There are twelve parts in the left brain that help us to learn. These are as given in the following box. ----





Left Brain and Dyslexia

If a child is not able to receive and process stimuli in left brain he may not get meaning or sustain the information for long. As a result, will not be able to sustain in the education system. Because education system is designed for the functions of the left brain. It is possible to provide stimuli to left brain, correct its synergy with right brain. It is not yet experimented by the modern science. But it is well documented and practiced in yogic science. The activation of both the *nadies*through *pranayama* is not only practiced in yoga but has been adopted as powerful therapy practices by the modern therapists. The Ron Davis in his book mentions the role of *pranayams* in his book 'Gift of Dyslexia'. He also mentions about epic centre of the mind for learning and balancing of the two sides of the brain with the help of khoosh balls.

Conclusion

With the emerging evidences of neurobiology, it is more clearly articulated why there are different dominance of characteristics in an individual or among the individuals. Modern pedagogical interventions clubbed with yogic wisdom are helpful in developing skills which were dormant due to nondominant part of the brain. It is huge success in the educational and behaviour science. The knowledge of the condition, its root and intervention are a turning point for the development of the individual, education system, and for the society as a whole. It is being included as a subject in the educational programmes. It will result in more productive society and nation.

Reference

Berninger, V., & Richards, T. (2010). Inter-relationships among behavioral markers, genes, brain and treatment in dyslexia and dysgraphia. *Future neurology*, *5*(4), 597–617. https://doi.org/10.2217/fnl.10.22

Hebert, M., Kearns, D. M., Hayes, J. B., Bazis, P., & Cooper, S. (2018). Why Children With Dyslexia Struggle With Writing and How to Help Them. *Language, speech, and hearing services in schools*, *49*(4), 843–863. https://doi.org/10.1044/2018_LSHSS-DYSLC-18-0024

Ronald D. Davis (2003), The Gift of Learning, PenguinePublisher, ISBN 0-399-52809-1

Ronald D. Davis, 2010, The gift of Dyslexia

Sally Shaywitz, ( ) Overcoming Dyslexia

Schumacher, J., Hoffmann, P., Schmäl, C., Schulte-Körne, G., &Nöthen, M. M. (2007). Genetics of dyslexia: the evolving landscape. *Journal of medical genetics*, *44*(5), 289–297. https://doi.org/10.1136/jmg.2006.046516

Tokuhama -Espinosa, Tracy Harvard University Extension School (2019), Five Pillars of the Mind, Publisher Norton Professional Books, ISBN: 978-0-393-71321-3

Tokuhama-Espinosa, Tracey (2011). Mind, Brain, and Education Science: A Comprehensive Guide to the New Brain-Based Teaching. New York: W. W. Norton.

Veera Gupta (2019), Regulations on Inclusive Education, NCERT, Video at You Tube https://youtu.be/WG4m7VIEZiY

Veera Gupta (2019) Specific Learning Disabilities (Dyslexia) NCERT channel and you tube at https://youtu.be/mLmvYqU0plM

Veera Gupta (2021), Rights of Persons with Disability, Live session NCERT channel, 3 rd Dec.2021 International Disability Day at https://www.youtube.com/watch?v=f-bIS3OWq_YProject Encyclopedia (2022-01-12). ISSN: 1940-5030 https://hdl.handle.net/10776/13314

Walls, Sarah, "Roger Sperry's Split Brain Experiments (1959–1968) - Image".

Status of Policies for Students with SLD

Veera Gupta[1]

Abstract

A student with SLD can be helped if policies are framed, implemented, and made available to him/er. As there are multiple areas to be covered for help, there ought to be multiple variables as well. Further, in a democratic and federal structure of governance, policy formulation and policy monitoring are the responsibility of multiple agencies. Thus, it creates a complicated web of agencies as well as nature of policies. As a result, it creates hierarchy in policies. But, without the linear relationship between policies. A study was conducted to find out about the percolation of the policy after UNCRPD and RPwD Act in India. The objective was to study the areas of support covered in the contents of the policy. The second objective was to study percolation of these policies from national to institution level. The study has identified gap areas in the content and in the chain of the percolation. The gaps could explain as one of the reasons for the low achievement of the students with SLD in the educational institutions. The paper presents a detailed status of available policies to help a student with SLD in the educational institutions. The paper is based on the findings of a survey project, related literature, and case study of a few students with SLD. The paper is a guide to all stakeholders on legislative, regulatory, and executive policies related to provision available to a student with SLD in the education system from primary to tertiary level.

Key words: SLD and Policies; Examination policies and SLD; Policy gaps for the SLD; Provisions given in policies.

Introduction

The Journey of knowledge creation, its validation and dissemination by way of a policy is tedious and very long. It may stretch to centuries. The issue of Specific Learning Disability is one of the examples. As the knowledge about duality of characteristics in a human being had existed since time memorial. And it was rediscovered by German doctor Adolph Kussmaul in 1877 accidentally. He found that a patient could not read after an accident though he was literate and had good eye sight. Later in 1981,

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psychobiologist Roger Sperry discovered that human beings are of two minds. He found that the human brain has specialized functions on the right and left, and that the two sides can operate practically independently. The experiments proved useful to understand human behaviour. It resulted in to recognition of the specific behavioural condition as one of the conditions needing intervention and special attention. Consequently, it was recognised as one of the conditions of disability in the United Nations Conventions of Rights of Persons with Disability in 2006. It was included in DSM IV, 1994 and DSM V of 2013 of United Nations of America. It took that long for the knowledge to get solidify into a policy.

In India, after the ratification of UNCRPD, legal Act titled 'Rights of Persons with Disability' was passed in 2016. It was the beginning of formulation of regulatory and executive policies on SLD in India. It helped in identification of SLD as a disability. It was a leap jump in the arena of policies related to the SLD.

Types of Policies

In democratic governance, a policy goes through three organs of the governance. After the legal /Parliamentary /legislative policy, second organ is the judiciary. It passes order in the light of the Act. Accordingly, the third organ of the governance i.e executive bodies and its functionaries are supposed to formulate policies in the light of the Act. In this way all three organs formulate policies. Not only that, these three organs, again are consisting of different bodies that design policies with different nomenclatures. It is better explained with the help of examples. The policy making bodies, their types, nomenclature are given in the following table on policies for SLD:

Table-1 Policies on SLD by different Bodies

S.N.	level	types	Nomenclature	Example
1	International	Vision	Conventions	UNCRPD
			Treaties	SDG
2	National	Legislative	Act	RPwD
		Judiciary	Court orders	Judgements
		Executive	Regulations by UGC, Ministries	Identification regulation by Ministry of SJ & E
			Rules by Ministries; By laws by Examination boards	RPwD Rules Examination provisions
			Schemes by MoE; Schemes of MSJ& E; Schemes of UGC; Schemes of RCI	Inclusive Education SLD Scheme of UGC and MoE
3	State/ District/Institutional	Executive	Office Orders, notifications	

It can be inferred from the table that Policy is made at International, national, state, district and Institutional level by different agencies. These agencies can be broadly categorised into three: legislative, Judiciary and Executive. Further, policy is a generic term. It acquires its particular name as per its format. All policies are not in the same format. Some times these are in the form of law, Rules, Regulations, Grants, and Office order. Further, these are formulated by the government agency only that has jurisdiction over the subject and that particular region. The Constitution of the country has defined subjects and jurisdiction in the centre, state and concurrent lists. Therefore, the policy, policy formulation, policy content, policy implementation, policy monitoring are distributed tasks among multiple agencies. The structure of governance, makes it a complex subject to study.

As per the subject distribution by the Constitution, the 'Disability' is the 'State' Subject. That is the reason there were different policies at state level. That attributed to different outcomes. These need to get standardized after the legislation of the RPwD Act of 2016. The policy formulation has begun and is continuing ever since the RPwD Act of 2016 by the policy making bodies. However, it is not yet uniform across the country.

Having understood complexities of policy making, challenges are also because of the 'content' of the policy. The Disability in general, and SLD among the disabilities in particular is a complex subject for policy making. Therefore, the third challenge is related to policy content. Because, Policy Making is restricted to a few known areas of activities as per jurisdiction of that particular agency. For example, a particular agency is meant to regulate admission, second for the examination and third for the classroom interaction. As a result, Policies are not comprehensive enough to cover all the areas to facilitate a person with disability in the educational setting. For example, A public School is conducting test for admission in class two, the reservation for SLD is not available. Policy body for the admission is District Education Office or the school itself. Similarly, A child is given provision in the board exams but not in the internal exams up to class VIIIth. This discrepancy exists due to two policy making bodies for the two stages.

The fourth challenge is regarding percolation of the policies. Veera Gupta (2019) found that policy documents do not reach in the same number to the next ladder from the previous ladder. For example, if there are 50 types of documents at national office, only 35 are at state office, 15 at district and only one or two at school level.

The fifth challenge is linking of all the policy making bodies. If we keep a child with disability in the centre and identify needs for his/r holistic development beyond educational aspects, policy making becomes a herculean task. Apart from holistic development, even education development is bestowed with innumerable variables. An attempt is made here related to educational needs and related aspects to be covered by policy documents.

Variables of Policies for a Child with SLD

A human being develops from birth till death. Also, development is holistic meaning spiritual, physical, cognitive, social and economic. The policy content/text needs to be

available on every aspect. If any aspect is missing the development is a causality. The list of such variables is very long. The focus in this paper is on educational variables only.

Table -2 Variables to be covered by the Policy Documents

S.N.	Area	Variables
1.	Identification and Certification	Symptoms, Tests, Personnel, Agency, Report format, Age, Frequency
2.	Learning: Spaces and Strategies	Sitting arrangement, Acoustic, learning aids, learning strategies, learning plan, learning material, learning style, evaluation provisions, UDL, teacher training, support services, support personnel
3	Examination	Internal exam, public exams, competitive exams, recruitment exams, international exams
4.	Support services	Therapy, counselling, availability of medical and educational aids, ICT software, computers
5.	Employment	, Reservation, Accommodation, scholarship, fee ship
6.	Trained Personnel	Teacher, teacher educator, counsellor, clinical psychologists

The list is only suggestive and not exhaustive. From the case study of persons with SLD it is found that they are struggling for many facilities related to many variables mentioned above. Veera Gupta (2020) found that two important areas related to learning spaces are not covered in any policy document. It is an established knowledge that a child with SLD is a right brain child. He or she does not learn by phonetics. A Sound is received and interpreted in the left side of the brain. The education system uses lecture method most of the time. Therefore, sitting arrangement that allows the child with SLD to see facial expressions of the teacher and writings on the black board are important for his visual and perceptual abilities to get activated and make sense of what is happening in the classroom along with sound. Further, echo and extra sound are attention distractors more so in the case of a child with SLD.

Similarly, Other variables are also included or partly included in the policies made by the different executives. For example, Inclusive Education Plan, Universal Design of Learning, Use of ICT, Curriculum adaptation are not mandated by the directorates. On the other hand, provisions in the examinations are prescribed by the State Boards. But provisions to be given in the internal examinations up to class VIIIth are not prescribed by the State Directorates of Education. Same is the situation of the provisions, these are prescribed for some and are not prescribed for other competitive examinations. Moreover, SLD is not mentioned specifically, being hidden and newly recognised condition, person with SLD is made to run from pillar to post. Veera Gupta (2020) has analysed availability of policy variables in various policy documents. It found that gaps are wide and significant. Many persons with SLD suffer to get provisions even in the year 2023. The percolation of policy documents at the institution level, awareness and

implementation by the functionaries are found absent (Veera Gupta 2019). It may happen because policy formulation is a distributed task among bodies.

Policy Formulation Practices

Policy formulation is a top down approach. But let us understand it with the help of an example. Pari and Kamal are two five years old children. They are not singing nursery rhymes. They write alphabets in reverse order. Pari is administered a screening test by her school (school level Policy). But, Kamal is not given any screening test in his school. This discrepancy could have been avoided if there was a circular from Directorate of Education for Compulsory Screening of all children who are exhibiting deviation in learning for all schools. After Screening, medical diagnosis and certification of SLD was missing as late as up to 2020. A court order directed ministry of SJ & E to formulate regulation on it. Out of 21 disabilities, SLD was the last one to be regulated for its identification by the same Ministry.

Formulation of the circular/office order at Directorate level in time bound manner, its circulation to all and monitoring of its implementation is not a mandated practice. It is arbitrary. At present Inclusive Education is formulated as Grant in aid Policy by the Ministry of Education. It has SLD is one of the disabilities. Its monitoring is limited to fund utilization. There is no policy with respect to class room practices. Preparation of IEP, Curriculum Adaptation, UDL are academic content of the training programmes. There is no regulation as such on this. Provisions to be given in the examinations are included in the by - laws of the boards but for the lower classes, no policy order is issued to teachers.

After the ratification of the UNCRPD in 2006, it took 10 years to pass the RPwD Act, as there is no time line in the ratification to legislate. Similarly, after passing of the Act in the Parliament, Regulatory bodies, and Executive bodies also are taking time to further percolate the mandate. Accessibility Code is formulated by CBSE and notified in the Gazette in Jan2024. Other Executive bodies have to follow the same. Policy formulation is not monitored until and unless affected party goes to court for the relief. The Act visualised this dichotomy and provided for the disability commissions to monitor implementation of the RPwD Act. Nevertheless, activities of the disability commission are also restricted to granting relief to the aggrieved party then monitoring its implementation. For example, all educational institutions are supposed to formulate equity policy and display it. Many Institutions are yet to frame it. Moreover, it is again not checked for its comprehensiveness. Disability Audit is not in a practice in the educational institutions till today.

The next challenge is of Policy Formulation. It is a skill full task. It is taught in the administrative academies for the senior administrators. But policy formulation is not limited at that level. Policy is to be made at the institution level also. Not only that, even at classroom level for the child with SLD. A teacher, or even a principal is not empowered to make policies. They have the attitude of implementing orders received from the top. As discussed, a few variables are to be considered at grassroot level only.

These can not be prescribed at national or state level. These can only be broad in their scope. The specific use case wise is to be done at child level by the teacher. But Teacher is not empowered. Veera Gupta (2019) found in her study that policy documents are neither sent to institution level from the state. If sent, the language of the document remains English which is not understood by the local functionary or beneficiary in many parts of the country. In such a situation the use of the policy is sacrificed.

Policy Use

Policy if not used, has no value. There are enumerable examples on dormant policies. One case study is as follows:

Ram is student of class XTh of KVS in Dehradun. He has diagnosis report for his SLD from the Govt. Hospital. He applies for examination provision to Regional Office of CBSE. The office is not aware of this condition and refuses to entertain him. He had to go to the head office of CBSE to report the matter during crucial days before the examination to get it done. A policy percolation failure!

Veera Gupta (2020) found that the Learning Spaces and Learning Processes are not available for the CwSLD. Further, to corelate the survey findings, **no** national data is available. There is national data base available called National Assessment Survey (NAS) conducted by NCERT to learn about achievement levels of students in elementary classes. Unfortunately, it is not available on CwSLD as one of the categories. Second data base is UDISE. The latest report available is of the year 2020-21. The report presents data related to enrolment, availability of toilets, identification of hard spots in learning and availability of psycho social facilities. **The data on enrolment is not a measure of learning**. It could be best only a measure of retention. Similarly, other variables captured are not sufficient to use for the benefit of a child with SLD. The Student Database Management Information System (SDMIS) has been started in 2017 which is to capture more variables related to CwSLD but it is also not complete and not yet available in public domain. School card under UDISE also gives number of students enrolled disability wise and not learning outcomes. Child tracking systems are being initiated. A fully developed system of the child tracking will help policy makers and implementers to study policy gaps to frame more policies.

Gaps and Recommendation

The RPwD Act has included SLD as a term distinctively. But has put it as sub category of the Intellectual Disability. The category of Intellectual disability has two sub categories. One of them is SLD. The definition of Intellectual Disability also covers traditionally known mental retardation caused due to low IQ. Whereas, the two sub categories mentioned i.e. SLD and Autism are not due to low IQ. Rather are found having high IQ. The DSM V categorically mentions that. Because of its placement in the category of Intellectual Disability, it is not being given its due space in subsequent policies. The latest example is Accessibility Code of 2024. Wherein each disability is discussed more from the point of view of infrastructure. It reads as '*For children with Intellectual Impairments -Since this section mainly focuses on adaptation in teaching learning*

processes, the following need to be emphasized: · Ensure that visual, tactile and pictorial learning aids are available and accessible. · Level of difficulty of both language and content need to adapt as per the comprehension level of the child. · Use of concrete objects as TLM, needs to be emphasized. · Enough time for individualized teaching learning opportunities · Based on the ch ild's level of understanding, the content and evaluation should be adapted. (For example-numbers of concepts taught could be reduced if required; questions could mainly be multiple choices/ fill in the blanks, etc).

These recommendations may be adequate for low IQ or for slow learners. But, for a CwSLD, these are not sufficient. He may need all learning facilities that are needed for a child with visual impairment or with a hearing impairment but also needs more input that is needed for a gifted child with higher order of abilities. This is a paradox in understanding that need to be understood and catered to in policy documents.

Besides that, in policy formulation, it is time that bottom up approach be used. Keeping the CwSLD in centre, services surrounding the CwSLD, providers to be monitored by the respective regulatory body. For Example, UDISE is providing data on psycho social services available in 10 percent schools in the country. The qualification, recruitment, services, monitoring of counsellors is also to be regulated. At present, there is no such regulation.

Linking all regulatory bodies variable wise is no one's job. Each body is working in its cocoon or in its tower. Policy making is a subject which needs to be introduced in the educational sector. Because policy is the main tool and technique in a democratic governance. It is a step in the direction of, achievement of the targets of equity and quality of services for a person with disability across the country.

References

MOE, Gazette of India on Accessibility Code Jan 2024

MOE, UDISE 2020-2021

Veera Gupta (2019) on "A study of Policies and Practices for Inclusion of Children with Specific Learning Disabilities" NIEPA, Unpublished 2019

Veera Gupta (2020) Accessibility of Learning Environments and Learning Processes to Children with Disability, 2020, AIAER Vol 32 no. 1& 2 June and Dec. https://aiaer.org/wp-content/uploads/2021/08/Vol.-32-2020.pdf

Decoding Specific Learning Disability (SLD)

Jessy Abraham[1]

Abstract

Department of teacher training and Non-Formal Education(IASE) is offering BEd Special education with two specializations, i.e. Visual impairment and Learning disability, since 1982.The Viksit Bharat Agenda cannot be achieved without inclusive education, and universal elementary education. The rights of persons with Disabilities Act (RPwD),2016 has included the SLD is one of the Disabilities. The definition of SLD clearly distinguish from other neuro developmental disorders.(DSM-5, American Psychiatric Association, 2013). In the history of SLD,there are three strands of phenomenological inquiry that resulted in the definition and conventions in the field of SLD: such as the medical, the Psychiatric and academic skills strands. Although the SLD was not included in the list of disabilities in US in the Education of Handicapped Act 1966, later Individuals with Disabilities Education Act (IDEA) 1975, included by the initiatives of Association of Learning Disability. India also in the list of Disabilities in Disabilities Act 2015((RPwD,2016), SLD is included. Some suggestions for facilitating the education of children with SLD

Introduction:

Department of Teacher Training and Non-formal Education, one of the Departments of Faculty of Education of Jamia Millia Islamia, a central university prepares teachers for all levels of schooling, such as the foundational stage, preparatory stage, middle and secondary stages through the Diploma in Elementary Education, Bachelor of Education (BEd) General for preparing teachers for the secondary level and BEd Nursery for the foundational level. While describing teacher training in special education, the National Commission on Teachers-1(Chattopadhyaya Commission) (1983-85) mentions Jamia Millia Islamia as one of the two such institutions that prepare Special teachers in the north India. We have been offering BEd Special education with two specializations, i.e. Visual impairment and Learning disability, since 1982. We have more than 100 PhD scholars doing research in various areas of teacher education.

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India Government aims to make India a developed nation by 2047, known as the 'Viksit Bharat 2047', and it requires concerted effort from all sectors, including education in all aspects of teaching-learning, including the education of exceptional children. Education is a strong medium for social change, so it is essential for national development. Education equips learners with the skills necessary for living and working with dignity and contributing to the development of society. At the core of all education systems for providing education to children with disabilities is the Universal Declaration of Human Rights 1949, article 2 of the Right of the Child, which states that children have the right to receive education that does not discriminate on grounds of disability, ethnicity, religion, gender and so on. The Jomtien World Conference on Education for All (1990) set the goal of universalising elementary education, and India endorsed it. The principle of Inclusion was first adopted at the Salamanca World Conference on Special Needs Education 1994, which meant that all schools should accommodate all children regardless of their physical, intellectual, social, emotional, linguistic or other conditions.

The Constitution of India (Articles 15 and 16) guarantees all citizens equality before the law and prohibits discrimination based on religion, caste, or other factors. The Persons with Disabilities Act 1995 provides equal opportunities, protection of rights and full participation for persons with seven disabilities (PWD), which was revised in 2016 as the Rights of People with Disabilities Act 2015((RPwD,2016). The SLD is one of the Disabilities included in this Act.

"Specific Learning Disability" (SLD) is the terminology used to distinguish this from various categories of Learning Problems caused by conditions like mental retardation, behavioural disorders, lack of opportunity to learn or any primary sensory deficit. This disability is due to a condition in which one or more of the basic psychological processes involved in using the Language, spoken or written, is affected in such a way that it may manifest itself in an imperfect ability to listen, think, speak, read, write, spell or do mathematical calculations. Through various research studies, the lack of effort on the part of the learner as the cause of underachievement was ruled out.

There are various Neuro-developental disorders such as intellectual disability, communication disorders, autistic disorders, attention deficit disorders and specific learning disorders.

SLD are recognized worldwide as a heterogeneous set of academic skill disorders represented in all major diagnostic nomenclatures, including the Diagnostic and Statistical Manual-5 (DSM-5, American Psychiatric Association, 2013) and the International Statistical Classification of Diseases and Related Health Problems (ICD-11, World Health Organization, 2018).

The SLD has three specific situations, such with impairment in reading, with impairment in written expression, with impairment in mathematics. The Impairment in reading include reading accuracy, reading rate or fluency or reading comprehension. Impairment in written expression include spelling accuracy, grammatical and punctuation accuracy, and organisation of written expression. Impairment in

mathematics include number sense, memorization of arithmetic facts, accurate or fluent calculation, accurate math reasoning. (DSM-5, American Psychiatric Association, 2013)

A Brief History of SLD:

There are three strands of phenomenological inquiry resulted in the definition and conventions in the field of SLD: such as the medical, the Psychiatric and academic skills strands. The oldest one, *a medical strand, originated in 1676, when Johannes Schmidt described an adult who had lost his ability to read (but with preserved ability to write and spell) because of a stroke*. in this strand remerged in the 1870s with the publication of a string of adult cases who had a stroke or traumatic brain injury and of the children who were unable to learn to read despite success in mathematics and an absence of brain injury, which was termed *"word blindness" (W. P. Morgan, 1896).*

The second strand is from the American Psychiatric Association's Diagnostic and Statistical Manual (DSM) in its first edition (DSM-I) gave a category of chronic brain syndromes of unknown cause now known as Attention Deficit Hyperactivity Disorder (ADHD). DSM 5 has given under the classification of Neurodevelopment disorders with intellectual disabilities, communication disorders, Autism Spectrum Disorders, Attention-Deficit/Hyperactivity Disorders , Specific Learning Disorder etc.

The third strand belongs to educational interventions based on cognitive and linguistic models of observed academic difficulties, endorsed in the 1960s by Samuel Kirk and associates, viewed SLD as an overarching category of spoken and written language difficulties that manifested as disabilities in reading (dyslexia), mathematics (dyscalculia), and writing (dysgraphia). Samuel Kirk presented a paper entitled "Learning Disabilities" at the conference on the Problems of Perceptually Handicapped Children in 1963; based on his Book *' Educating Exceptional Children'* the term LD was used for the first time. Kirk (1962) defined learning Disability as retardation, disorder or delayed development in one or more of the processes of speech, language, reading, writing, arithmetic or any school subject due to a possible cerebral dysfunction and disturbance. The condition should not be due to a sensorial disability, cultural deprivation or instructional factors.

In 1964, ability-achievement discrepancy was associated with specific learning disability identification by the efforts of Dr. Barbara Bateman who was associate of Kirk.

The Elementary and Secondary Education Act of 1965 (ESEA) distributed federal funds to public schools, which provided funding for supplemental educational services, educational research and training, and special education services. The Education of Handicapped Act 1966 did not include protections for students with specific learning disabilities. The Children with Specific Learning Disabilities Act of 1969 included a working definition of learning disabilities within the Federal law. With this definition a medical cause was presumed, though the focus was on the remedial education designed to address the unique needs of children with learning disabilities. Individuals with Disabilities Education Act (IDEA) signed in 1975, along with the Education for All Handicapped Children Act of 1975 established criteria for identifying all exceptional

children, including those with Learning Disabilities (L.D), to provide Free and Appropriate Public Education (FAPE). The participants accepted the term LD and formed an Association known as the Learning Disabilities Association (LDA) (Scanlon, 2013).The Learning Disabilities Association of America was a key advocate in ensuring that specific learning disabilities (SLD) were a category protected and included in the IDEA. Today, students with specific learning disabilities are the largest category protected by the IDEA. The Education for All Handicapped Children Act (EHA) was reauthorized, and the name was changed to Individuals with Disabilities Education Act (IDEA). The 1990 reauthorization also stated that part of a student's Individualized Education Plan must include an Individual Transition Plan to help the student to transition to post-secondary life.

The 2001 No Child Left Behind Act (NCLB) aimed to get every child to grade-level in reading and math by 2014 included students with disabilities in their accountability measures, and resulted in the interventions and accommodations necessary to allow students with SLD and other disabilities to achieve higher academic standards. IDEA was reauthorized and included an addition of response to intervention (RTI) that could be used in identification of students with learning disabilities.

There were many more definitions of the term LD. Still, the most important is from the Individuals with Disabilities Act 2004 (IDEA, 2004), which refers to a specific LD (SLD), which indicates that a disability or disorder affects a specific academic area or skills. The definition of SLD given by IAEA (2004) includes conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia and developmental aphasia. The SLD does not include learning problems due to visual or hearing, motor disabilities, mental retardation, emotional disturbance or cultural, environmental or economic disadvantage.

Children with SLD manifest underachievement, and the prevalence of learning disability among Indian children ranges from 2.16% to 30.77% across the studies (Joseph &Devu, 2022).

History of SLD in India

The concept of Specific learning disability is new India. The term was included in the revised Persons with Disability Act of 1995, later in 2015. But there are many policy initiatives in India for the education of the disabled such as National Policy of Education, 1986 and its revision in 1992, The Rehabilitation Council of India Act (1992), The National Plan of Action (1992) The Right of Children to Free and Compulsory Education Act (2009),National Policy for Persons with Disabilities(2006), National Policy on Education (2020). There are many national Schemes for the education of the disabled such as Scheme of Integrated Education for Disabled Children (IEDC) by Department of Social Welfare (1974) and the Department of Education (1982), Project Integrated Education for the Disabled(1986), District Primary Education Programme (DPEP) in 1994,Sarva Shiksha Abhyan(SSA) in 2004, Action Plan on the Inclusion of Education of Children and Youth with Disabilities prepared by the Ministry of Human Resources

Development in 2005,Assistance to Disabled Persons for Purchase / Fitting of Aids and Appliances (ADIP Scheme), Deendayal Disabled Rehabilitation Scheme to promote Voluntary Action for Persons with Disabilities (DDRS Scheme), National Awards and National Scholarships for persons with disabilities by Ministry of Social Justice and Empowerment, "Unique ID for Persons with Disabilities"(UDID) project is being implemented by Department of Persons with Disabilities with a view of creating a data base and to issue a Unique Disability Identity Card to each person with disabilities. The National Institute for the Empowerment of Persons with Intellectual Disabilities (NIEPID) covers SLD, as the RPwD Act 2016 included SLD along with other intellectual disabilities.

With improved awareness about SLD, and appropriate remedial measures, more children with SLD will benefit as in the case of US where half of the children who benefit the supportive care belongs to SLD. Nearly 8% of children up to 19 years have SLD Scaria et.al (2023).

To conclude, we could act as enabler for facilitating the education of the children SLD, some suggestions are:

- **Flexibility in admissions:**

Flexibility in admissions is mentioned in the Right to Education Act(2009) about no denial of admission on the basis of caste, race, religion, gender or disability and about the reservation of 25 % of seats in private schools for the Disadvantaged Group or the Economically Weaker Section of the society, which also includes the children with disabilities. The schools have accepted this policy, awareness regarding this should be provided to all stakeholders.

- **Flexible Teaching Methods:**

Flexibility in teaching-learning method to suit different learning style learners viz. auditory, visual, kinaesthetic learners and appropriate for different types of SLD. Universal Design for Learning is an effective way; there should be many digital interventions or assistive technology. Teacher training and in service programs should provide the necessary exposure.

- **Flexible Curriculum:**

The curriculum should have combinations of altered content, conceptual difficulty, educational goals, and instructional method versus building scaffolding and bridges between the existing curriculum and people involved in the educational process. The policy makers who develop curriculum frameworks should take this in to account.

- **Sensitizing Mainstream Teachers:**

As teachers are the natural change agents who could transact the policy and schemes at the ground level of the inclusive classroom, they must be sensitised towards the unique needs of differently abled children, especially the SLD children whose disability is not apparent but hidden, the teacher should be able to identify and handle them while

teaching-learning as per the needs and tackling the behavioural issues in a general classroom

- **Revamping Teacher Education:**

The teacher education, both in service and pre-service components, should sensitise the teacher regarding the characteristics and identification of SLD and teaching strategies suitable for this condition.

- **Community Partnership:**

Inclusive education is not possible without the support and assistance of the parents and members of the local community

- **Collaboration with schools and universities.**

Without the support of the educational institutions, it is impossible to identify the SLD children as most of the parents may be ignorant about this issue. When they are identified, the strategies appropriate for the specific situation could implemented.

References:

American Psychiatric Association(2013) Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. Arlington, VA, American Psychiatric Association, 2013.

Joseph, J. K., & Devu, B. K. (2022). Prevalence and pattern of learning disability in India: A systematic review and meta-analysis. *Indian Journal of Psychiatric Nursing*, *19*(2), 152-162.

McDonough, E.M., Flanagan, D.P., Sy, M., Alfonso, V.C. (2017). Specific Learning Disorder. In: Goldstein, S., DeVries, M. (eds) Handbook of DSM-5 Disorders in Children and Adolescents. Springer, Cham. https://doi.org/10.1007/978-3-319-57196-6_4

Morgan (1896) cited in Understanding, Educating, and Supporting Children with Specific Learning Disabilities: 50 Years of Science and Practice - PMC

Read more at: https://www.deccanherald.com/india/explained-what-is-viksit-bharat-2047-and-what-does-it-aim-to-achieve-2920441

Scanlon, D. (2013). Specific learning disability and its newest definition: Which is comprehensive? And which is insufficient?. *Journal of learning disabilities*, *46*(1), 26-33.

Scaria, L. M., Bhaskaran, D., & George, B. (2023). Prevalence of Specific Learning Disorders (SLD) Among Children in India: A Systematic Review and Meta-Analysis. *Indian journal of psychological medicine*, *45*(3), 213–219. https://doi.org/10.1177/02537176221100128

Mindfulness based Programmes: An Intervention to address Social Emotional Deficits among Students with Nonverbal Learning Disabilities

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Abstract

Specific Learning disabilities are prevalent among students regardless of their native language and the language of instruction. Globally, the estimated prevalence of specific learning disabilities (SLD) ranges from 5% to 15%. In Indian context, SLD affects approximately 3% to 10% of children. Students with Nonverbal Learning Disability (NLD: subtype category of LD) face challenges in social interactions as they struggle to identify or interpret nonverbal signals from others, including facial expressions, gestures, body language, and tone of voice. The difficulties in social perception often led to repeated rejection, causing individuals with NLD to experience social withdrawal, depression, and other socio emotional disturbances. In spite of the wide prevalence, Nonverbal Learning Disability (NLD) frequently goes undetected or receives inaccurate diagnoses, primarily due to factors such as insufficient awareness about the condition and confusion surrounding diagnostic criteria. As a result, children with Nonverbal Learning Disability (NLD) seldom access suitable educational or therapeutic interventions, further increasing their vulnerability to socio emotional challenges in an inclusive classroom. The article presents numerous mindfulness strategies that can be incorporated by the schools in an inclusive educational setting to help nonverbal learning disabilities struggling with social emotional learning problems and improve the positive social and emotional functioning.

Key words: Specific Learning Disabilities, Non-verbal Learning Disabilities, Social-Emotional Learning, Stress, Mindfulness- Based Strategies.

Introduction

The concepts of learning disorders, learning disability (LD), and learning difficulty are though used in practical scenario in an interchangeable manner but there exists a substantial difference in these three terms. The term "disorder" suggests the presence

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of significant academic challenges in children, in spite of not necessarily accounting for an official diagnosis. It is a medical term present in official guide lines for mental health professionals like International Statistical Classification of Diseases and Related Health Problems and Diagnostic and Statistical Manual of Mental Disorders.

Despite the inclusion of Specific Learning Disabilities (SLD) in the Rights of Persons with Disability Act of 2016 in India, the screening and diagnosing process for SLD is intricate. Different assessment tools, such as the SLD: Comprehensive Diagnostic Battery by AIIMS and Index for SLD by the National Institute of Mental Health and Neurosciences (NIMHANS), are commonly used, each with its own strengths and limitations. However, there exists a problem of a lack of well-established standards for various sub-types of SLD. Moreover, there is also notable absence of a screening tool for educators for the identification of SLD. Further different boards of education (both state boards and central boards) follow different levels of academic curriculum. For instance, tool NIMHANS Index for SLD can be administered only in schools with English as medium of Instruction, while around 42% of students in India study in schools with Hindi as medium of instruction. Although several tools are developed in regional languages like Marathi, Kannada and Tamil and there is a lack of acceptance at national level of these tools for diagnosing and certifying children with SLD. In India, the reported prevalence of Specific Learning Disabilities (SLD) ranges from 3% to 10% (Ramaa, S. 2000). Six researches within the systematic literature review examined diagnostic screening results of approximately 8000 children. According to the meta-analysis focusing on random-effects, the prevalence of Specific Learning Disabilities (SLD) was found to be 8% in India (Scaria et al. 2023). Educating children with specific learning disabilities in the inclusive settings has increasingly been identified as a priority in National Education Policy 2020. However, in inclusive settings, students with learning disabilities encounter a distinct set of challenges different from those faced by their peers without disabilities. To address these difficulties in the effective manner, there are number of strategies which have come up in the works of researches and experts working in the area. One of the significant aspects being explored in this area deals with the Mindfulness as an effective intervention tool. The core purpose of this paper is to discuss numerous mindfulness strategies to help specific subtype category of Learning Disability, namely nonverbal learning disabilities struggling with social emotional learning problems and improve the positive social and emotional functioning.

Social-Emotional Learning

Over the past two decades, research has extensively documented the social challenges faced by many students diagnosed with learning disabilities (LD). Comparison studies have revealed that children with specific learning disorders (LD) exhibit higher levels of inappropriate behavior compared to their peers without disabilities. These difficulties manifest in outer behaviors manifested in the form of fighting or disruptive actions and in internal behaviors in the form of anxiety and depression.

Researchers and experts in the area have defined social and emotional learning (SEL) as the capacity for both adults and children to comprehend, manage, and express

individual emotions; cultivate, nurture and sustain positive relationships; plan and achieve goals; and take responsible decisions. Kavale, K. A., & Mostert, M. P. (2004) highlighted number of Social Skills essential for effective functioning which include: Asking a question, working cooperatively, Controlling Anger, Feeling and Responding to aggression, dealing with frustration, responding to failure, using self-control, Decision-making, starting a conversation, learning how to listen, asking for help, expressing ones feelings, apologizing, goal setting, introducing oneself and negotiation.

The Collaborative for Academic, Social, and Emotional Learning (CASEL, 2020) identifies five interconnected competencies which are fundamental to social and emotional learning:

- Self-awareness: This includes 'Recognizing one's emotions, accurately assessing interests and strengths, and maintaining a well-founded sense of self-confidence'.
- Self-management: This includes 'Regulating emotions to handle stress, controlling impulses, motivating oneself to persevere in overcoming obstacles, setting and monitoring progress toward personal and academic goals, and expressing emotions appropriately'.
- Social awareness: This includes 'Taking the perspective of and empathizing with others, recognizing and appreciating individual and group similarities and differences.
- Relationship skills: This includes 'Establishing and sustaining healthy relationships based on cooperation, resistance to inappropriate social pressure, managing and constructively resolving interpersonal conflict, and seeking help when needed'.
- Responsible decision-making: This includes 'Making decisions by considering all relevant factors, including ethical standards, safety concerns, and social norms; anticipating the likely consequences of alternative courses of action; and showing respect for others.

In spite of the area, gaining momentum, problems concerning social emotional skills prevalent among the nonverbal learning disabilities is a least explored area of research in this field. It is estimated that in all, one third of youth and children fall into a specific sub-type category of Learning Disability including social-emotional disabilities and nonverbal learning disabilities (Telzrow & Bonar, 2002; Morris, 2002; Elksnin, et al., 2004).

Non-verbal Learning Disabilities and Social Emotional Deficits

Nonverbal Learning Disability is primarily characterized by deficiencies in problem solving, arithmetic, perceptual-motor, perceptual-cognitive, and social-emotional skills. Supporting this, meta-analysis undertaken by Kavale and Forness (1996) highlighted that approximately 75% of students with LD shows deficits in social skills. Individuals with nonverbal LD often lack social competence, struggle with poor social perception and they often face difficulty in understanding and attending to the body language of others,

facial expressions and prosody. They frequently struggle to accurately interpret social exchanges, leading to challenges in determining appropriate behaviors and they often end up with inappropriate or atypical actions in social situations. Consequently, they experience repeated isolation, neglect, and ostracism from their classmates (Little, 1993). These experiences on negative front are associated with heightened levels of depression, anxiety and sometimes suicide attempts (Fletcher, 1989; Rourke, Young & Leenars, 1989). Rourke, Young, and Leenaars (1989) have identified various neuro-psychological characteristics of individuals with nonverbal LD, including difficulties in adapting to new and complex situations, age-appropriate sensitivity to humor, understanding cause-effect relationships, forming concepts, testing hypotheses, interpersonal skills, mechanical arithmetic, nonverbal problem-solving, psycholinguistic pragmatics, speech prosody, and social judgment and perception. The consequences of nonverbal LD often manifest in the form of isolation, depression, and withdrawal, with internalized psychopathology being common problem across the board and an increased risk of suicide for these individuals.

Visser et al. (2020) emphasized that approximately 20% of students with specific learning disorders met criteria for disorders related to anxiety, and about 30% exhibited symptoms pertaining to depression. Willcutt and Pennington (2000) documented elevated levels of anxiety along with depression in adolescents and children facing reading difficulties. Nelson and Harwood's (2011) meta-analysis indicated high score on anxiety among children having learning difficulties compared to their non-affected counterparts. Additionally, learners who struggle across areas reported comparatively lower levels of school well-being (Ingesson, 2007; Benassi et al., 2022). Several researches also indicate a co-occurrence of externalizing behaviors with learning difficulties. Kavale and Forness (1996) in their study report that about 75% of learners with learning difficulties experience social behavior problems. Further, Visser et al. (2020) in recent study identified high rates of conduct disorder and attention-deficit/hyperactivity disorder (ADHD) in children having specific type of learning disorders. On a similar note, Willcutt and Pennington (2000) reported that students having reading difficulties were more likely to have criteria for attention deficit hyperactivity disorder, oppositional, and conduct disorders. Dietz and Montague (2006) demonstrated high levels of comorbidity between ADHD, behavioral and emotional disorders, along with LD. Horbach et al. (2020) discussed the moderating role of ADHD in the relationship between specific learning disorders in the area of reading/spelling and specific behavioral difficulties. Existing research consistently highlights the challenges faced by children with mild and learning disabilities in understanding problem-solving and nonverbal cues (Cartledge et al., 1996; Forness & Kavale, 1996; Nixon, 2001). Students with LD also struggle with tasks requiring attention, peer acceptance and social communication, (Nixon, 2001). These difficulties may contribute to heightened anxiety related to social demands, potentially leading to suicide or attempts for suicide, even when clinical depression is absent. The persistent failures in coping with social difficulties, coupled with feelings of emotional distress and inferiority,

are at greater risk of suicide as noted within the population having nonverbal learning disability (Porter & Rourke, 1985; Rourke, 1987).

Children with learning disabilities often face social rejection from their peers, and researchers exploring the reasons behind this rejection suggest that underdeveloped social-emotional skills may be a contributing factor. Studies indicate that children having nonverbal learning disabilities are at a higher risk of suicide mainly because of the dysfunctionality in the brain in right hemisphere. (Rourke, Young, Strang, & Russell, 1986, Rourke, Fisk, & Strang, 1986; Rourke & Strang, 1983; Rourke, Young et al., 1989;). Nonverbal learning disabilities are mainly associated with right hemisphere dysfunction (Rouke, 1987), impacting an individual's ability to effectively adapt to environmental limitations and limiting coping strategies. Johnson and Myklebust (1967) proposed that these deficits in social skills represent a neurological learning disorder specific to learners with Learning Disability.

Mindfulness-based Intervention for NVL Disabilities

While there is no complete cure for specific learning disabilities (SLD), there exist interventions designed to address the underlying issues. These interventions aim to assist children with SLD in adapting, achieving academic success, and leading fulfilling lives. Mindfulness, considered a powerful practice and tool aligned with Social and Emotional Learning (SEL), shows promising prospects in reducing difficult and challenging behaviour among students. The integration of mindfulness into the classroom setting can enhance awareness of oneself and relationships with people around, potentially fostering learning across various subjects for all students, including those with learning disabilities.

According to Wardle & Weinhardt (2013), mindfulness is the scientific practice of being attentive in the present moment, observing both internal and external experiences without judgment. Pioneer work done by Kabat-Zinn (1994) defines mindfulness as the intentional attention to the present moment without any kind of judgement. This involves maintaining awareness of thoughts, emotions, bodily sensations, and the surrounding environment. The fundamental premise of mindfulness techniques involves deliberately focusing on internal and/or external stimuli with complete concentration. There are three basic steps in mindfulness as outlined by Zylowska et al. (2008): directing focus to an "attentional anchor," observing distractions without attachment, and redirecting attention back to the attentional anchor. Rechtschaffen (2016) categorized mindfulness into five core concepts namely physical, mental, emotional, social, and global.

- The physical concept emphasizes ‘being present and regulated in one's own body’.
- The mental concept involves ‘witnessing thought patterns and developing focusing skills.
- The emotional concept centres on ‘regulating difficult emotions and enhancing positive feelings.

- The social concept integrates 'learned skills into social dynamics, emphasizing compassionate communication and deep listening'.
- The global concept revolves around 'interconnectedness with everything in the world'.

Mindfulness is a secular practice which has originated from Buddhist meditation and is been used as an anxiety reduction approach in different contexts (Kabat-Zinn, 2011). Key components of mindfulness encompass the awareness of bodily sensations, breathing, thoughts actions and feelings, along with the ability to move attention (Hwang & Kearney, 2013). Mindfulness based interventions instruct participants to put their entire focus on the present moment while cultivating an open-minded attitude and non-judgmental approach to identify any negative or positive feelings or emotions they may be experiencing (Ridderinkhof et al., 2018; Segal et al., 2012).

For children, mindfulness has been directly linked to significant improvements in executive function, especially for those with lower level of executive function at the intervention's outset. In the case of children having autism spectrum, mindfulness-based interventions and practices have the potential to enhance social and communication skills by promoting present-moment awareness and increased recognition of emotional states, supporting interpersonal connections (Ridderinkhof et al., 2018; Segal et al., 2012). Growing number of research studies supports the effectiveness of mindfulness-based interventions in reducing depression and anxiety among adults having autism spectrum (Smith, Melanie B. 2021; Conner, et al 2020; Leenders et al 2014). The MY mind program, tailored for children having autism spectrum and also for their parents, has demonstrated positive outcomes in social communication, behavioral and emotional functioning, quality of life, and reduced rumination (Ridderinkhof et al., 2020). Students having specific learning disabilities often experience increased levels of school-related stress, anxiety, and suboptimal social skills when compared to counterparts. Researches in the area suggest that relaxation training along with mindfulness meditation can effectively enhance social skills and reduce anxiety and stress. Beauchemin, Hutchins, and Patterson (2008) conducted the pilot study which intend to examine the impact of a 5-week mindfulness meditation intervention for 34 adolescents with LD on feasibility and attitude with respect to the stress response. Post-intervention surveys revealed overwhelmingly positive attitude and significant improvements in state and trait anxiety response along with improved social skills, and enhanced academic performance. In another study on thirty-four students aged thirteen to eighteen who were diagnosed with learning disabilities, demonstrated significantly decreased anxiety and improved social skills after a five-week mindfulness meditation program (Iberlin & Ruyle, 2017). The study discussed the results of a pilot trial of Learning to BREATHE, which is a mindfulness curriculum designed mainly for adolescents in a classroom context. The program intends to foster emotion regulation skills through mindfulness-based practices. Among 120 senior students from a private girls' school as sample, participants reported increased feelings of calmness, decreased negative affect, relaxation, and self-acceptance relative to

controls. The treatment group exhibited significant improvements in emotion regulation and reductions in tiredness and physical discomfort at the program's conclusion (Solar, 2013). A review of twenty-one studies by Solar (2013) indicates that adolescents with high-incidence disabilities may benefit from mindfulness-based programs or techniques.

Numerous educational programs integrating mindfulness principles, mindfulness-based awareness sessions and social and emotional learning, or comparable frameworks, have been created. Currently, there are several initiatives tailored for young children in school which may be benefitted for children with learning disabilities as well.

Portele, C., Jansen, P. (2023) suggested several Mindfulness-based educational programmes which have significant improvement in the emotional and social competencies of the children including learning disabilities : The Mindfulness in Schools Project (Vickery & Dorjee, 2016), Learning to BREATHE for K–12 (Broderick, 2021), The Inner Kids Program developed by Susan Kaiser Greenland (Flook et al., 2010), The Mindful Education Workbook (Rechtschafen, 2016), The Living Mindfully Programme (Amundsen et al., 2020), A Still Quiet Place (Saltzman, 2014), Paws b (ages 7–11), CalmSpace (Janz et al., 2019), Mindfulness-Oriented Meditation for primary school children (Crescentini et al., 2016), MindUP (Hai et al., 2021) and The Gaia Program (Ghiroldi et al., 2020).

The schools can incorporate mindfulness strategies to help students with LD struggling with social emotional learning problems and improve the overall learning environment. Hawkins and Burke (2021) proposed three tiers for the effective incorporation of mindfulness into the educational system: "(a) being mindful, (b) teaching mindfully, and (c) teaching mindfulness".

The Figure given below shows how the schools can implement mindfulness-based interventions and practices in inclusive settings for children with learning disabilities.

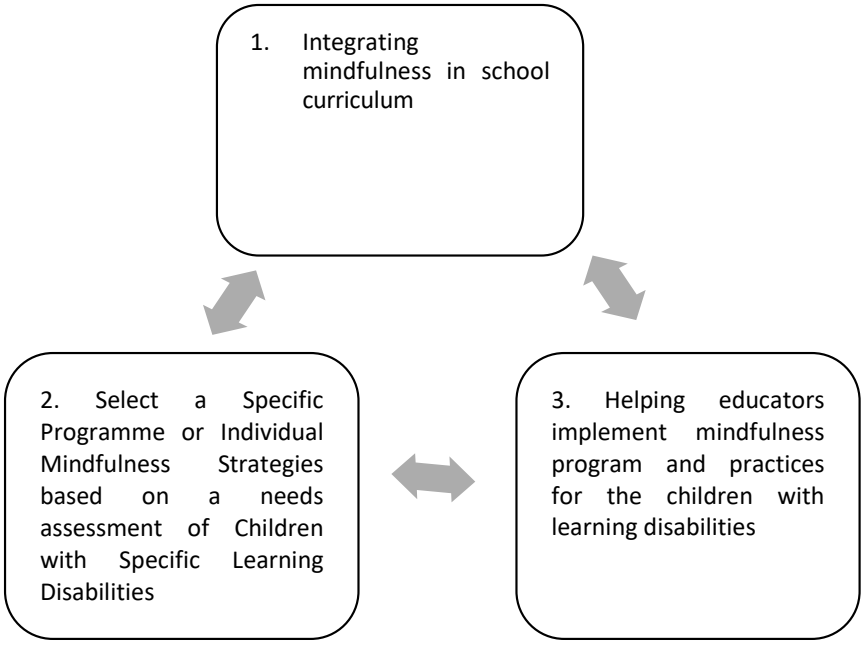

Figure1: Mindfulness-based interventions and practices in inclusive settings for children with learning disabilities

Conclusion

Children with learning disabilities often face social rejection from their peers, and researchers exploring the reasons behind this rejection suggest that underdeveloped social-emotional skills may be a contributing factor. Learning disabilities with nonverbal language disorder (NLD) frequently have low social competence, exhibiting challenges in perceiving social cues such as body language, prosody, and facial emotions. They usually have trouble interpreting social interactions correctly, which makes it difficult for them to decide what behaviors are suitable. Mindfulness, viewed as an innovative approach in line with Social and Emotional Learning (SEL), demonstrates potential effectiveness on the social emotional and academic skills of children with learning disabilities. For children with non-verbal learning disabilities, acquiring the skills to regulate their emotions is crucial for academic and social success both in school and beyond. Mindfulness-based programs offer support to individuals with NVLD in managing their emotions, enhancing overall well-being, and yielding lasting positive effects. Rather than resorting to punitive measures, educators can effectively teach mindfulness practices when working with children and adolescents who have or are at risk for specific learning disabilities. To ensure a lasting and sustainable integration, educators should actively engage in training, not just as participants but also by acquiring mindfulness skills initially to instruct with mindfulness and subsequently to teach mindfulness.

References

Beauchemin, James & Hutchins, Tiffany & Patterson, Fiona. (2008). Mindfulness Meditation May Lessen Anxiety, Promote Social Skills, and Improve Academic Performance Among Adolescents with Learning Disabilities. Complementary Health Practice Review. 13. 34-45. 10.1177/1533210107311624.

Beauchemin, James & Hutchins, Tiffany & Patterson, Fiona. (2008). Mindfulness Meditation May Lessen Anxiety, Promote Social Skills, and Improve Academic Performance Among Adolescents with Learning Disabilities. Complementary Health Practice Review. 13. 34-45. 10.1177/1533210107311624.

Benassi, E., Camia, M., Giovagnoli, S., and Scorza, M. (2022). Impaired school well-being in children with specific learning disorder and its relationship to psychopathological symptoms. Eur. J. Spec. Needs Educ. 37, 74–88. doi: 10.1080/08856257.2020.1842975

Benassi, E., Camia, M., Giovagnoli, S., and Scorza, M. (2022). Impaired school well-being in children with specific learning disorder and its relationship to psychopathological symptoms. Eur. J. Spec. Needs Educ. 37, 74–88. doi: 10.1080/08856257.2020.1842975

CASEL (Collaborative for Academic, Social, and Emotional Learning). (2012). Effective social and emotional learning programs. Chicago, IL: Author. Retrieved from http://static.squarespace.com/ static/513f79f9e4b05ce7b70e9673/t/526a220de4b00a92c90436ba/1382687245993/2013-casel-guide.pdf.

CASEL (Collaborative for Academic, Social, and Emotional Learning). (2012). Effective social and emotional learning programs. Chicago, IL: Author. Retrieved from http://static.squarespace.com/ static/513f79f9e4b05ce7b70e9673/t/526a220de4b00a92c90436ba/1382687245993/2013-casel-guide.pdf.

Collaborative for Academic, Social, and Emotional Learning (2020). What is SEL? 〈https://casel.org/what-is-sel.

Collaborative for Academic, Social, and Emotional Learning (2020). What is SEL? 〈https://casel.org/what-is-sel.

Conner, C.M., Beck, K.B., White, S.W., Mazefsky, C.A. (2020). Mindfulness Therapy for Individuals with Autism Spectrum Disorder. In: Volkmar, F. (eds) Encyclopedia of Autism Spectrum Disorders. Springer, New York, NY. https://doi.org/10.1007/978-1-4614-6435-8_102272-2

Conner, C.M., Beck, K.B., White, S.W., Mazefsky, C.A. (2020). Mindfulness Therapy for Individuals with Autism Spectrum Disorder. In: Volkmar, F. (eds) Encyclopedia of Autism Spectrum Disorders. Springer, New York, NY. https://doi.org/10.1007/978-1-4614-6435-8_102272-2

Dietz, S., and Montague, M. (2006). Attention deficit hyperactivity disorder comorbid with emotional and behavioral disorders and learning disabilities in adolescents. Exceptionality 14, 19–33. doi: 10.1207/s15327035ex1401_3.

Dietz, S., and Montague, M. (2006). Attention deficit hyperactivity disorder comorbid with emotional and behavioral disorders and learning disabilities in adolescents. Exceptionality 14, 19–33. doi: 10.1207/s15327035ex1401_3.

Elksnin, Linda & Elksnin, Nick. (2004). The Social-Emotional Side of Learning Disabilities. Learning Disability Quarterly. 27. 3-8. 10.2307/1593627.

Elksnin, Linda & Elksnin, Nick. (2004). The Social-Emotional Side of Learning Disabilities. Learning Disability Quarterly. 27. 3-8. 10.2307/1593627.

Flook, L., Smalley, S. L., Kitil, M. J., Galla, B. M., Kaiser-Greenland, S., Locke, J., Ishijima, E., & Kasari, C. (2010). Effects of mindful awareness practices on executive functions in elementary school children. Journal of Applied School Psychology, 26(1), 70–95. https://doi.org/10.1080/15377900903379125

Flook, L., Smalley, S. L., Kitil, M. J., Galla, B. M., Kaiser-Greenland, S., Locke, J., Ishijima, E., & Kasari, C. (2010). Effects of mindful awareness practices on executive functions in elementary school children. Journal of Applied School Psychology, 26(1), 70–95. https://doi.org/10.1080/15377900903379125

Gandía-Abellán H, Nieto C, García-Rubio C. (2023). Mindfulness for adults with autism spectrum disorder and intellectual disability: A pilot study. J Intellect Disabil. 27(4):927-943. doi: 10.1177/17446295221107283. Epub 2022 Jun 7. PMID: 35673766.

Gandía-Abellán H, Nieto C, García-Rubio C. (2023). Mindfulness for adults with autism spectrum disorder and intellectual disability: A pilot study. J Intellect Disabil.

27(4):927-943. doi: 10.1177/17446295221107283. Epub 2022 Jun 7. PMID: 35673766.

Hawkins, K., & Burke, A. (2021). The mindful teacher's toolkit: Awareness-based wellbeing in schools. Sage.

Hawkins, K., & Burke, A. (2021). The mindful teacher's toolkit: Awareness-based wellbeing in schools. Sage.

Horbach, J., Mayer, A., Scharke, W., Heim, S., and Günther, T. (2020). Development of behavior problems in children with and without specific learning disorders in reading and spelling from kindergarten to fifth grade. Sci. Stud. Read. 24, 57–71. doi: 10.1080/10888438.2019.1641504.

Horbach, J., Mayer, A., Scharke, W., Heim, S., and Günther, T. (2020). Development of behavior problems in children with and without specific learning disorders in reading and spelling from kindergarten to fifth grade. Sci. Stud. Read. 24, 57–71. doi: 10.1080/10888438.2019.1641504.

Iberlin, J. M., & Ruyle, M. (2017). Cultivating mindfulness in the classroom. Bloomington, IN: Marzano Research. Retrieved from https://digitalcommons.umassglobal.edu/cgi/viewcontent.cgi?article=1442&context=edd_dissertations

Iberlin, J. M., & Ruyle, M. (2017). Cultivating mindfulness in the classroom. Bloomington, IN: Marzano Research. Retrieved from https://digitalcommons.umassglobal.edu/cgi/viewcontent.cgi?article=1442&context=edd_dissertations

Johnson, D. J., & Myklebust, H. R. (1967). Learning disabilities: Educational principles and practices. New York: Grune & Stratton retrieved from https://files.eric.ed.gov/fulltext/EJ712981.pdf.

Johnson, D. J., & Myklebust, H. R. (1967). Learning disabilities: Educational principles and practices. New York: Grune & Stratton retrieved from https://files.eric.ed.gov/fulltext/EJ712981.pdf.

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. Clinical Psychology: Science and Practice, 10(2), 144–156. https:// doi. org/ 10. 1093/ clipsy. bpg016

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. Clinical Psychology: Science and Practice, 10(2), 144–156. https:// doi. org/ 10. 1093/ clipsy. bpg016

Kavale KA, Forness SR. (1996). Social skill deficits and learning disabilities: a meta-analysis. J Learn Disabilities. 29(3), 226-37. doi: 10.1177/002221949602900301. PMID: 8732884.

Kavale KA, Forness SR. (1996). Social skill deficits and learning disabilities: a meta-analysis. J Learn Disabilities. 29(3), 226-37. doi: 10.1177/002221949602900301. PMID: 8732884.

Kavale, K. A., & Mostert, M. P. (2004). Social Skills Interventions for Individuals with Learning Disabilities. Learning Disability Quarterly, 27(1), 31–43. https://doi.org/10.2307/1593630

Kavale, K. A., & Mostert, M. P. (2004). Social Skills Interventions for Individuals with Learning Disabilities. Learning Disability Quarterly, 27(1), 31–43. https://doi.org/10.2307/1593630

Leenders Kiep, Michelle & Spek, Annelies & Hoeben, Lisette. (2014). Mindfulness-Based Therapy in Adults with an Autism Spectrum Disorder: Do Treatment Effects Last?. Mindfulness. 6. 10.1007/s12671-014-0299-x.

Leenders Kiep, Michelle & Spek, Annelies & Hoeben, Lisette. (2014). Mindfulness-Based Therapy in Adults with an Autism Spectrum Disorder: Do Treatment Effects Last?. Mindfulness. 6. 10.1007/s12671-014-0299-x.

Little, S. S. (1993). Nonverbal learning disabilities and socioemotional functioning: A review of recent literature. Journal of Learning Disabilities, 26(10), 653-665.

Little, S. S. (1993). Nonverbal learning disabilities and socioemotional functioning: A review of recent literature. Journal of Learning Disabilities, 26(10), 653-665.

Morris, S. (2002). Promoting social skills among students with nonverbal learning disabilities. Teaching Exceptional Children, 34, 66-7

Morris, S. (2002). Promoting social skills among students with nonverbal learning disabilities. Teaching Exceptional Children, 34, 66-7

Nelson, J. M., and Harwood, H. (2011). Learning disabilities and anxiety: a Meta-analysis. J. Learn. Disabil. 44, 3–17. doi: 10.1177/0022219409359939

Nelson, J. M., and Harwood, H. (2011). Learning disabilities and anxiety: a Meta-analysis. J. Learn. Disabil. 44, 3–17. doi: 10.1177/0022219409359939

Portele, C., Jansen, P. (2023). The Effects of a Mindfulness-Based Training in an Elementary School in Germany. Mindfulness 14, 830–840 . https://doi.org/10.1007/s12671-023-02084-w

Portele, C., Jansen, P. (2023). The Effects of a Mindfulness-Based Training in an Elementary School in Germany. Mindfulness 14, 830–840 . https://doi.org/10.1007/s12671-023-02084-w

Ramaa, S. (2000). Two decades of research on learning disabilities in India. Dyslexia. 6(4):268-83.

Ramaa, S. (2000). Two decades of research on learning disabilities in India. Dyslexia. 6(4):268-83.

Rechtschaffen, D. (2016). The mindful education workbook: Lessons for teaching mindfulness to students. Norton books in education. W.W. Norton & Company. Retrieved from https://pubmed.ncbi.nlm.nih.gov/36778650/

Rechtschaffen, D. (2016). The mindful education workbook: Lessons for teaching mindfulness to students. Norton books in education. W.W. Norton & Company.

Rechtschaffen, D. (2016). The mindful education workbook: Lessons for teaching mindfulness to students. Norton books in education. W.W. Norton & Company. Retrieved from https://pubmed.ncbi.nlm.nih.gov/36778650/

Rechtschaffen, D. (2016). The mindful education workbook: Lessons for teaching mindfulness to students. Norton books in education. W.W. Norton & Company.

Ridderinkhof, A., de Bruin, E. I., van den Driesschen, S., & Bögels, S. M. (2020). Attention in children with autism spectrum disorder and the effects of a mindfulness-based program. Journal of Attention Disorders, 24(5), 681–692. https://doi.org/10.1177/1087054718797428

Ridderinkhof, A., de Bruin, E. I., van den Driesschen, S., & Bögels, S. M. (2020). Attention in children with autism spectrum disorder and the effects of a mindfulness-based program. Journal of Attention Disorders, 24(5), 681–692. https://doi.org/10.1177/1087054718797428

Rourke, B.P., Young, G.C., & Leenaars, A.A. (1989). A childhood learning disability that predisposes those afflicted to adolescent and adult depression and suicide risk. Journal of Learning Disabilities, 22, 169-175. Retrieved from https://repositories.lib.utexas.edu/server/api/core/bitstreams/2b5b2de7-97e2-46dd-b78b-8a351d6994f8/content.

Rourke, B.P., Young, G.C., & Leenaars, A.A. (1989). A childhood learning disability that predisposes those afflicted to adolescent and adult depression and suicide risk. Journal of Learning Disabilities, 22, 169-175. Retrieved from https://repositories.lib.utexas.edu/server/api/core/bitstreams/2b5b2de7-97e2-46dd-b78b-8a351d6994f8/content.

Scaria LM, Bhaskaran D, George B. (2023). Prevalence of Specific Learning Disorders (SLD) Among Children in India: A Systematic Review and Meta-Analysis. Indian Journal of Psychological Medicine. 45(3), 213-219. doi:10.1177/02537176221100128.

Scaria LM, Bhaskaran D, George B. (2023). Prevalence of Specific Learning Disorders (SLD) Among Children in India: A Systematic Review and Meta-Analysis. Indian Journal of Psychological Medicine. 45(3), 213-219. doi:10.1177/02537176221100128.

Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). Mindfulness-based cognitive therapy for depression: A new approach for preventing relapse. New York: Guilford Press. Retrieved from https://www.integrativehealthpartners.org/downloads/Bishop_et_al.pdf.

Segal, Z. V., Williams, J. M. G., & Teasdale, J. D. (2002). Mindfulness-based cognitive therapy for depression: A new approach for preventing relapse. New York: Guilford Press. Retrieved from https://www.integrativehealthpartners.org/downloads/Bishop_et_al.pdf.

Smith, Melanie B. (2021). The Impact of Mindfulness on Mental and Emotional Health, Physical Fitness, and Academic Performance. Online Theses and Dissertations. 759. https://encompass.eku.edu/etd/759.

Smith, Melanie B. (2021). The Impact of Mindfulness on Mental and Emotional Health, Physical Fitness, and Academic Performance. Online Theses and Dissertations. 759. https://encompass.eku.edu/etd/759.

Solar, E. (2013). An Alternative Approach to Behavior Interventions: Mindfulness-Based Stress Reduction. Beyond Behavior, 22(2), 44–48. http://www.jstor.org/stable/24011869

Solar, E. (2013). An Alternative Approach to Behavior Interventions: Mindfulness-Based Stress Reduction. Beyond Behavior, 22(2), 44–48. http://www.jstor.org/stable/24011869

Telzrow, C. F., & Bonar, A. M. (2002). Responding to students with nonverbal learning disabilities. Teaching Exception Children, 34(6), 8 -13.

Telzrow, C. F., & Bonar, A. M. (2002). Responding to students with nonverbal learning disabilities. Teaching Exception Children, 34(6), 8 -13.

Vickery, C. E., & Dorjee, D. (2016). Mindfulness training in primary schools decreases negative affect and increases meta-cognition in children. Frontiers in Psychology, 6, 2025. https://doi.org/10.3389/fpsyg.2015.02025

Vickery, C. E., & Dorjee, D. (2016). Mindfulness training in primary schools decreases negative affect and increases meta-cognition in children. Frontiers in Psychology, 6, 2025. https://doi.org/10.3389/fpsyg.2015.02025

Visser, L., Kalmar, J., Linkersdörfer, J., Görgen, R., Rothe, J., Hasselhorn, M., et al. (2020). Comorbidities between specific learning disorders and psychopathology in elementary school children in Germany. Front. Psych. 11:292. doi: 10.3389/fpsyt.2020.00292

Visser, L., Kalmar, J., Linkersdörfer, J., Görgen, R., Rothe, J., Hasselhorn, M., et al. (2020). Comorbidities between specific learning disorders and psychopathology in elementary school children in Germany. Front. Psych. 11:292. doi: 10.3389/fpsyt.2020.00292

Wardle, J., & Weinhardt, M. (2013). The everything parents guide to raising mindful children: giving parents the tools to teach emotional awareness, coping skills, and impulse control in children. Avon, MA: Adams Media Corporation retrieved from https://core.ac.uk/download/pdf/230812248.pdf.

Wardle, J., & Weinhardt, M. (2013). The everything parents guide to raising mindful children: giving parents the tools to teach emotional awareness, coping skills, and impulse control in children. Avon, MA: Adams Media Corporation retrieved from https://core.ac.uk/download/pdf/230812248.pdf.

Willcutt, E. G., and Pennington, B. F. (2000). Psychiatric comorbidity in children and adolescents with reading disability. J. Child Psychol. Psychiatry 41, 1039–1048. doi: 10.1111/1469-7610.00691

Willcutt, E. G., and Pennington, B. F. (2000). Psychiatric comorbidity in children and adolescents with reading disability. J. Child Psychol. Psychiatry 41, 1039–1048. doi: 10.1111/1469-7610.00691

Zylowska, L., Smalley, S. L., & Schwartz, J. M. (2009). Mindful awareness and ADHD. Clinical Handbook of Mindfulness, (pp 319-228). Springer NY. Retrieved from https://phhp-marsiske-a2.sites.medinfo.ufl.edu/files/2018/06/Jacqueline-E-Maye-Dissertation-6-6-18.pdf.

Zylowska, L., Smalley, S. L., & Schwartz, J. M. (2009). Mindful awareness and ADHD. Clinical Handbook of Mindfulness, (pp 319-228). Springer NY. Retrieved from https://phhp-marsiske-a2.sites.medinfo.ufl.edu/files/2018/06/Jacqueline-E-Maye-Dissertation-6-6-18.pdf.

Benefits of Yoga and Yoga Therapy on Children with Dyslexia

Anju Bala[1] & Pettala Ramakrishna[2]

Abstract

The learning issue known as dyslexia, or reading disability, is characterized by difficulties reading because of problems with language processing in certain parts of the brain. In addition to other interventions, the majority of dyslexic children can thrive in school with tutoring or specialized schooling. In India, 14 percent of school-aged children have Dyslexia. The current study aims to investigate various yoga asanas and yoga therapy for the benefit of children with Dyslexia among middle school students. The study mainly focused on students who have been diagnosed with Specific Learning Disability (SLD). The study sample involves 30 teachers, consisting of educators and yoga instructors, who deal with middle school students in Delhi and Haryana. The present study was designed using a descriptive survey method. In order to collect the data, the researcher developed a questionnaire in consultation with experts in the field of SLD and yoga. The data collected from the teachers were analysed using both quantitative and qualitative techniques. The result of the present study reveals that various yoga asanas and yoga therapy benefits children with Dyslexia. So, it may be recommended to practice certain yoga asanas and make children part of yoga therapy in order to reduce secondary problems that unfold due to Dyslexia.

Keywords*:* Dyslexia, Intervention, Yoga Asanas, Yoga Therapy, Middle School Students.

Introduction

According to the WHO (2011), about 15% of people on the planet suffer from one or more forms of disability, such as physical, mental, developmental, sensory, or psychosocial. While a small percentage of people develop disabilities as adults, the majority are either born with a disability or develop one as children. A disability affects 150 million children under the age of 18, according to estimates from the United Nations Children's Fund (UNICEF). According to UNICEF (2005), these kids frequently need special education services in schools. Among these disabilities, learning disability is

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one kind. A student's capacity to read, write, spell, reason, and organize material presented in conventional methods is affected by this neurological illness (Learning Disabilities Online, 2017). Students with learning difficulties are capable of being highly successful learners if they are provided with the right educational resources. One of the six Indian philosophical schools that aid in the manifestation of each person's potential is yoga. With its potential for preventive, curative, and rehabilitative care, yoga is a huge blessing to civilized man. It is a spiritual science that focuses on the integration of all facets of the human being, including the physical, mental, and spiritual.

Yoga is a traditional, well-researched, and vetted art form and therapeutic science that can positively impact the general welfare and happiness of all people, even those who are disabled. (Explanations) Exercises (Asanas): The movement involved in yoga poses is what people see most. Breathing (Pranayama) is one of the most crucial yogi principles. Teach your child to follow your motions and to stop when there is pain or discomfort. The backbone of yoga. Throughout the session, you should teach your child to pay attention to their breathing and make an effort to maintain this connection. Dharana, or concentration, Dhyana, or meditation, and Pratyahara, or relaxation: Children's minds are more prone to wander than those of adults, but if you encourage them to keep their attention on the here and now, they will be able to accept the relaxation. Union (Samadhi) & Discipline (Yamas): After you have finished your yoga practice, help your child understand how yoga and meditation can improve other areas of their lives. After a yoga session, the practice continues. Learning, according to Ayurveda, is the outcome of a series of intricate interactions between the organs, Mana (psyche), Atma, and Buddhi (intellect). Above all, Tridosha (vata, pitta, and kapha) and Triguna (Sattva, Raja, and Tama) regulate the unique coordination and balance of the functioning of Indriyas (cognitive and motor organs), Indriyartha (feel these variables). If this 'Tridosha' and 'Triguna' are disturbed in any way, Mana, Buddhi, and Indriya will not work as they should, which can cause dyslexia or trouble learning. Ayurvedic medicines can help treat dyslexia by keeping the 'Tridosha and Triguna' in balance and giving kids Medhya (drugs that boost intelligence) to help them learn better.

Dyslexia Disorder

A learning disability is dyslexia. This neurological condition is typified by reading difficulties, spelling mistakes, and accurate and fluent word reading and spelling. Children with dyslexia have normal IQ and vision. It might take years for dyslexia to be identified and acknowledged until adulthood. It is typically detected after the age of three. A kid's family and teachers should be informed of the diagnosis as soon as possible after the youngster receives a dyslexia diagnosis. Children with dyslexia require a different approach to reading instruction than their non-dyslexic peers. Many kids who are diagnosed with dyslexia later struggle academically year after year as they attempt to learn to read like everyone else. After being diagnosed with dyslexia, individuals will eventually need to retrain their reading skills. The child's spelling and reading skills may be impacted by one of the various forms of dyslexia, often known as learning

impairments. Based on the sort of issue affecting the brain or central nervous system, the types are distinguished.

Yoga, Yoga Therapy, and Dyslexic Children

Yoga is beneficial to a child's growth in every way. Yoga presents a viable therapy option for children with Dyslexia. Exercises involving breathing stimulate the central nervous system and strengthen the immune system. Yoga therapy is a body-mind discipline that emphasizes mental, emotional, and physical well-being. Yoga therapy is a way to provide you with the tools you need to use yoga to enhance your health and well-being. Learning disabilities such as Dyslexia essentially require us to become more aware of our surroundings and to use all of our senses. We can stimulate the brain by pressing certain marma spots on the face. About 10 to 15 percent of school-age youngsters have Dyslexia. Boys make up about four out of every five children who have Dyslexia. Dyslexia is the most prevalent kind of learning disability, affecting people of all races equally.

Objectives of Study:

- To find out the benefits of Yoga on Dyslexic students
- To find out the benefits of Yoga therapy on Dyslexic students

Hypothesis of the Study:

HO I. There will be no significant difference in the mean scores of the perception on the yoga and yoga therapy practices between male and female teachers towards dyslexic students.

HO II. There will be no significant difference in the mean scores of the perception on the yoga and yoga therapy practices between general and special education teachers.

Review of Literature:

Ricardo, Zohar, and Friedmann (2016). English developmental letter position dyslexia's site of impairment and how spatial attention effect letter transpositions are examined in the study. They found that attentional manipulation did not affect letter transpositions. It supports the idea that LPD may be caused by a letter position encoding problem rather than an attention deficiency.

Iran, Shavan and Sadeghian (2023). Researcher found that yoga therapy can help students with dyscalculia experience fewer arithmetic learning difficulties.

Sakthivel R. et al.(2023) Study revealed no difference in baseline CTRS-R scores for Inattention, Hyperactivity, Impulsivity, Psychological difficulties, Peer issues, and Personality issues by gender, medium of instruction, order of birth, parent education, or school type. The novel integrated intervention program reduced hyperactivity, peer, personality, academic, and LD symptoms more than the CTRS-R pretest-posttest. This revolutionary Yoga-Based Integrated Multi Training Intervention greatly reduced ADHD symptoms, increased academic achievement, and enhanced peer relationships.

Methodology

Research Type: This study employed descriptive survey research.

Sample and Sampling Techniques: The sample of this study consisted of 52 general educators and special educators working in different schools. The sample of the study was selected via the convenience sampling method. Out of 52 teachers, male teachers numbered 23 while female teachers numbered 29. General educators numbered 13, and special educators numbered 39.

Tools used for the study: The data collection tool had developed by the researcher. A Questionnaire with 15 items was employed to find out the benefits of yoga and yoga therapy on children with Dyslexia. Each item was assessed on a five-point Likert scale (1 for "strongly disagree" to 5 for "strongly agree").

Data Collection & Administration

The questionnaire was distributed in the form of Google Forms through email and WhatsApp as the questionnaire was self-paced without time restriction; in total, 52 responses were received by Google Forms.

DATA ANALYSIS: The researcher was analyzed via the SPSS 20.0 program. First, the researcher analyzed participants' general characteristics using “frequency analysis and descriptive statistics”. Next, the researcher using t-tests.

Table 1- Descriptive statistics of yoga and yoga therapy

Sr. Number		Yoga & Yoga Therapy	
Demographic Variable		MEAN	SD
Gender	N		
Male	**23**	**56.57**	**13.05**
Female	**29**	**56.90**	**10.75**
Total	52		
General & Special Educators	N		
G. Educators	**13**	**46.46**	**8.41**
S. Educators	**39**	**60.18**	**10.64**
Total	52		

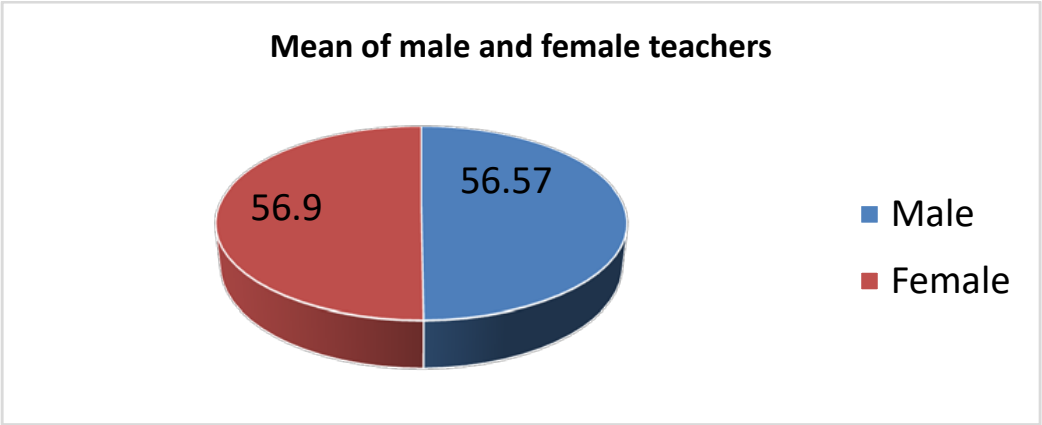
Result and Discussion

The hypothesis was to study the mean scores of yoga and yoga therapy on dyslexia disorder students in terms of gender, types of educators (general educators and special educators), and types of yoga (yoga and yoga therapy). The data were analyzed with the help of a *t-test* and the results are given below.

TABLE 2- "A COMPARISON OF PERCEPTION ON YOGA AND YOGA THERAPY PRACTICES BETWEEN MALE AND FEMALE TEACHERS"

Gender	Mean	S.D	*df*	N	*t-value*	Sig.
MALE	56.57	13.05	50	23	-.100	
FEMALE	56.90	10.75		29		0.005**

- The *t-value* is shown in Table 2. -.100, which is less than the table value at 0.05 (1.98) level of significance with df =50. It shows that the mean scores of the perception on the yoga and yoga therapy practices between male and female teachers towards dyslexia disorder students did not differ significantly. Thus, the null hypothesis is accepted.



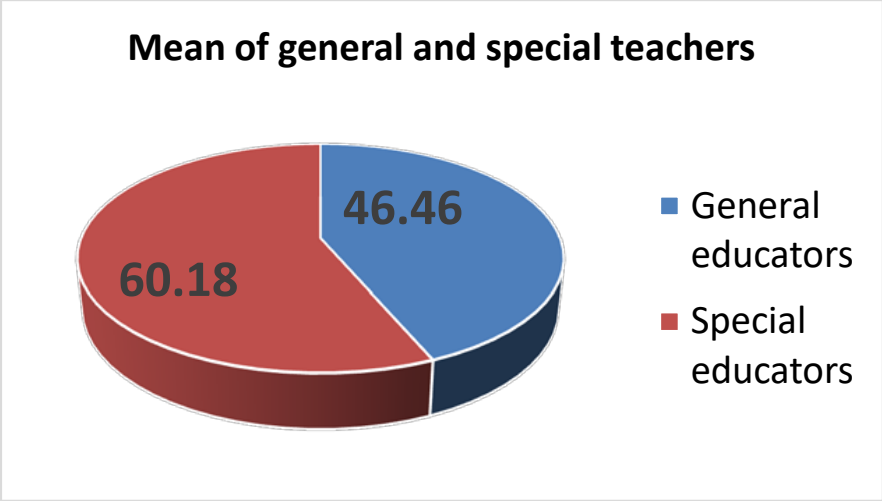
Mean scores of male and female teachers

Further, the mean score of the perception of male teachers towards yoga and yoga therapy on dyslexia disorder students is 56.57, which is significantly equal to those of female teachers, whose mean scores of yoga and yoga therapy on dyslexia disorder students is 56.90. It may, therefore, be said that male & female teachers were found to believe to the same level.

TABLE 3- A COMPARISON OF PERCEPTION OF YOGA AND YOGA THERAPY PRACTICES BETWEEN GENERAL TEACHER AND SPECIAL TEACHER

Types of educators	Mean	S.D	*df*	N	*t-value*	Sig.
Gen. Teachers	46.46	8.41	**50**	13	**-4.23**	
Spec. Teachers	60.18	10.64		39		0.005**

- From Table 3, it can be seen that the *t-value* of -4.23 is significant at 0.005 level with df = 50. It shows that the mean scores of the perception of general teachers and special teachers of yoga and yoga therapy on dyslexia disorder students differ significantly. Thus, the null hypothesis is rejected. Further the mean scores of the perception of general teachers towards yoga and yoga therapy on dyslexic students are 46.46 which is significantly lower than those of special teachers whose mean scores of yoga and yoga therapy on dyslexia disorder students is 60.18.



Mean scores of general teachers & special teachers:

Significant differences were observed in the mean scores of general and special teachers regarding yoga and yoga therapy for dyslexic students.

Conclusion:

Yoga is an incredibly healthful kind of exercise. Yoga has several advantages, such as lowering stress and anxiety levels, lowering the chance of developing certain chronic conditions, and even improving balance and endurance. Focus, word recognition, and spatial awareness are all enhanced. Neurological problems are relieved by yoga and yoga treatment. Many people, including those with Dyslexia, ADHD, ADD, and other learning difficulties, find great benefits from yoga. It may aid in their mental clarity and relaxation. With the integration of sense and function of the central auditory nerve, yoga treatment enhances motor imitations and sensory integration, enabling people with behavioral, cognitive, and sensory difficulties to make meaningful responses.

In this study, the researcher formulated two null hypotheses and tested them through SPSS, in which one null hypothesis was rejected, and one hypothesis was accepted. In this study, the researcher found that gender was not significant, which means the researcher did not see any difference in the perception on the yoga and yoga therapy practices between male and female teachers towards dyslexia disorder students, on the other hand, this contrasts with several studies that indicate that found differ

significantly on the basis of gender. Second hypothesis is rejected which means researcher had found difference in the perception on the yoga and yoga therapy practices between general and special teachers towards dyslexia disorder students. Special teachers have a higher perception than general teachers of yoga and yoga therapy practices on dyslexia disorder students. There are several advantages to incorporating yoga into a student's life that promote their overall growth. Yoga helps students succeed intellectually, emotionally, and physically by promoting emotional well-being, enhancing concentration, controlling stress, and developing self-discipline. Therefore, let's inspire students to embrace the life-changing practice of yoga and see how it helps them on their path to a happy, balanced existence.

References

Brookes, R. L., Tinkler, S., Nicolson, R. I., & Fawcett, A. J. (2010). Striking the right balance: Motor difficulties in children and adults with Dyslexia. Dyslexia, 16(4), 358-373.

Cornelissen, P., Richardson, A., Mason, A., & Fowler, S. (1995). Contrast sensitivity and coherent motion detection measured at photopic luminance levels in dyslexics and controls. Vision Research, 35(10), 1483-1494.

Dahle, A., Knivsberg, A., &Andreassen, A. (2011). Coexisting problem behaviour in severe Dyslexia. Journal of Research in Special Educational Needs, 11(3), 162-170.

Donfrancesco, R., Mugnaini, D., &Dell'uomo, A. (2005). Cognitive impulsivity in specific learning disabilities. European Child & Adolescent Psychiatry, 14(5), 270-275.

Germanò, E., Gagliano, A., &Curatolo, P. (2010). Comorbidity of ADHD and Dyslexia. Developmental Neuropsychology, 35(5), 475-493.

Helland, T. (2007). Dyslexia at a behavioural and a cognitive level. Dyslexia: An International Journal of Research and Practice, 13(1), 25-41.

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.

Kayal, D. R. (n.d.). *Sri Aurobindo and Integral Yoga: A Review*.

Komala, D. P. T. (2020). *TITLE: EFFECT OF YOGIC PRACTICES WITH AND WITHOUT MANTRA CHANTING ON SELECTED RISK FACTORS AMONG DSYLEXIA AFFECTED URBAN SCHOOL BOYS*.

Smail, L., &Chaouki, M. (2018). *DEVELOPMENT AND VALIDATION OF A TEACHER RATING SCALE PRIMARY SCHOOL CHILDREN WITH READING DISABILITY*.

Tarrasch, Ricardo, Zohar Berman, and Naama Friedmann. “Mindful Reading: Mindfulness Meditation Helps Keep Readers with Dyslexia and ADHD on the Lexical Track.” *Frontiers in Psychology* 7 (May 10, 2016). https://doi.org/10.3389/fpsyg.2016.00578.

Tehran, Iran., Ali Jalilishi Shavan, Nasrin Sadeghian, and Department of General Psychology, Payam Noor University, Tabriz, Iran. “The Effect of Yoga Therapy As a Supplement in the Management of Students With Dyscalculia: A Clinical Trail Study.”

Physical Treatments - Specific Physical Therapy Journal 13, no. 2 (April 1, 2023): 105–12. https://doi.org/10.32598/ptj.13.2.546.2.

https://www.google.co.in/books/edition/Dyslexia_and_Alternative_Therapies/bIoHj16MeLsC?hl=en&gbpv=0

https://www.indianjournals.com/ijor.aspx?target=ijor:ijrss&volume=7&issue=3&article=021

https://www.ingentaconnect.com/content/ben/aps/2017/00000007/00000001/art00006

Unlocking the Potential of Brain Plasticity: Implications for Learning, Rehabilitation, and Cognitive Enhancement for Children with Learning Disability

Shabia Sharif[1] & Eram Nasir[2]

Abstract

The brain's fundamental capacity to modify and reorganize in response to experiences, learning, and adjustments in the environment is known as neuroplasticity, or brain plasticity. The processes governing brain plasticity, such as synaptic plasticity, structural plasticity, and functional reorganization, are examined in this study article. Researcher examine how brain plasticity affects learning Through a comprehensive review of recent studies and advances in neuroscience, elucidate the factors that influence brain plasticity, such as age, genetics, and environmental enrichment. Researcher clarify the variables that affect brain plasticity, such as age, heredity, and environmental enrichment, a thorough analysis of current research and developments in neuroscience also go over the consequences of comprehending brain plasticity for the creation of new therapeutic techniques, clinical interventions, and educational programs. Researcher open the door to novel approaches to utilizing the brain's adaptive potential to improve our mental abilities, resilience, and overall well-being by solving the problems surrounding brain plasticity.

Keywords*:* Brain Plasticity, Neuroplasticity, Synaptic Plasticity, Structural Plasticity, Learning, Memory, Rehabilitation, Cognitive Enhancement

Objective: To investigate the current understanding of brain plasticity mechanisms in children with learning disabilities.

Introduction:

The human brain is a remarkable organ endowed with the capacity for change and adaptation throughout life. This phenomenon, known as brain plasticity or neuroplasticity, much beyond the first ten years of life, the growing brain is still "under

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construction," which contributes to its plasticity. The word "plasticity," which comes from the Greek word "plaistikos," which means "to form" represents the brain's ability for retaining information, recalling information, and forgetting as well as for restructuring and recovering from damage the ability to change or adapt in response to experience has captivated researchers and neuroscientists. Brain plasticity refers to the brain's ability to change structure and function. Brain plasticity encompasses a wide range of processes, from the formation of new neural connections to the reorganization of existing circuits, that underlie learning, memory, and cognitive function. Understanding the mechanisms and principles of brain plasticity has profound implications for education, rehabilitation, and cognitive enhancement, offering new insights into how we learn, recover from brain injuries, and optimize brain function.

Mechanisms of Brain Plasticity

• Synaptic Plasticity

The term "synaptic plasticity" describes how synapses, or the connections between neurons, can become stronger or weaker over time in response to changes in activity. Because information can be received and remembered through changes in the strength of synaptic connections, learning and memory processes are supported by synaptic plasticity.

• Structural Plasticity

This refers to modifications in the physical makeup of neurons and the connections between them. It encompasses procedures like axonal sprouting, dendritic branching, and the creation of new synapses. Because of structural plasticity, the brain can heal from injuries, pick up new abilities, and adjust to new experiences by rebuilding neuronal circuits.

• Functional Reorganization

The term "functional reorganization" describes the brain's capacity to reallocate functions among different parts in response to modifications in input or injury to certain areas. For instance, when one region of the brain is injured, other parts of the brain may take over to make up for the loss. Despite alterations in the structure or activity of the brain, cognitive and motor abilities can be maintained through functional reorganization.

Factor Influencing Brain Plasticity

1. Age

The term "brain plasticity" describes the brain's capacity to rearrange itself throughout life by establishing new neural connections. Despite to popular belief, which holds that brain plasticity decreases with age, new study indicates that brain plasticity persists to some extent throughout life. However, the degree of flexibility may change depending on a person's life stage. Young children's brains, for example, are highly plastic, facilitating quick learning and development, whereas elderly individuals' brains may be

less flexible. On the other hand, regardless of age, mental stimulation activities and the acquisition of new abilities can support brain plasticity.

2. **Genetics**

Genetic factors have a considerable impact on an individual's baseline level of brain plasticity. A person's ability to learn and build memories can be influenced by specific genes that are linked to increased or decreased plasticity. Variations in genes can further shape an individual's brain plasticity by influencing how they respond to events and surroundings.

3. Environmental Enrichment

Brain plasticity is significantly influenced by factors related to the environment. Neural plasticity can be strengthened through exposure to enriched environments which include a variety of sensory, cognitive, and social stimuli. Neurons develop new connections and synaptic plasticity is facilitated by enriching experiences including acquiring new skills, exercising, interacting with people, and being exposed to new stimuli. On the other hand, depressed and unstimulating surroundings might limit brain plasticity and deteriorate cognitive abilities.

Brain Plasticity in Optimizing Learning Experiences with Early Interventions:

Connection is the key to learning. A child's brain is unfinished at birth. It grows as a result of their experiences of the world through their senses of taste, smell, hearing, touching, and sight. Children' experiences have a lasting impact on their capacity for learning and emotional control. The brain can be influenced and lasting adverse consequences are more likely to occur when a baby's environment lack possibilities for adequate teaching and learning. As a newborn experience something or learns something for the first time, a strong neural connection is formed; on the other hand, if we provide plenty of learning opportunities, we can foster brain development. The bond is reinforced and renewed if this experience is repeated.

Connections are broken if the experience is not repeated. Children who suffer from developmental delays frequently have "unhelpful" neural wiring in their brains, which makes it difficult for them to communicate, interact with others, and perform other tasks. It becomes more difficult and requires time to adjust these "unhelpful" connections. Early childhood is the ideal time for intervention since at this developmental stage, neuronal connections are 50% more than in the adult brain. The brain begins to reduce these crucial brain connections and underutilized neurons when a kid enters puberty, marking the start of another pruning phase. This knowledge of the brain's plasticity is especially pertinent for kids with all kinds of learning disabilities and developmental disorders because it highlights the importance of early intervention of the right kind and quantity. When we accurately diagnose a child's skill deficiencies and develop a program that addresses strengthens the specific weak areas of the brain, we may exercise and strengthen those brain regions to promote language development and social skill development, among other things. Various early interventions, such as art

therapy, music therapy, breathing exercises, outdoor nature walks, mindfulness meditation, art therapy, and balancing beam hopping, can increase dexterity and enhance overall well-being.

Implications for Education and Clinical Interventions ➢Educational Strategies

Using a variety of techniques to maximize learning outcomes is part of utilizing brain plasticity in educational contexts. Enhancing connections between neurons by simultaneously activating several senses, multi-sensory learning combines tactile materials, aural signals, and pictures. Utilizing the brain's ability to adjust to each specific learner, personalized learning strategies customize training to each student's interests, shortcomings, and skills. In contrast to passive learning methods, active learning methodologies emphasize experiential, hands-on learning that promotes brain activation and retention. Students are encouraged to think critically and develop their networks of neurons through problem-based learning, which connects them with real-world issues. Furthermore, incorporating stress management and mindfulness exercises into the curriculum improves mental wellness and brain function, which prepares children for learning. Also, adaptive platforms that serve to a range of learning styles and speeds through technology integration in education utilize the brain's capacity to reorganize itself in response to new stimuli, thereby enhancing the learning process

➢Neurorehabilitation Approaches

Many strategies in neurorehabilitation take benefit of brain plasticity to speed up healing from neurological disorders or injuries. Through the creation of rehabilitation exercises that specifically target neural pathways in need of repair, task-specific training promotes neuronal transforming and functional recovery through repeated practice.

The goal of Constraint-Induced Movement Therapy (CIMT) is to induce neuronal plasticity and functional restoration following a stroke or other injury by limiting the use of the unaffected part of the body and stimulating intense usage of the part that is affected. In order to promote brain reconstruction and functional recovery in a controlled context, virtual reality (VR) rehabilitation uses interactive settings to offer intense and stimulating experiences. Using the knowledge of neurological specialists, physiotherapists, occupational therapists, psychologists, and educators, collaborative approaches integrating multidisciplinary teams improve outcomes and customize interventions to each individual need.

Conclusion

According to research on brain plasticity, the brain is not a static structure but rather has the amazing capacity to change and restructure during the course of a lifetime. Researchers are able to create focused therapies for education, rehabilitation, and cognitive enhancement by understanding the mechanisms underlying this plasticity, such as the connection strengthening, growth of neurons, and cognitive remapping. With this knowledge, individualized learning strategies that maximize students' learning outcomes may be developed for each student, taking into account their strengths as

well as their weaknesses. Understanding brain plasticity helps practitioners provide therapies that take use of the brain's capacity to heal itself by rewiring damaged areas to compensate for the damage. Also, knowledge of brain plasticity creates opportunities for improving cognitive capacities through approaches like brain stimulation and cognitive rehabilitation. Ultimately, we have the chance to improve our cognitive abilities, adaptability, and general well-being by realizing the full potential of the human brain through the study of plasticity. With this knowledge, we can better adjust to new situations, preserve our cognitive health throughout time, and foster psychological toughness in the face of challenges.

References:

Johnston, M. V. (2004). Clinical disorders of brain plasticity. *Brain and Development*, *26*(2), 73-80.

Kolb, B., & Whishaw, I. Q. (1998). Brain plasticity and behavior. Annual review of psychology, 49(1), 43-64.

Pearson-Fuhrhop, K. M., Kleim, J. A., & Cramer, S. C. (2009). Brain plasticity and genetic factors. Topics in stroke rehabilitation, 16(4), 282-299.

https://learnbehavioral.com/blog/brain-plasticity

https://youtu.be/i-FzGzZjISI?si=Py9OxWR6DP2VSRpa

Cognitive Reshaping: Neurocognitive Interventions for Dyslexia and Reading Improvement

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Abstract

The neurodevelopmental disorder dyslexia affects reading comprehension and acquisition. It is characterized by issues with working memory, phonological processing, and quick naming. In order to improve reading, neurocognitive therapies provide focused methods to modify these fundamental cognitive processes. Reading and language processing are linked to a number of brain regions, most of which are found in the left hemisphere. These include Wernicke's area, which is essential for language comprehension, the angular gyrus involved in semantic processing, and Broca's region, which is in charge of producing speech. Furthermore, the temporal lobe is engaged in verbal memory and auditory processing, and the frontal lobe is important in executive processes including working memory and attention. These interventions cover a range of strategies, such as multimodal learning methods, working memory exercises, and phonological awareness training. Creating successful therapies for dyslexia requires an understanding of the intricate interactions between brain activity and cognitive skills. This research attempts to add to a better understanding of dyslexia and inform the design of tailored treatments to support people with dyslexia on their path to literacy and academic achievement by looking at the most recent advancements in neurocognitive therapy.

Keywords: Dyslexia, Neurocognitive, Interventions, Brain Functions.

Introduction

Dyslexia, a neuro developmental disorder affecting reading acquisition and comprehension, presents significant challenges for individuals in educational, professional, and personal domains. The definition of dyslexia that is most frequently stated states that the disorder is characterized by difficulties learning to read even with traditional instruction, normal IQ, and social and cultural opportunities. It depends on basic cognitive impairments, which are often caused by constitutional issues (Yang et al., 2017). "Dyslexia is a persistent and unpredictable difficulty with developing age- and

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experience-appropriate word reading skills," according to a more current definition that takes educational and psychological concepts into account (Parrila & Protopapas, 2017). Dyslexia has been linked to both neurological and developmental factors.

Despite its prevalence and impact, dyslexia remains a complex condition with diverse manifestations and underlying cognitive mechanisms. The development of speech and language is a multifactorial process involving several brain regions as well as cognitive, motor, and sensory inputs. Numerous studies have demonstrated that the frontoparietal control network (FPN) is in charge of supporting neuronal health in particular brain regions, including those related to reading ability (Aboud et al., 2018).

In the past few years, researchers have been looking into ways to help dyslexic people improve their reading. They've found that using methods that work on both the brain and thinking skills can be really helpful. These methods focus on improving certain parts of thinking, like understanding sounds in words, remembering things, and saying things quickly. By working on these specific skills, dyslexic people can get better at reading.

The purpose of this study is to offer the most recent scientific findings that identify various neurocognitive interventions that can enhance brain function and help children with dyslexia and reading challenges achieve long-term reading improvement.

Rationale

The study holds importance due to its investigation of the efficacy and underlying processes of neurocognitive therapies in addressing dyslexia and enhancing reading proficiency. Through an analysis of recent advancements and knowledge in this domain, the study seeks to enhance comprehension of dyslexia and provide guidance for creating more efficient interventions to assist individuals with dyslexia in achieving the goals of literacy and academic achievement. The study seeks to enhance dyslexia research and practice by identifying successful strategies and potential intervention approaches, with the ultimate goal of enhancing results for individuals with dyslexia. This study seeks to offer significant insights into the many regions of the brain involved in language and the various neurocognitive therapies investigated by researchers in the medical profession. It achieves this by combining research findings and best practices from multiple research papers.

Brain Function and Language

The act of reading is a multifaceted process, involving various stages and corresponding brain regions. Initially, the brain must recognize text, a function facilitated by the optic nerve and other nerve pathways transmitting visual signals to the visual cortex. Following this, the brain proceeds to interpret the text through a network of regions including Broca’s area, the angular gyrus, insular cortex, basal ganglia, cerebellum, and Wernicke’s area. Predominantly, language and reading-related functions are localized in the left hemisphere of the brain. The frontal lobe, the brain's largest lobe, governs numerous cognitive processes such as speech, emotion regulation, planning, and consciousness. The parietal lobe is associated with processing language inputs and

integrating them into memory for contextual understanding. Meanwhile, the occipital lobe plays a crucial role in identifying letters, while the temporal lobe is instrumental in verbal memory.

Table 1. shows the various brain areas associated language

Broca's Area	Broca's area is located in the frontal lobe and plays a significant role in language formulation and manipulation of language and speech (Joseph et al., 2001) Broca's area is proposed to be involved in synaptic processing (Rogalsky, 2008) (Grodzinsky, 2000) Studies have also implicated Broca's area with verbal working memory and sentence comprehension (Martin et al., 2016).
Angular Gyrus (AG)	Friston, 2010, proposed a framework in which AG stood as an integration step between transforming sensory inputs (bottom-up processing) to cognitive perceptions (top-down processing) (Friston, 2010). This integration has a significant impact in the comprehension and reasoning of a variety of fundamental processes such as semantic access, fact retrieval, categorization of events and shifting attention to relevant details/events.
Insular Cortex	The insula cortex is part of the cerebral cortex. A meta-analysis of fMRI and PET by Eickhoff et al., 2009, showed that the insular may act as a relay between cognitive-related tasks of language and motor-related aspects for vocalization in basal ganglia and cerebellum (Oh et al., 2014) (Eickhoff et al., 2009).
Basal Ganglia	Basal ganglia (BG) are a group of subcortical structures (nuclei) in the cerebral hemispheres. Evidence shows that the BG is involved in executive functioning (EF) (Tekin & Cummings, 2002). Several studies have indicated the role of basal ganglia in several reading and language tasks (Booth et al., 2007) Ullman, 2001, proposed a model in which the basal ganglia are part of a cognitive system that is implicated in the transformation of phonemes into words (Ullman, 2001).
Cerebellum	Another study by Booth et al., 2007, showed that the cerebellum had reciprocal involvement with brain regions associated with phonological processing (Booth et al., 2007).
Wernicke's area	Wernicke's area is located on the left side in the temporal lobe and has proven to play a significant role in language development, processing and understanding as well as reading and speech comprehension (Joseph et al., 2001). It works in collaboration with AG, insular cortex and basal ganglia for word processing in order to comprehend context and meaning (Ardila et al., 2016). Damage to this particular area can lead to impairment of language development and/or usage (Binder, 2015).

Significance of neurocognitive interventions

Fundamentally, neurocognitive therapies offer a thorough and focused approach to assist those who are dyslexic in learning essential reading skills and overcoming dyslexia-related challenges. Neurocognitive therapies offer tailored approaches to address the particular cognitive challenges dyslexic youngsters confront. This is how they contribute:

Focused Approach: These interventions concentrate on enhancing the core cognitive functions related to reading difficulties, like phonological awareness, working memory,

and rapid naming. By honing in on these areas, dyslexic children can build the fundamental skills necessary for reading.

Personalized Assistance: Tailored to each child's strengths and weaknesses, these interventions address individual cognitive deficits affecting reading. This personalized approach ensures that interventions meet the unique needs of every child.

Supported by Research: Numerous neurocognitive therapies have strong research support, demonstrating their efficacy in enhancing dyslexic children's reading abilities. The efficacy of these therapies is further enhanced by their based on research basis.

Engagement through Multisensory Learning: Neurocognitive interventions often employ multisensory learning methods, involving auditory, visual, and kinesthetic pathways. This multisensory approach enhances learning and retention, aiding dyslexic children.

Structured Progression: Interventions follow structured and systematic guidelines, offering clear pathways for skill development. This structured approach helps dyslexic children gradually build essential reading skills.

Long-Term Advantages: Beyond short-term reading improvement, neurocognitive interventions foster long-term benefits by bolstering cognitive processes vital for academic success. Strengthening these foundational skills equips dyslexic children to surmount reading challenges and reach their full potential.

Enhancing Learning in Dyslexic Children through Neurocognitive Interventions

Cortical Connections

People have the ability to control the health of their brain systems through cortical connections. Consequently, high levels of intervention could enhance the executive skills thought to be essential for learning in people with reading difficulties (Blair & Razza, 2007) & (Diamond, 2013). Because they create alternate pathways for the reading systems, cognitive control systems are essential for their involvement in resilient learning because they enhance and promote connections on vital control networks. As a result, reading and executive function therapies may be beneficial for learners (Wanzek et al., 2009).

Visual Perceptual Training

Research demonstrates that visual perceptual training (VPT) is another type of training that has successfully enhanced dyslexic children's reading comprehension (Peters et al., 2019). Compared to established treatments, there are significant improvements in fluency even though it does not include phonological, orthographic, or reading interventions. This is because it develops automatization of visual, perceptual, and attentional processing (Das-Smaal et al., 1996), global visual processing (Franceschini et al., 2017 & Judica et al., 2002), rapid endogenous visuospatial orienting, and inhibitory-controlled attentional focus (Huber et al., 2018). The letter units, words, and sentences in reading acceleration programs are computer-adapted to enhance working memory,

attention, and executive function. However, the lack of specific phonological or orthographic instruction leaves a gap in the scientific data regarding how simple it would be for kids to correctly decode and understand structural, orthographic, and reading processes. As a result, conclusions about the effectiveness of the intervention in orthography may only be made tentatively (Peters et al., 2019).

Intensive Reading Training

According to research, there are weekly variations in the cross-sectional correlations of tissue features, which cause cortical linkages to shift quickly (Facoetti et al., 2003). Phonological awareness is attained by connecting discrete elements in certain reading-related domains, hence facilitating visual word recognition. Longitudinal alterations in numerous distinct white matter tracts that result from shared biological pathways across a vast anatomical scale impact learning. As a result, extensive training in reading abilities coupled with short-term plasticity produces positive benefits across the reading networks (Huber et al., 2018). The anatomy-behavior link changes during learning, according to fMRI results. It is thought to have a steady link with reading ability since the posterior corpus callosum remains rather stable after intervention. White matter tissue characteristics thus alter in response to a focused intervention program that includes extensive reading instruction in the children's learning environment, resulting in the development of phonological decoding abilities. Spelling and understanding are built on intensity and repetition, which involves five hours a day, five days a week, of practicing letters, syllables, words, and related texts under individualized instruction (Facoetti et al., 2003).

Reading Acceleration Program

Another neurocognitive intervention that may be used with children is the rate at which they can monitor their mistakes and cognitive ability. Horowitz-Kraus et al. (2014) state that when children are more aware of their reading faults, they are more engaged and productive in identifying the intended and genuine replies. Reading Acceleration Program (RAP) training leads to several cognitive ability-related reading benefits. However, as EEG only offers spatial information and cannot identify potential alterations in neural circuitry, more research is required to determine spatial resolution and changes in brain activation. Given its importance to the reading process, brain activation levels, particularly those of the frontal lobe, must be detected. Despite being evaluated, these functions did not support reading, thus no particular conclusions can be drawn about the degree of improvement they provide. Consequently, statistical analysis failed to identify any meaningful interactions. The question that now emerges is how a youngster with dyslexia could receive RAP training if their working memory is affected.

Motor Cognition Program

Working memory enhancement programs are thought to help a dyslexic child's reading abilities because working memory is thought to be crucial to the acquisition of knowledge. The processes of information observation, rehearsal, encoding, and retrieval are handled by cognitive psychological memory mechanisms (Li et al., 2010). To

understand and remember things better, kids need to break tasks into smaller parts and store them in their memory for a long time. When kids struggle to remember things, a program called Motor Cognition can help. It helps improve their memory by practicing reading words and paying attention to numbers they hear, remembering them, and saying them out loud. This helps them remember more information and get better at reading.

Computer programs

Thinking about all the different parts of the brain that help with reading, it would be helpful to have a list of those parts to improve how the brain works. For reading to go smoothly, certain key skills are important. These include understanding sounds in words, knowing how words are spelled, understanding what words mean, and having good skills like paying attention, remembering things, and thinking quickly (Horowitz-Kraus et al., 2014). Even though we know some teaching methods work well for certain parts of reading, it's important for reading programs to include a mix of different reading skills. This helps improve all areas of reading. These areas include learning to read better, using different reading strategies, mastering new skills, understanding words deeply, and reading faster. The problem is, it takes a lot of time to teach all these different skills, especially the ones that are hardest for students. So, we might need to change how schools teach or give extra help to make sure students learn what they need to. Sometimes, there aren't enough teachers to help all the students who need it. In those cases, computer programs can be used to support teaching. Research shows that computer programs have some advantages over just having a teacher. Computers can give students practice, talk to them, and give them feedback on their work. This can help students learn better and stay motivated to keep trying. Mioduser et. al., 2000 found that using computers to learn can help kids do better in understanding sounds in words, recognizing words, and naming letters (Mioduser et al., 2000). This helps them learn to read better because they can hear and see things on the computer.

Conclusions

Learning problems, especially dyslexia, have been a big worry for a long time. People have tried different ways to help students learn better. New research shows that besides social and emotional factors, how the brain works also affects learning. Since each person's brain is different and can change, we need to study more about how the brain can change and adapt. This helps in making connections in the brain that help with learning and remembering things. Understanding the challenges that kids with dyslexia face in school and life, we need to study more about how to help them learn better. Using computers and machines to teach could help teachers do their job better. Programs on computers that use different ways of learning could help build connections in the brain that are important for reading. By focusing on certain brain skills, specific computer tasks could create a new way of teaching that helps kids get better at listening, seeing, and moving while learning. Getting feedback from these programs is

not only important for doing well in school but also for feeling good emotionally, so kids don't feel like they're failing. Taking different approaches to dyslexia would include: i) improving working memory, ii) using visual thinking skills, and iii) boosting overall brain functions. Programs that start early and focus on spelling and how words are formed, along with lots of reading practice, could lead to exciting new discoveries in understanding how children develop and how we can help those with dyslexia.

References

Booth, J. R., Wood, L., Lu, D., Houk, J. C., & Bitan, T. (2007, February). The role of the basal ganglia and cerebellum in language processing. *Brain Research*, *1133*, 136–144. https://doi.org/10.1016/j.brainres.2006.11.074

Booth, J. R., Wood, L., Lu, D., Houk, J. C., & Bitan, T. (2007, February). The role of the basal ganglia and cerebellum in language processing. *Brain Research*, *1133*, 136–144. https://doi.org/10.1016/j.brainres.2006.11.074

Eickhoff, S. B., Laird, A. R., Grefkes, C., Wang, L. E., Zilles, K., & Fox, P. T. (2009, January 26). Coordinate-based activation likelihood estimation meta-analysis of neuroimaging data: A random-effects approach based on e mpirical estimates of spatial uncertainty. *Human Brain Mapping*, *30*(9), 2907–2926. https://doi.org/10.1002/hbm.20718

Facoetti, A., Luisa Lorusso, M., Paganoni, P., Umiltà, C., & Gastone Mascetti, G. (2003, January). The role of visuospatial attention in developmental dyslexia: evidence from a rehabilitation study. *Cognitive Brain Research*, *15*(2), 154–164. https://doi.org/10.1016/s0926-6410(02)00148-9

Franceschini, S., Bertoni, S., Gianesini, T., Gori, S., & Facoetti, A. (2017, December 12). A different vision of dyslexia: Local precedence on global perception. *Scientific Reports*, *7*(1). https://doi.org/10.1038/s41598-017-17626-1

Horowitz-Kraus, T., Vannest, J. J., Kadis, D., Cicchino, N., Wang, Y. Y., & Holland, S. K. (2014, September 21). Reading acceleration training changes brain circuitry in children with reading difficulties. *Brain and Behavior*, *4*(6), 886–902. https://doi.org/10.1002/brb3.281

Huber, E., Donnelly, P. M., Rokem, A., & Yeatman, J. D. (2018, June 8). Rapid and widespread white matter plasticity during an intensive reading intervention. *Nature Communications*, *9*(1). https://doi.org/10.1038/s41467-018-04627-5

Judica, A., Luca, M. D., Spinelli, D., & Zoccolotti, P. (2002, June). Training of developmental surface dyslexia improves reading performance and shortens eye

fixation duration in reading. *Neuropsychological Rehabilitation*, *12*(3), 177–197. https://doi.org/10.1080/09602010244000002

Li, N., Liang, J., & Crant, J. M. (2010). The role of proactive personality in job satisfaction and organizational citizenship behavior: A relational perspective. *Journal of Applied Psychology*, *95*(2), 395–404. https://doi.org/10.1037/a0018079

Peters, J. L., De Losa, L., Bavin, E. L., & Crewther, S. G. (2019, May). Efficacy of dynamic visuo-attentional interventions for reading in dyslexic and neurotypical children: A systematic review. *Neuroscience & Biobehavioral Reviews*, *100*, 58–76. https://doi.org/10.1016/j.neubiorev.2019.02.015

Rogalsky, C. (2008). Broca's area, sentence comprehension, and working memory: an fMRI study. *Frontiers in Human Neuroscience*, *2*. https://doi.org/10.3389/neuro.09.014.2008

Yang, J., Peng, J., Zhang, D., Zheng, L., & Mo, L. (2017). Specific effects of working memory training on the reading skills of Chinese children with developmental dyslexia. PloS one, 12(11).

Yang, J., Peng, J., Zhang, D., Zheng, L., & Mo, L. (2017). Specific effects of working memory training on the reading skills of Chinese children with developmental dyslexia. PloS one, 12(11).

Yang, J., Peng, J., Zhang, D., Zheng, L., & Mo, L. (2017). Specific effects of working memory training on the reading skills of Chinese children with developmental dyslexia. PloS one, 12(11).

Yang, J., Peng, J., Zhang, D., Zheng, L., & Mo, L. (2017). Specific effects of working memory training on the reading skills of Chinese children with developmental dyslexia. PloS one, 12(11).

Yang, J., Peng, J., Zhang, D., Zheng, L., & Mo, L. (2017, November 16). Specific effects of working memory training on the reading skills of Chinese children with developmental dyslexia. *PLOS ONE*, *12*(11), e0186114. https://doi.org/10.1371/journal.pone.0186114

Das-Smaal, E. A., Klapwijk, M. J., & van der Leij, A. (1996, June). Training of Perceptual Unit Processing in Children With A Reading Disability. *Cognition and Instruction*, *14*(2), 221–250. https://doi.org/10.1207/s1532690xci1402_3

Grodzinsky, Y. (2000, February). The neurology of syntax: Language use without Broca's area. *Behavioral and Brain Sciences*, *23*(1), 1–21. https://doi.org/10.1017/s0140525x00002399

Ullman, M. T. (2001, October). A neurocognitive perspective on language: The declarative/procedural model. *Nature Reviews Neuroscience*, *2*(10), 717–726. https://doi.org/10.1038/35094573

Joseph, J., Noble, K., & Eden, G. (2001, November). The Neurobiological Basis of Reading. *Journal of Learning Disabilities*, *34*(6), 566–579. https://doi.org/10.1177/002221940103400609

Joseph, J., Noble, K., & Eden, G. (2001, November). The Neurobiological Basis of Reading. *Journal of Learning Disabilities*, *34*(6), 566–579. https://doi.org/10.1177/002221940103400609

Tekin, S., & Cummings, J. L. (2002, August). Frontal–subcortical neuronal circuits and clinical neuropsychiatry. *Journal of Psychosomatic Research*, *53*(2), 647–654. https://doi.org/10.1016/s0022-3999(02)00428-2

Blair, C., & Razza, R. P. (2007, March). Relating Effortful Control, Executive Function, and False Belief Understanding to Emerging Math and Literacy Ability in Kindergarten. *Child Development*, *78*(2), 647–663. https://doi.org/10.1111/j.1467-8624.2007.01019.x

Wanzek, J., Wexler, J., Vaughn, S., & Ciullo, S. (2009, April 22). Reading interventions for struggling readers in the upper elementary grades: a synthesis of 20 years of research. *Reading and Writing*, *23*(8), 889–912. https://doi.org/10.1007/s11145-009-9179-5

Friston, K. (2010, January 13). The free-energy principle: a unified brain theory? *Nature Reviews Neuroscience*, *11*(2), 127–138. https://doi.org/10.1038/nrn2787

Diamond, A. (2013, January 3). Executive Functions. *Annual Review of Psychology*, *64*(1), 135–168. https://doi.org/10.1146/annurev-psych-113011-143750

Oh, A., Duerden, E. G., & Pang, E. W. (2014, August). The role of the insula in speech and language processing. *Brain and Language*, *135*, 96–103. https://doi.org/10.1016/j.bandl.2014.06.003

Binder, J. R. (2015, December 15). The Wernicke area. *Neurology*, *85*(24), 2170–2175. https://doi.org/10.1212/wnl.0000000000002219

Martin, A., Kronbichler, M., & Richlan, F. (2016, April 7). Dyslexic brain activation abnormalities in deep and shallow orthographies: A meta-analysis of 28 functional neuroimaging studies. *Human Brain Mapping*, *37*(7), 2676–2699. https://doi.org/10.1002/hbm.23202

Ardila, A., Bernal, B., & Rosselli, M. (2016, September). The role of Wernicke's area in language comprehension. *Psychology & Neuroscience*, *9*(3), 340–343. https://doi.org/10.1037/pne0000060

Parrila, R. K., & Protopapas, A. (2017, July 27). Dyslexia and word reading problems. *Studies in Written Language and Literacy*, 333–358. https://doi.org/10.1075/swll.15.19par

Aboud, K. S., Barquero, L. A., & Cutting, L. E. (2018, April). Prefrontal mediation of the reading network predicts intervention response in dyslexia. *Cortex*, *101*, 96–106. https://doi.org/10.1016/j.cortex.2018.01.009

Creating Inclusive Classroom for Educating Children with Specific Learning Disabilities: Gaps and Challenges

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Abstract

Inclusion is the means to live by the democratic principles of social equity and justice. It also promotes the idea that every individual person in society must be accorded self - worth and dignity and feel valued and safe. This is particularly significant in the context of persons with disability. Traditional Indian educational setup should be changed as per the needs and demands of a changing culture in which smart technologies are used that promotes teaching and learning.

The aim of this study was create an understanding of strategies for educational effectiveness for children with disabilities. This paper gives a realistic picture of the obstacles encountered and the conditions that must be fulfilled in order to go forward with India's inclusive education implementation process. Today's challenge in the country is to make inclusive practices available to everybody, everywhere and all the time.

Keywords: Inclusion, Classroom Practices, Learning Barriers, Technology

Introduction

Inclusive education is not merely about providing access into mainstream school for pupils who have previously been excluded. The term "inclusive education" refers to a variety of approaches that take into account the educational requirements of children with disabilities. It is not the goal to abolish a deplorable system of segregated education and place those students in an unaltered mainstream system. The physical elements, curricular components, teaching standards and techniques, and leadership responsibilities of the current educational systems will need to alter. This is so that all children and youth may participate in school and that any discriminatory practices are eliminated.

Over the last fifty years, the Indian government has worked to provide children with disabilities with a wide range of educational programs. The state financed Integrated Education for Disabled Children project was established in 1974 to give disabled children

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equal access to mainstream education and to help them stay in the classroom. 'To integrate the handicapped with the general community at all levels as equal partners, to prepare them for normal growth and to enable them to face life with courage and confidence' was the National Educational Policy of 1986, which laid the groundwork for government initiatives in the field of inclusive education. The several procedures already in place in the nation received additional support after the World Declaration on Education for All was ratified in 1990. A training program was started by the Rehabilitation Council of India Act of 1992 to help professionals become better equipped to meet the requirements of students with disabilities. The 2006 National Policy for Persons with Disability aims to define the parameters within which the public, commercial, and civil society sectors must function to guarantee a respectable life for individuals with disabilities and assistance for their caregivers. The most recent development is the Right of Children for Free and Compulsory Education (2009), which ensures that every child between the ages of six and fourteen has the right to free and compulsory education. The Persons with Disability legislation, 1995's Chapter V and this legislation must be read together in order to provide education for a kid with a disability. Every kid with a handicap is guaranteed free education up to the age of eighteen, according to Chapter V of the PWD Act. Considering that, Govt. of India has expedited the implementation of the new inclusive education program in order to meet the 2010 Education for All (EFA) goal. The goal of inclusion is to ensure that a varied range of learners, including individuals with disabilities, speakers of other languages and cultures, families and homes, and interests and learning styles, are included. All pupils, regardless of their talents and shortcomings, will participate in the mainstream educational process, according to inclusive education. It is evident that inclusive education in ordinary schools has evolved into a key policy goal and that India's education policy has progressively placed more emphasis on kids and people with special needs.

The National Education Policy (NEP) 2020 reaffirms the provisions in the RPWD Act regarding inclusive education. The policy takes on a broader inclusion perspective and aims to achieve learning for all, particularly addressing the exclusion of socio-economically disadvantaged groups. The policy emphasizes the importance of inclusion of children with disabilities from early childhood education to higher education, with the provision of assistive devices and teaching and learning materials. The NEP 2020 establishes the National Assessment Centre, PARAKH, to develop guideline and tools for assessing students with specific learning disabilities. It also promotes the use of appropriate communication modes and formats, including augmentative and alternative modes.

Need of the study: We are living in a time where we are talking about inclusion. Even our government policies were putting emphasis on full participation of differently-able of our society. But irony is that still we are facing a lot of trouble in implementing inclusion in full swing. It starts with the fact that these students with specific learning disabilities were not fully accepted in our school set-up. Schools were considered as mini society, where a child understand and learn everything about life. The

government's initiative may promise free education for all children between the ages of six and 14, but those with special needs form the largest out-of-school group in the country. A 2014 'National Survey of Out of School Children' report put the number of special-needs children between six and 13 years of age who are out of school at 600,000." (Hindustan Times June 2017). Prevalence of SLD in schools ranges from 6.1% to 16.49%. Few studies reveal that dropout of children with special needs starts from class five onwards. Our inclusive schools retained 5.3% of SLD in class XII who were enrolled in class 1. The drop out of SLD from the education system is a huge lose. Hence there is a need to make such practices through which their dropout can be prevented and we can use their respective potential in the development of the society.

Methodology: Semi-structure interview schedule is being used to collect data regarding barriers and gaps for successful implementation of inclusive practices. Furthermore challenges and gaps for creating inclusive classroom is analyzed based on case studies. Responses were collected on availability on special education teacher, collaboration between general teacher, special education teachers and parents, parental involvement, faculty development programs, teaching perspective towards inclusion of specific learning disabled children, teacher's anxiety etc during focus group discussion. Brief overview of case studies are presented here.

Case 1: One of the parent while having interaction stated that,' Her child who is diagnosed as learning disabled. When he was studying in a reputed private school of Delhi, he was used to spend her most of the time in special wing of the school. There, most of the time he was playing only. Parent also stated that her child was in class 6th, when he will be detained by the school.

Case 2: Another parent while interaction, stated that as his ward most of the time found with the special educator of the school, when special educator was on leave, his ward would not attend the school as his, regular class teacher would not allow him to sit in the class as he create trouble for him.

Case 3: One of the regular class teacher share her teaching experience while having special need students in her class. She said that, 'it is way too difficult to teach mixed group class. In her class there were four differently-able students. According to her they were mostly found talking to other students and tend to create a lot of disturbance in the class room. Also their special educator tries to do modification for their students, but did not think of its repercussions which I have to face.

Case 4: One of the special educator shared her experience to work in an inclusive set up school. According to this particular special educator, general teachers of their respective students were not willing to corporate with them. There were a constant interactions which at times were not healthy and can be avoided.

Based on the case studies and responses from the teachers following challenges and gaps are highlighted here:

•**Lack of adequate teacher training:** Many teachers lack the necessary skills and

knowledge to effectively support children with special needs in a general classroom setting. In order to create inclusive environment, Trained professionals are required. As per to RCI rule those professional who are having RCI enrolment number are eligible to teach differently able persons. But it was observed that, there were many teachers who were not trained well or having professional qualification, are teaching them. Few are doing this on free will as well. They were not able to meet basic requirements of children with different needs.

- **Insufficient resources:** Lack of necessary assistive technology, specialized learning materials, and adequate support staff can limit a child's ability to participate fully**.**
- **Inflexible curriculum:** Traditional curriculum structures may not be adaptable to cater to different learning paces and needs of children with disabilities. Curriculum modification can be done if students were not able to comprehend, even after repetitive teaching.
- **Attitudinal barriers within the school community:** Negative attitudes towards children with disabilities from peers, teachers, and parents can create a hostile learning environment**.** General education teacher considered that it is not their duty to teacher children with SLDs. At time they used to sit idle in their classrooms or send to the special education wing. Effective communication and collaboration between specialists and classroom teachers is crucial for successful inclusion. But sad reality is that this is missing in inclusive setup.
- **Poor Infrastructure:-**For an inclusive set-up, there were many requirement which were needed. To meet the needs regarding special education section, schools have to create various therapy rooms (like, occupation therapy, physiotherapy, speech therapy, educational classrooms etc). They have to build barrier free infrastructure in the school premises. Along with this, there has to be teaching aids and assistive aids which meets the requirements of students.
- **Financial Limitations:-** To meet the above mention infrastructure needs, school required funds. But school institutions do financial crunch. Due to this reason, school is not able to provide each and every this in the one go. Due to financial crunch, schools were not able to give good salaries to their staff as well. This lead to loose of good teachers as well. If they increase school fee, then there will be resistance from parents.
- **Lack of trained professionals:** In order to create inclusive environment, Trained professionals are required. As per to RCI rule those professional who are having RCI enrolment number are eligible to teach differently able persons. But it was observed that, there were many teachers who were not trained well or having professional qualification, are teaching them. Few are doing this on free will as well. They were not able to meet basic requirements of children with different needs.
- **Student Teacher Ratio:-** Above mention reasons leads to another problem, i.e, large number class size. Schools are having classrooms of 45- 50 students. Classrooms

were congested, which leads to the fact that, there is less or no room for movement. In inclusive classroom, it was required to give enough space to students with special needs (according to the condition / requirement). Use intentional classroom seating to provide students with their own space and help them keep their attention on the lesson. Name tags can be written on table and chair of students with learning disabilities. Their respective time-table should be present in visual form. This will not be possible if we didnot follow the idle class room ratio, i.e, 1:20

The Indian government considers inclusive education to be obligatory and important. Nonetheless, when it comes to inclusive education, there are significant differences in national policy and practice. Several obstacles impede the appropriate implementation of inclusive education in our nation. For accommodating Children with Specific Learning Disabilities we have to remove the barriers and overcome with the challenges highlighted by the in service teachers.

- **Faculty Development Programs:** It was observed that, teachers who are teaching SLDs are not well qualified. General education teachers of primary and secondary schools considered their own competence for dealing with children with disabilities to be restricted or poor. Also they were not able to plan effective lesson plans. Hence school should provide appropriate training to their general teachers and trainers on early identification and intervention for SLDs in school.
- **Parental Involvement**: In our society, parents plays an important role. Inclusion practices can only be successful if both teachers/ school and family came together for the betterment of students who are having special needs. Schools should conduct awareness and sensitize programs for parents of SLD. Unknowingly parents put a lot of pressure on their wards, as they were not able to understand that their child is having his / her own limitations and his / her performance will be accordingly to his potential.
- **Collaboration between general and special education teacher**: It was observed that, regular teacher considered that they were not able to teach a child who is having specific learning difficulty. They were not willing to answer quires of those students. It was shared by one of the respondent that, their class teacher asked them to go to their special need teacher and ask his quires. At times regular teachers tends to avoid students having special needs. There are many identified red flags which help parents / general education teacher to do early screening of children who might have SLD. Teachers should be trained to identify signs of learning disabilities and ADHD early on.
- **Sensitization for Attitudinal modification of teachers :**Teachers with pessimistic views think that special education settings should provide special services to them in order to spare their normally developing classmates in regular classrooms, and they see inclusion as a burden on instructors (Zambelli & Bonni, 2004). It has been discovered by several investigations that general education instructors do not

endorse inclusion. Regular teachers tends to avoid special need students of their class. As they are having huge class strength, whose learning out- come was their responsibility. As a result regular class teacher send these students to special wings / special educators. It was reported by a parent whose ward was studying in a reputed private school that," in school, class teacher used to send her child to special wing, where he was made to sit idle and there was no special educator to entertain him.

- **Zero rejection for admission of SLDs:** Schools have to maintain their academic achievement record. There was a huge pressure regarding the same. It was observed over the period of time that there was huge drop rate of students after class 8., which include both regular students who were not score pass percentage and special needs students. After drop out, it was observed that, students enrolled themselves in NIOS, from there they completed their respective school education.
- **Technology Integration in teaching learning process:** All students in a class at an inclusive school must be taught by the same teachers. The school has an obligation to offer a flexible curriculum that can be available to all students, even children with special needs. It is imperative that educational institutions offer enabling experiences to ensure that youngsters attain their full potential and succeed in their studies. This is only achievable if educators modify the curriculum to reflect the diversity found in an inclusive classroom. Curriculum adaptation involves differentiation to meet the needs of all students. The content, the teaching process, assessment and evaluation, and the physical environment may be modified to help students to achieve success in the classroom. The kind of activities chosen by the teacher, including group activities, must be flexible and reflect the background knowledge of small groups or individual students. The following shows the adaptations that are required in different areas for inclusive pedagogy.

Assistive devices are tools that help people with disabilities or impairments perform tasks and improve their quality of life. They can help with a variety of functions, including hearing, seeing, communicating, and moving around. Assistive technology (AT) can help people with learning disabilities in many ways, including reading, writing, math, and more. There are many types of AT devices and services, including: text-to-speech, speech recognition, screen reader, magnifiers etc.

- **Comprehensive assessment and evaluation:** Assessment of students can be done orally or in a way where written part was less or with less weight age. Examination can be done framed in a way where theoretical understanding will be check. Questions can be based on multiple choice questions. Focus should be on the understanding of the concept and on its implications, rather than on written aspect. Extra time should be given to students, which allows them to go through question paper and revise their respective answer sheets. Along with this reminders should be given on regular intervals. Also writers can be provided to them.

Conclusion:

Inclusive education needs to be a comprehensive strategy central to all teacher education. This will help them to be sensitive towards students who were having special needs and were struggling in the classrooms of regular schools. Parents and teachers repo is a must. In special education, it took time to achieve results. Initially, these results were very nominal's. If all those who were in involve in inclusive education set-up have to patience and adjective. If we all work together, only then it work better. Otherwise it will become nightmare for everyone.

Reference:

Ashalatha D, Nagaraju MTV. Effective Curriculum Design, Instruction and Resources for Inclusive Education, 2014, 1-7.

Das, A. K. (2001). Perceived training needs of regular primary and secondary school teachers to implement inclusive education programs in Delhi, India. Unpublished doctoral dissertation, The University of Melbourne.

Koli, Padmavaathi. Effective Curriculum Design, Instructional Strategies in Inclusive Classroom, 2014, 104-109. 3. Mara, Daniel, Mara Elena-Lucia. Curriculum adoption in inclusive education, 2012, 1-6

Nilholm, C., & Alm, B. (2010). An inclusive classroom? A case study of inclusiveness, teacher strategies, and children's experiences. European journal of special needs education, 25(3), 239-252.

Penner, M. R. (2018). Building an inclusive classroom. Journal of Undergraduate Neuroscience Education, 16(3), A268.

Singh, J. D. (2016). Inclusive education in India–concept, need and challenges. S. No. Paper Title Author Name Page No, 97.

http://timesofindia.indiatimes.com/articleshow/77032096.cms?utm_source=contentofinterest&utm_medium=text&utm _campaign=cppst

Yoga as a Creative Therapy for SLD
SLD के लिए एक रचनात्मक चिकित्सा के रूप में योग

Imran Khan[1]

शोधसार (Abstract)

भारतीय संस्कृति में प्राचीन काल से ही योग पद्धति का उपयोग व्यक्ति के शारीरिक, मानसिक और आध्यात्मिक विकास के लिए किया जाता रहा है और आज के इस तनाव-पूर्ण माहौल में भी योग का अभ्यास न केवल भारतीयों के लिये उपयोगी है अपितु आज वैश्विक जगत में सम्पूर्ण मानव जाति के लिए कल्याणकारी है योग के महत्व को देखते हुए तथा इसके द्वारा व्यक्ति के जीवन में पड़ने वाले सकारात्मक प्रभावों के कारण भारत के साथ-साथ अन्य देशों के लोग भी यौगिक क्रियाओं के माध्यम से इसके अभ्यास के द्वारा अपने जीवन में शारीरिक व मानसिक स्वास्थ्य का लाभ ले रहे हैं। इस अध्ययन का उद्देश्य स्पेसिफिक लर्निंग डिसेबिलिटी वाले लोगों और मुख्यरूप से बच्चों पर योग के लाभों की जाँच करना है। स्पेसिफिक लर्निंग डिसेबिलिटी के अन्तर्गत पढ़ने, लिखने, बोलने, सुनने आदि विकारों को रखा जाता है। मुख्यतः डिसेबिलिटी का कारण अनुवांशिक,पर्यावरणीय और जैविक होता है। इस अध्ययन में क्रियात्मक योग ग्रन्थ हठ प्रदीपिका, घेरण्ड संहिता, योगाभ्यासों की अध्यापन विधियां और योगनिद्रा आदि से आहार विहार, आसन, प्राणायाम, मुद्राबन्ध, षटकर्म, ध्यान व योगनिद्रा आदि के स्पेसिफिक लर्निंग डिसेबिलिटी वाले लोगों पर सकारात्मक प्रभाव और लाभों का विस्तार से उल्लेख किया गया है।

परिचय

योगविद्या भारत की सबसे प्राचीन जीवन पद्धति और चिकित्सीय विज्ञान हैं जो व्यक्ति को प्रदर्शन के उच्च स्तर को प्राप्त करने में सक्षम बनाता हैं जिससे भीतर की अक्षमताओ को प्रकट

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करने में मदद मिलती हैं। पंडित श्रीराम शर्मा कहते हैं कि योग जीवन जीने की एक कला है जिससे जीवन का सर्वागीण विकास अर्थात् योग शारीरिक, मानसिक, आध्यात्मिक,नैतिक व सामाजिक विकास करने में सक्षम हैं जीवन में सुख, समृद्धि, शक्ति और अच्छे स्वास्थ्य के लिए हर व्यक्ति को योगाभ्यास करना चाहिए। [1]

युवा वृद्धोऽतिवृद्धो वा व्याधितो दुर्बलोऽपि वा ।

अभ्यासात् सिद्धिमाप्नोति सर्वयोगेष्वतन्द्रितः ।। [2]

योग के प्रमुख ग्रन्थ **हठप्रदीपिका** में बताया गया है कि योग एक सुरक्षित और विश्वसनीय अभ्यास है जिसे कोई भी और किसी भी उम्र में कर सकता है चाहे वो साधक युवा हो ,वृद्ध हो ,रोगी हो या दुर्बल हो , आलस्यरहित होकर नियमों का पालन करते हुए योग का अभ्यास करने से उत्तम स्वास्थ्य की प्राप्ति की जा सकती है अतः योग ने कभी भी उम्र ,लिंग ,जाति या धर्म की बाधा को नही माना है जिनके कोई अंग जन्म से नही हैं या फिर किसी दुर्घटना के कारण अब नही हैं वो भी योग का अभ्यास कर सकते हैं।

पतंजलि के योग सूत्र में मन व शरीर को नियंत्रित करने पर विशेष बल दिया गया हैं पतंजलि के अनुसार मन को नियंत्रित करके सभी प्रकार कि मनोकायिक बीमारयों से बचा जा सकता हैं योग सूत्र में मन को नियंत्रित करने उपायों के साथ साथ मन को नियंत्रित करने में आने वाली बाधाओं से बचने के उपायों का भी विस्तार से वर्णन किया गया है पतंजलि ने मन की अवस्थाओ को पांच भागों में बांटा हैं मूढ़ (सुस्त), क्षिप्त (विचलित), विक्षिप्त (आंशिक रूप से विचलित), एकाग्र और निरुद्ध (नियंत्रित)। [3]

स्पेसिफिक लर्निंग डिसेबिलिटी वाले लोगो में विभिन प्रकार की शारीरिक व मानसिक विकलांगताएँ होती हैं जो उनकी मानसिकता को प्रभावित करती हैं जिससे उनके अंदर आत्मविश्वास की कमी ,जागरूकता और हीनभावना से जुडी समस्याएँ जन्म लेती हैं। जिन कार्यो को लोग आसानी पूर्वक करने में समर्थ होते हैं वहीं ऐसे लोग(एस. एल. डी.) उन कार्यो को करने में कठिनाई या असमर्थता के कारण निराश व तनाव का शिकार हो जाते हैं।

स्पेसिफिक लर्निंग डिसेबिलिटी एक ऐसा विकार है जो मुख्यतः देखने और सुनने की क्षमता और तंत्रिका तंत्र को प्रभावित करता हैं।

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[2] 1/64 -स्वामी स्वात्माराम कृत ,हठप्रदीपिका-केवल्यधाम लोनावला , 2017

[3] YOGA FOR CHILDREN WITH SPECIAL NEEDS-blog.mygov.in, 30-05-2017

कुछ समय नियमित योगाभ्यास करने के पश्चात बच्चों की बुनियादी मोटर (basic motor) जैसे- चलना ,उठना ,बैठना ,संचार और संज्ञानात्मक कौशल (communicative and cognitive skills) में जबरदस्त सुधार से सभी को आश्चर्य चकित कर देते हैं वे योगाभ्यास की मदद से अपनी दिन प्रतिदिन कि गतिविधियों में अधिक एकाग्रता ,संतुलन और नियंत्रण विकसित करते हैं वास्तव में कोई नही जानता परिणाम क्या होगा लेकिन हम यह जानते हैं कि योग बच्चो को फिर से बनाने , परिष्कृत और पुनः परिभाषित (refine and redefine) करने में मदद करता हैं जो सकारात्मक सुधार की नीव रखता हैं। [1]

योगानुशासन अनेक अवस्थाओं से गुजरा और समय के साथ साथ उसके विभिन सम्प्रदायों ने जन्म लिया। योग के विषय में अनेक भ्रामक धारणाएं प्रचलित हुई जैसे योग सामान्य व्यक्तियों के लिए नही है अपितु कुछ विशेष लोगों के लिए है, योग चमत्कारों से जुडा हुआ है, योग एक चिकित्सा पद्धति है जो सभी रोग ठीक कर सकती हैं ,आदि ये सारी भ्रामक धारणाएँ यह दर्शाती है कि अधिकांश लोग योग को एक पूर्ण धारणा के रूप में देखने में असमर्थ हैं उन्हें केवल योग की क्षमता का आंशिक आभास है वास्तव में यौगिक अभ्यास व्यायाम नही है जिस अर्थ में व्यायाम शब्द लिया जाता है साधारणतया व्यायाम का अर्थ प्रबल शारीरक हलचलें या क्रियायें होती हैं चूंकि यौगिक अभ्यासों में शारीरिक गतियाँ (हलचल)नही होती हैं इसलिए यौगिक अभ्यासों में प्रबल हलचलें टालनी चाहिये यौगिक अभ्यासों की प्रकृति विविधतायुक्त हैं जिनमें विविध युक्तियाँ(MECHENISM) प्रयुक्त हैं अभ्यास की दृष्टि से योग अभ्यासों को चार वर्गों में बांटा जा सकता है (१) प्रारंभिक छात्र (२) अनुभवी व प्रगति छात्र (३) विद्यालय छात्र (४) विशेष ध्यान दिए जाने योग्य समूह।

अपंगत्व, विकृतियों और व्यक्तिक स्वास्थ्य वाले अभ्यासियों को विशेष ध्यान देने योग्य समूह में रखा जाता है जिससे उन्हें उनकी जरूरत के अनुसार अभ्यास कराया जा सके। [2]

यौगिक सूक्ष्म व्यायाम -जिन्होंने पूर्व में कभी योगासनों का अभ्यास नही किया या किसी रूप में अशक्त और कमजोर हैं उनको यौगिक सूक्ष्म व्यायाम से योगाभ्यास आरम्भ करना चाहिए।

यौगिक सूक्ष्म व्यायाम में मुख्यतः गर्दन , कंधो , कोहनी ,कलाई ,घुटनों और टखनों को तानना व घुमाने के साथ साथ आँखों के व्यायाम को भी शामिल किया गया।

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[1] 1/1 , पतंजलि योग दर्शन व्यास भाष्य, व्याख्याकार डॉ. सुरेशचन्द्र श्रीवास्तव चोखाम्बा सुरभारती प्रकाशन वाराणसी, 2021

[2] पृ. सं. 22-44 , घरोटे, डॉ. मनोहर लक्ष्मण ,गांगुली ,डॉ. श्रीमंत कुमार –योगाभ्यासों की अध्यापन विधियां केवल्यधाम लोनावला, 2018

आँखों के यौगिक व्यायाम के अंतर्गत आँखों की पेशियों की क्रियायें शामिल हैं ये यौगिक क्रियायें नेत्र तंत्रिका (optic nerve) को मजबूत करती है,चेहरे की मांसपेसियो को आराम देती है, मस्तिष्क के विभिन केन्द्रों को उत्तेजित करती है ,ध्यान केन्द्रित करने की क्षमता में सुधार और शब्द पहचानने के कौशल को बढाती है। डिस्लेक्सिया से पीडित बच्चों को आँखों के यौगिक व्यायाम से विशेष लाभ प्राप्त होता है। [1]

सूर्य नमस्कार –सूर्य नमस्कार गतिशील आसनों का एक समूह है जो शरीर के सभी जोड़ो एंव मांसपेशियों को ढीला करने तथा उनमें खिचांव लाने और आन्तरिक अंगो की मालिश करने का एक प्रभावी ढंग है जो उत्तम स्वास्थ्य के साथ साथ पूरे शरीर में ऊर्जा परिसंचरण को बढ़ाने में मदद करता है यह अन्तःस्रावी , रक्त परिसंचरण , श्वसन और समस्त शारीरिक संस्थानों को उद्दीप्त और संतुलित करता है। पीयूष ग्रन्थि और हाइपोथैलेमस पर इसका जो प्रभाव होता है उससे पीयूष ग्रन्थि का अपक्षय और कैल्सीकरण(Weathering and calcification) रुक जाता है। बढ़ते बच्चों में बाल्यावस्था और किशोरावस्था के बीच जो संधिकाल होता है , यह उसमें संतुलन लाता है सूर्य नमस्कार फेफड़ों से कार्बन डाइऑक्साइड का निष्कासन कर उनमें ताजी ऑक्सीजन भर देता है, जिससे मस्तिष्क को ताजा, ऑक्सीजन युक्त रुधिर प्राप्त होता है। फलतः मानसिक स्पष्टता में वृद्धि होती है। [2]

कुर्यात्तदासनं स्थैर्यमारोग्यं चाङ्गलाघवम् आसनं [3]

आसन - मानसिक तथा शारीरिक अभ्यास है आसन मन व शरीर की एकीकरण विधि का आधार बनते हैं जो शारीरक व मानसिक स्थिरता ,आरोग्यता तथा शरीर में हल्कापन लाते हैं हालांकि सभी अभ्यासी सभी आसनों का अभ्यास करने में सक्षम नही हो सकते लेकिन ऐसे बहुत से आसन हैं जो सभी कर सकते हैं लेकिन विकलांगता के प्रकार के आधार पर अधिकांश आसनों को उनके लिए संशोधित किया जा सकता है वास्तव में बहुत कम शारीरिक हलचल किये बिना विभिन्न आसनों का अभ्यास कराया जा सकता है ऐसे बहुत से गंभीर रूप से विकलांग व्यक्तियों के उदाहरण हैं जो अपने बिस्तर या व्हीलचेयर से योग का अभ्यास करते हैं आसन का अभ्यास सही ढंग से किया जाये तो ज्यादा प्रभावशाली होता है आसन प्रत्येक अभ्यासी कि क्षमता के अनुसार किये जाते हैं मानसिक विकलांगता का सम्बन्ध हमारे तंत्रिका तंत्र(nervous system) से होता हैं

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[1] पृ.सं.76-87 , सरस्वती ,स्वामी सत्यानन्द -आसन प्राणायाम मुद्रा बन्ध, योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार, 2017

[2] पृ. सं.165-178, सरस्वती ,स्वामी सत्यानन्द, आसन प्राणायाम मुद्रा बन्ध, योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार, 2017

[3] 1/17 , स्वामी स्वात्माराम कृत ,हठप्रदीपिका-केवल्यधाम लोनावला , 2017

सर्वांगासन और शीर्षासन ऐसे आसनों की श्रेणी में आते हैं जिनका सीधा सम्बन्ध मस्तिष्क और पीयूष ग्रंथि से होता है ये आसन मस्तिष्क और पीयूष ग्रंथि में रक्त प्रवाह को बढाता है जिससे सम्पूर्ण शरीर एंव मन को नवजीवन प्राप्त होता है यह भावनात्मक , मानसिक तनाव ,भय और सर दर्द को दूर करने में सहायक हैं। [1]

आत्मविशवास और शरीर को लचीला बनाने के लिए अभ्यासी को पीछे कि और झुकने वालें आसनों का अभ्यास कराया जाता है जैसे भुजंगासन ,उष्टासन ,चक्रासन और धनुरासन जो कमर कंधो और छाती को सुदृढ़ता व गति प्रदान करतें हैं धनुरासन के विषये में हठप्रदीपिका में बताया गया है कि मेरुदण्ड में लचीलापन होने के कारण पूरे शरीर में ताजगी का अनुभव होता है मेरुदण्ड, जो तना हुआ और कड़ा रहता है वह ढीला हो जाता है। मेरुदण्ड को कड़े होने के कारण तन्त्रिका तन्त्र में जो व्यवधान उत्पन्न होते हैं, वे दूर हो जाते है। यह कूबड़ के उपचार में सहायक होता है । " विशेषतः इसका अभ्यास मेरुदण्ड से सम्बन्धित रोगों , जैसे , स्लिपडिस्क , स्पॉण्डिलाइटिस या सायटिका के उपचार के लिए कराया जाता है । [2]

संतुलनात्मक आसन- वृक्षासन ,एक पादासन ,नटराजासन और मयूरासन आदि प्रमुख सन्तुलनात्मक आसन हैं यें आसन मस्तिष्क केन्द्र, लघु मस्तिष्क को विकसित करते हैं , जो शारीरिक गतिविधियों को नियन्त्रित करता है । अधिकतर लोगों की शारीरिक गतिविधियों में समन्वय (coordination) नहीं रहता , जिसके कारण असन्तुलन आता है और शरीर को अचानक गिरने या चीजों से टकराने से बचने के लिए लगातार अतिरिक्त प्रयास करते रहना पड़ता है । कार्य करने की इस अकुशल विधि में अधिकतम प्रयास करने की आवश्यकता पड़ती है और ऊर्जा का क्षय होता जबकि परिणाम न्यूनतम मिलता है। फलस्वरूप शरीर पर अतिरिक्त दबाव पड़ता है ये आसन शारीरिक सन्तुलन लाते हैं , जिससे अचेतन रूप से होने वाली शारीरिक हलचलें समाप्त हो जाती हैं । जैसे - जैसे गतिमान शरीर सन्तुलन प्राप्त करता है , वैसे - वैसे वह सहारे एवं आगे बढ़ने के लिए अन्य बलों , जैसे , गुरुत्वाकर्षण पर निर्भर रहने के लिए अधिक स्वतंत्र होता जाता है । इस प्रकार शरीर स्वयं अपनी ऊर्जा का संरक्षण करता है और इसकी गति में मनोहरता एवं सौम्यता आती है । शारीरिक सन्तुलन प्रदान करने के साथ - साथ इस समूह के आसन सन्तुलित मन एवं जीवन के प्रति अधिक परिपक्व दृष्टि का विकास करते हैं । स्थिरतापूर्वक इन आसनों को करने के लिए जिस एकाग्रता की आवश्यकता होती है ,उससे भावनात्मक , मानसिक एवं आत्मिक स्तरों पर भी एकाग्रता और सन्तुलन का विकास होता है । तन्त्रिका तन्त्र को सन्तुलित करने और तनाव

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[1] पृ. सं.277-294, सरस्वती ,स्वामी सत्यानन्द -आसन प्राणायाम मुद्रा बन्ध, योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार 2017

[2] 2/19 , सरस्वती , स्वामी निरंजनानन्द घेरण्ड संहिता योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार , 2011

एवं चिन्ता को दूर करने में इन आसनों की विशेष भूमिका है । इसके अतिरिक्त संतुलनात्मक आसनों का अभ्यास हाथ व पैरों की मांसपेशियों को मजबूत स्नायुओं को स्वस्थ तथा जोडों को ढीला बनता है। [1]

उत्तानं शववत् भूमौ शयनं तु शवासनम्।

शवासनं श्रमहरं चित्तविश्रान्तिकारणम् ।।[2]

सबसे आखिर में शवासन का अभ्यास किया जाता हैं क्योंकि यह अभ्यास सम्पूर्ण मनोकायिक संस्थान को विश्रान्त बनाता है, शरीर की थकान को दूर करता है और शरीर एवं मन को शान्त तथा शिथिल बनाकर यह आसन तनावजन्य रोगों का निवारण करता है।

प्राणायाम -श्वास शरीर की सबसे महत्त्वपूर्ण प्रक्रिया है। यह प्रत्येक कोशिका के कार्यकलाप को प्रभावित करती है और सबसे महत्त्वपूर्ण बात यह है कि यह मस्तिष्क के कार्य से भी घनिष्टतापूर्वक जुड़ी हुई है। मानव प्रति मिनट 15 बार और प्रतिदिन 21,600 बार श्वास लेता है । श्वसन ऑक्सीजन और ग्लुकोज के दहन के लिए ईंधन प्रदान करता है , जिससे प्रत्येक पेशीय संकुचन , ग्रंथि स्राव और मानसिक क्रिया के संचालन हेतु ऊर्जा का उत्पादन होता है । श्वास का मानवीय अनुभूति के सभी पक्षों से घनिष्ट सम्बन्ध है।अधिकतर लोग अपने फेफड़े की क्षमता के थोड़े ही भाग का उपयोग कर गलत ढंग से श्वसन करते हैं। इस कारण शरीर अपने उत्तम स्वास्थ्य के लिए अनिवार्य ऑक्सीजन और प्राण से वंचित रह जाता है । प्राणायाम की कुछ तकनीकों के माध्यम से श्वसन मार्गो और फेफड़ो की कार्य क्षमता को बढाने के साथ साथ उनकी सफाई भी की जाती है जो भी रोग श्वसन संस्थान और प्राण के प्रवाह से सम्बन्ध रखती है उनके लिए प्राणायाम का अभ्यास रामबाण सिद्ध हो सकता है मुख्यतःमानसिक असंतुलन की समस्याएँ जैसे निराशा ,चिंता और परेशानी प्राणायाम के अभ्यास से कम किया जा सकता है। [3]

प्राणायाम विशेष रूप से सहनशक्ति , संतुलन और ऊर्जा के बेहतर परिसंचरण द्वारा नींद में सुधार करता है।

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[1] 2/36,37 - सरस्वती , स्वामी निरंजनानन्द घेरण्ड संहिता योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार, 2011

[2] 1/32 , स्वामी स्वात्माराम कृत ,हठप्रदीपिका-केवल्यधाम लोनावला, 2017

[3] पृ. सं.387-392 , सरस्वती ,स्वामी सत्यानन्द -आसन प्राणायाम मुद्रा बन्ध, योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार 2017

भ्रामरी प्राणायाम – भ्रामरी प्राणायाम से क्रोध, चिंता एंव अनिद्रा का निवारण होता है इसके अलावा रक्त चाप को घटाकर प्रमस्तिष्कीय (cerebral) तनाव एंव परेशानी को दूर करता है यह शरीर के ऊतको के स्वस्थ होने की गति को बढ़ाता है यह आवाज को सुधारता एंव मजबूत बनाता है। [1]

उज्जायी प्राणायाम शांति प्रदायक मन जाता हैं जिसके अभ्यास शरीर के तापमान में वृध्दि करता हैं और तंत्रिका तंत्र को स्वस्थ बनता हैं इसके साथ साथ मानसिक स्तर का शिथलीकरण ,अनिद्रा को दूर तथा ह्रदय गति को नियंत्रित करता है । [2]

शीतली प्राणायाम डाउन सिंड्रोम से प्रभावित बच्चों के लिए बहुत उपयोगी है क्योकि डाउन सिंड्रोम ग्रस्त बच्चों कि जीभ मोटी हो जाती हैं और बोलने में कठिनाई आती हैं ।

प्राणायाम और आसन का अभ्यास विभिन्न शारीरिक कार्यो को संतुलित और एकीकृत करके भावनात्मक रूकावटो और नकारात्मक आदतों को दूर करने में मदद करता हैं ।

षटकर्म - कुछ षटकर्म जैसे कपालभाति,त्राटक एकाग्रता विकसित करने के लिए बहुत उपयोगी सिद्ध हो सकते है कपालभाति मस्तिष्क के सामने के भाग को शुद्ध करने का एक उत्तम अभ्यास हैं इस अभ्यास के समय अधिक मात्रा में ऑक्सीजन अन्दर जाती है और कार्बनडाई बहार निकलती है यह मन को शांत व जागरूक बनाने के लिए शक्तिशाली विधि है इसके अलावा कुंजल क्रिया और नेति क्रिया के अभ्यास से मानसिक मंदता में सुधार आता है तथा आँखों से जुडी समस्याओं के लिए बहुत फायदेमंद साबित होती हैं। [3]

मुद्रा – कुछ मुद्रायें जैसे काकी मुद्रा , शाम्भवी मुद्रा और योनि मुद्रा आदि ध्यान में शरीर और मन को अधिक स्थिर बनाती हैं और एकाग्रता, सजगता एंव आन्तरिक शारीरिक शिथिलीकरण का विकास करती हैं।

योग निद्रा –आधुनिक स्नायु शरीर वैज्ञानिकों ने यह सिद्ध कर दिया है कि मस्तिष्क और शरीर के बीच गहरा और स्पष्ट सम्बन्ध हैं जिसके अंतर्गत मस्तिष्क चेतना के शारीरिक रूप को मन, शरीर एंव भावनात्मक रूप से जोड़ता है तथा उनमें एकता पैदा करके जीवन को संतुलित करने का कार्य करता है योग निद्रा मस्तिष्क और शरीर को जोड़ने की एक पद्धति है जिसके अभ्यास से पूर्ण शारीरिक, मानसिक और भावनात्मक विश्रांति आती है योग निद्रा के अभ्यास में चेतना को शरीर के प्रत्येक अंग के प्रति सजग व विभिन प्रकार की संवेदनाए जैसे गर्मी ,सर्दी ,पीड़ा और सुख

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[1] 5/83, सरस्वती , स्वामी निरंजनानन्द घेरण्ड संहिता योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार 2011

[2] 5/72,73- सरस्वती , स्वामी निरंजनानन्द घेरण्ड संहिता योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार, 2011

[3] पृ. सं. 501 -506 , सरस्वती ,स्वामी सत्यानन्द, आसन प्राणायाम मुद्रा बन्ध, योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार 2017

इत्यादि का अनुभव कराकर मन को शांत किया जाता है योग निद्रा में मन का विश्राम ही शरीर का विश्राम माना जाता हैं।

योग निद्रा के अभ्यास के समय जब गहरी चेतना की अवस्था होती है तो जो भी अवचेतन में बीजरोपण करते हैं वह विकसित होता है और उसका प्रभाव जीवन के प्रत्येक पक्ष को समर्द्ध बनाता है। [1]

ध्यान –किसी विषय या वस्तु पर एकाग्रता या चिंतन कि क्रिया ध्यान कहलाती है ध्यान कि परिभाषा देते हुए महर्षि घेरंड ने कहा हैं कि जब ध्यान में प्रत्यक्ष अनुभूति होने लग जाये तब उस अवस्था को वास्तविक ध्यान कहा जा सकता है अर्थात् जैसे हम अपनी आँखों के सामने एक पदार्थ को स्पष्ट देख सकते हैं उसी प्रकार अगर हम अपने मन में सुक्ष्म अनुभवों को मन द्रष्टि के सामने स्पष्ट कर सके तो यही ध्यान की अवस्था हैं ध्यान का अभ्यास अकेलेपन को दूर करके एकाग्रता बढ़ाता है तथा तनाव को कम करके मन को शांति प्रदान करता है लेकिन मानसिक रूप से विकलांग लोगों के लिए मुश्किल अभ्यास हैं। [2]

विशेष बच्चों के लिए योग के लाभ

- योग मन , शरीर और भावनाओं की गतिविधियों में सहयोग स्थापित करने में मदद करता है मन की विचलित स्थिति को ठीक करता है तथा एकाग्रता का निर्माण करता है।
- आत्मविश्वास बढ़ाता है तथा हीन भावना की प्रवृत्ति को दूर करता है।
- स्वयं और दूसरों को हानि पहुंचाने के नकारात्मक गुना की प्रवृत्ति को काम करता है।
- बच्चों में लार टपकने को नियंत्रित करता है।
- आंखों की कार्य क्षमता में सुधार करता है।
- नींद और भूख में सुधार करता है ।
- प्रतिरक्षा प्रणाली में सुधार करते हैं।
- संपूर्ण स्वास्थ्य की समस्याओं का समाधान करता है ।
- अतिसक्रीयता को कम करता है।

[1] पृ. सं.40-47 , सरस्वती ,स्वामी सत्यानन्द – योग निद्रा ,योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार, 2005

[2] 339-340 , सरस्वती , स्वामी निरंजनानन्द घेरण्ड संहिता योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार, 2011

- दवाओं पर निर्भरता में कमी लाता है तथा तंत्रिका तंत्र को मजबूत कर उसकी कार्य क्षमता को बढ़ाता है।[1]

डाउन सिंड्रोम से ग्रस्त बच्चे औंसतन कद में छोटे, सर के पीछे का भाग चपटा होना, कान थोड़े नीचे होना ,ऊंचा सुनना, मानसिक मंदता आदि का शिकार होते हैं। [2]

योग का अभ्यास शरीर में स्फूर्ति, एकाग्रता तथा स्मृति के विकास में सहायक है तथा विकासात्मक विकलांगता वाले किसी भी बच्चों के लिए महत्वपूर्ण कौशल प्रदान करता है।

अटेंशन डिफिसिट हाइपरएक्टिव डिसऑर्डर से पीड़ित बच्चों में उनकी अति सक्रियता और ध्यान भटकने की क्षमता के कारण सीखने में देरी होती है। योग के अभ्यास के माध्यम से तनाव , चिंता और निराशा को दूर करके मन को संतुलित किया जा सकता है योग महत्वपूर्ण सीखने की कला को विकसित करने के लिए सही मंच प्रदान करता है।

निष्कर्ष- *आज के इस युग में विकलांगता को ठीक करने के लिए आधुनिक चिकित्सा पद्धतियों का उपयोग किया जा रहा है परन्तु आधुनिक चिकित्सा की कोई भी पद्धति पूरी तरह कारगर साबित नही होती है आधुनिक चिकित्सा मरीज को तुरंत आराम के उपायों पर काम करती है इसलिए आधुनिक चिकित्सा पद्धतियों को विकलांगता को ठीक करने में कम मात्रा में सफलता मिली है विकलांगता में दिए जाने वाले उपचार की तुलना में योग पद्धति को अधिकलाभदायक पाया गया है क्योंकि इसको ठीक करने के लिए अधिकतर छोटी बड़ी ट्रेंकुलाइजर अवसाद रोधी और ऐंठन रोधी दवाई दी जाती है इन दावों का व्यापक प्रभाव होता है लेकिन इन प्रभावों के साथ-साथ दुष्प्रभाव भी देखने को मिलते हैं योग एक अनुभूति शास्त्र (experiential science) जिसकें अंतर्गत शारीरिक ,बायोकेमिकल और मनोवेज्ञानिक लाभों को मापा और स्थापित किया गया है योग में अभी भी अनुसंधान बहुत उच्च स्तर पर नहीं हुए हैं परन्तु यह प्रामाणिक रूप से कहा जा सकता है कि योग का अभ्यास शारीरिक मानसिक लाभों के अलावा आनंदित ,अच्छे बुरे की समझ विकसित करना तथा कल्याण की भावना को जन्म देता है योग के अभ्यास से मन की प्रसन्नता धारण की भावना तथा जीवन की गुणवत्ता में सुधार आता है।*

References:

सरस्वती ,स्वामी सत्यानन्द – योग निद्रा ,योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार , 2005

पृ. सं. 22-44 , घरोटे, डॉ. मनोहर लक्ष्मण ,गांगुली ,डॉ. श्रीमंत कुमार –योगाभ्यासों की अध्यापन विधियां केवल्यधाम लोनावला, 2018

[1] सरस्वती ,स्वामी सत्यानन्द -आसन प्राणायाम मुद्रा बन्ध, योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार २०१७

[2] https://my-clevelandclinic-org.

पृ.सं.76-87 , सरस्वती ,स्वामी सत्यानन्द -आसन प्राणायाम मुद्रा बन्ध , योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार, 2017

पृ. सं.165-178, सरस्वती ,स्वामी सत्यानन्द, आसन प्राणायाम मुद्रा बन्ध, योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार, 2017

पृ. सं. 277-294, सरस्वती ,स्वामी सत्यानन्द -आसन प्राणायाम मुद्रा बन्ध , योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार 2017

11 2/36,37 - सरस्वती , स्वामी निरंजनानन्द घेरण्ड संहिता योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार, 2011

पृ. सं. 387-392 , सरस्वती ,स्वामी सत्यानन्द -आसन प्राणायाम मुद्रा बन्ध , योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार 2017

5/72,73- सरस्वती , स्वामी निरंजनानन्द घेरण्ड संहिता योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार, 2011

पृ. सं. 501 -506 , सरस्वती ,स्वामी सत्यानन्द , आसन प्राणायाम मुद्रा बन्ध , योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार 2017

पृ. सं. 40-47 , सरस्वती ,स्वामी सत्यानन्द – योग निद्रा ,योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार, 2005

339-340 , सरस्वती , स्वामी निरंजनानन्द घेरण्ड संहिता योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार, 2011

सरस्वती ,स्वामी सत्यानन्द -आसन प्राणायाम मुद्रा बन्ध , योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार २०१७

1/32 , स्वामी स्वात्माराम कृत ,हठप्रदीपिका-केवल्यधाम लोनावला, 2017

1/64 -स्वामी स्वात्माराम कृत ,हठप्रदीपिका-केवल्यधाम लोनावला , 2017

5/83, सरस्वती , स्वामी निरंजनानन्द घेरण्ड संहिता योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार 2011

YOGA FOR CHILDREN WITH SPECIAL NEEDS-blog.mygov.in, 30-05-2017

1/1 , पतंजलि योग दर्शन व्यास भाष्य , व्याख्याकार डॉ. सुरेशचन्द्र श्रीवास्तव चोखाम्बा सुरभारती प्रकाशन वाराणसी, 2021

1/17 , स्वामी स्वात्माराम कृत ,हठप्रदीपिका-केवल्यधाम लोनावला , 2017

2/19 , सरस्वती , स्वामी निरंजनानन्द घेरण्ड संहिता योग पब्लिकेशन्स ट्रस्ट मुंगेर बिहार , 2011

https://my-clevelandclinic-org.

Collaborative Artwork approach: Development of Social Communication Skills among Children with Non Verbal Learning Disability

Manshi Negi[1] & Ram Shanker Saxena[2]

Abstract

Nonverbal communication plays an important part of completing our day to day life conversations. Social communication abilities are one of the many skills that children with Non Verbal Learning Disabilities (NVLD) struggle with. They have trouble keeping up appropriate communication with people and deciphering nonverbal cues. The perspectives of special educators regarding the utilization of collaborative artwork activities to improve social communication skills are the main objective of this study. Based on categories including emotional control, social competency, social perception, group skills, and social interaction, four activities were created and modified. Data was gathered online using a Google Form from 80 special educators in the Delhi-NCR region. In survey form, NVLD and its activities were fully explained. The study's findings indicate that, in the opinion of special educators, each of the four activities had a nearly comparable impact on improving the social communication abilities of Children with Non Verbal Learning Disabilities. This study presents special educators' opinions on the effectiveness of collaborative art projects as a means of ingraining social communication skills.

Keywords: Children with Non Verbal Learning Disability, Social communication skills, Collaborative Artwork Activities, Special Educators' perception.

Introduction

Collaborative Artwork Approach

"The artist is a receptacle for emotions that come from all over the place: from the sky, from the earth, from a scrap of paper, from a passing shape, from a spider's web." - Pablo Picasso

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Picasso's well-known quote here captures his idea that artists serve as filters through which the feelings and experiences of the outside world are transferred and subsequently transformed into works of art.

Art is a form of expression that involves, consumes, and elevates the artist; when created collaboratively, the results are multiplied. When more people collaborate on ideas, the results of the artwork become more intense. Both the artist and the work are impacted. Collaborative art projects and social communication abilities are closely related. Over time, there have been gradual changes in art practices from object-based to context-based and, more recently, to artworks that mostly rely on collaboration and participation - often known as socially connected artworks.

As stated by Vygotsky in 1978 that Collaborative artwork approaches draw upon principles of social constructivism, emphasizing the importance of social interaction and shared experiences in learning and development.

Through shared creative processes, collaborative artwork offers young learners an opportunity to hone their problem-solving skills, communication, and ability to collaborate. Children can gain empathy, self-expression, and the ability to collaborate with others to achieve a common objective by participating in cooperative art projects.

Children can interact socially and express themselves creatively in an organized and encouraging environment through collaborative artwork initiatives, which have attracted attention as a way to address issues.

Specific Learning Disability

A learning disability is an array of several conditions that can affect various parts of theneural network of the brain. The functions that are affected and the extent to which the learner feels the effects of these challenges can differ. Unlike many other types of disorders, learning difficulties are sometimes less obvious and more difficult to identify. We are unable to see it, unlike a physical impairment. Aside from difficulties in a particular area of intellectual functioning, children with learning disabilities may not exhibit any symptoms at all. It most likely won't be obvious that a student who is accepting of obstacles has a learning problem.

Children with specific learning disabilities deal with a wide range of complex, interwoven challenges that often go unnoticed or unrecognized but have an impact on their learning Children with unique learning disorders are inconsistent; they are typically portrayed as averagely intelligent individuals who struggle with data handling and haveunforeseen academic problems that cannot be explained by other disabilities that have been examined. In other areas of study and preparation, they exhibit excellence and accomplishment. Even while learning disabilities are ingrained, their effects on a person's life can differ depending on their environment.

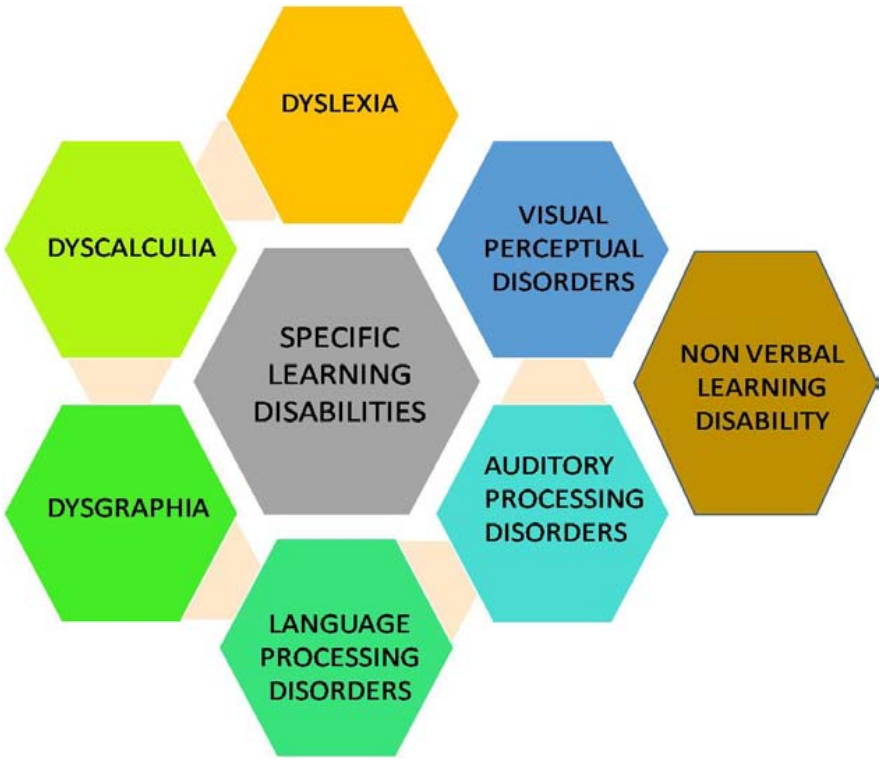

Figure 1: Different Types of Specific Learning Disabilities

Nonverbal Learning Disability

The detailed definition for nonverbal learning disability has been documented by Rourke and his colleagues as follows:

"*Significant primary deficits in some dimensions of tactile perception, visual perception, complex psychomotor skills, and in dealing with novel circumstances..." often leading to tertiary deficits in concept-formation, problem-solving, and hypothesis-testing skills. Finally, these deficits lead to significant difficulties in the content and pragmatics dimensions of language.*

Despite not being categorized into any specific analysis in the DSM-5 or ICD-10, nonverbal learning disability has a strong body of research supporting it.

The pattern of strengths and difficulties associated with nonverbal learning disabilities is believed to be caused by malfunction in the right hemisphere of the brain. Visual information processing abilities rely on simultaneous collection and blending of input from multiple tangible sources and are more particular to the right brain. The brain's right hemisphere malfunctions when it comes to combining so many bits of information into a single integrated image. Different students' exhibit different traits, hence learners with nonverbal learning disabilities may exhibit both subtle and significant traits.

Since it is a neurological issue, it persists throughout life. It is frequently misdiagnosed and misinterpreted. The symptoms of nonverbal learning disabilities are comparable to those of other diseases, including attention deficit hyperactivity disorder, mathematics disorder, and autism spectrum disorder, which makes identification more difficult. It's also important to keep in mind that multiple problems can occur at the same time (comorbidity). Those with nonverbal learning disabilities exhibit lower levels of impulsivity and more difficulties with social and interpersonal skills as compared to those with attention deficit hyperactivity disorder. They struggle more in math and reading comprehension, and they are more prone to experience stress preceding anxiety.

Since nonverbal learning disabilities impact a wide range of regions and resemble other situations, they might be difficult to diagnose. A learner with a nonverbal learning disability faces the following challenges and limitations, explained with examples.

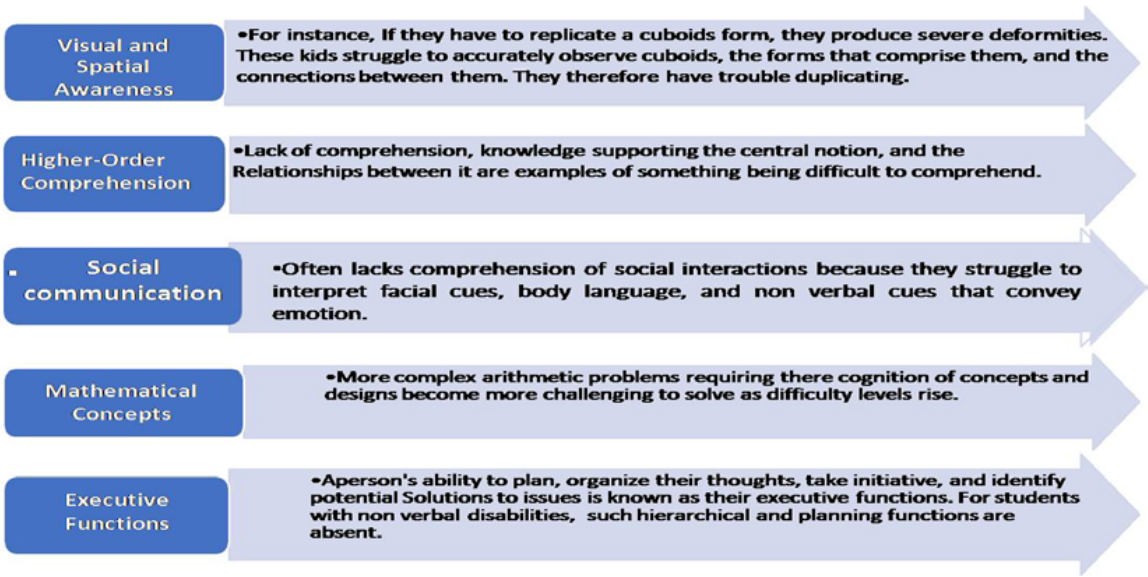

Figure 2: Characteristics of children with nonverbal learning disability.

Social Communication Skills of Children with Nonverbal Learning Disability

When a learner has a nonverbal learning deficit, their verbal functioning shows strong word recognition, vocabulary, and speech production. These students may speak with an abundance of data and details, but because they are usually direct in their speech, it lacks significance. Meaning is acquired from both the words' literal meaning and frequently from a link between visual and written meaning. Simply and concretely keeping their words as discrete parts is insufficient for students with non-verbal learning impairments to create a visual representation. This has an impact on the learner's capacity to comprehend language function more thoroughly and holistically.

In addition, a significant portion of our social and relationship communication depends on our ability to understand what is being said as well as its purpose or significance. Unassuming nonverbal cues are what we rely on to help us interpret the intended

significance. For example, when someone says, "one moment," we understand that they will be with us in a moment. This equals precisely sixty seconds for a student with a nonverbal learning deficit. Learners with nonverbal learning disabilities are also not skilled at replicating nonverbal cues from conversations because they are not able to recognize them. Because of this, their discourse is inappropriate in this context. It restricts them to conversational interaction, satire, sarcasm, and constructive dialogue.

It limits their abilities to observe instances and form connections based on similaritiesand differences. This hinders critical thinking, expectancy, conjecture, revelation learning, experimental learning, knowledge of the situation and its logical outcomes, flexible intuition (adapting to the unknown by relating it to the familiar), and basic reasoning.

Review of Literature

Kato.D (2018) conducted a study 'Improving Social Skills through Collaborative Artwork and Group Activity'. The purpose of the research was to determine how collaborative block construction affected social skills and trust. The study's hypothesis stated that creating blocks together will essentially increase one's social skills, self-confidence, and trust in others.The study's findings demonstrate that cooperative block construction has a significant impact on the social skills and interpersonal trust of the samples. It also suggests that group block building could be useful as a communication tool in educational, therapeutic, and multipurpose gathering environments.

Freilich**.R** (2010) conducted a study 'The contribution of art therapy to the social, emotional, and academic adjustment of children with learning disabilities'. Research determines how art therapy helps children with learning disabilities and evaluates interventions and how they relate to outcomes. The results demonstrate positive outcomes in terms of transformation under art therapy settings and a comparable improvement in terms of academic achievement in both scenarios. The intervention's collaborative art work activities were centered on the development of consciousness and insight and emotional exploration.

Round.A, et al. (2017) conducted a study 'Using Visual Arts to Encourage Children with Autism Spectrum Disorder to Communicate Their Feelings and Emotions'. The experimental study aims to describe the inner and outer lives of two autistic children and the ways in which their art-making influenced their ability to communicate their emotions and feelings. The findings indicate that as the art-making meetings progressed, the social partnership between the researcher and the two individual participants grew. The results suggest that specific art based activities could help teachers and visiting instructors address a sample's behaviour that corresponds with concrete problems, increasing study hall focus.

Rational

Social and organizational skills are the main areas of difficulty for children with nonverbal learning disabilities. Nonetheless, using the arts in their intervention plans

can help them improve their social communication abilities. This study aims to ascertain special educators' perspectives regarding the use of cooperative art projects with kids who have nonverbal learning disabilities. Due to their inability to interpret nonverbal signs and messages, children with nonverbal learning disabilities have significant gaps in their social communication, which has a profound impact on their social and emotional development. They find it more difficult to establish productive connections or to create peers. The purpose of this study is to determine whether or not collaborative art projects may help children with nonverbal learning disabilities improve social communication skills, which in turn can affect their social and emotional development. We learnt about the opinions of many special educators regarding the use of these collaborative strategies as part of an intervention plan for children with nonverbal learning disabilities. Through this program, special educators will learn how to use a variety of techniques and activities to get better outcomes. This study will encourage special educators to use collaborative creative opportunities for the best results and achievements during the intervention phase.

Objectives of the Study

1. To study perception of special educators on using collaborative artwork activities for development of social communication skills among children with non-verbal learning disability.
2. To compare effectiveness of collaborative artwork activities chosen for research for development of social communication skills among children with non-verbal learning disability according to the perception of special educators.

Hypothesis for the Study

1. There will be no significant difference between the effectiveness of collaborative artwork activities chosen for research for development of social communication skills among children with non-verbal learning disability according to the perception of special educators.

Methodology

The study is conducted through survey method of research for the purpose of data collection with the help of questionnaire. Eighty Special educators from Delhi-NCR who are registered with the Central Rehabilitation Register are included in the study. Convenient purposive sample was used.

The study's primary goal is to learn how special educators perceive about the concept of using collaborative artwork as an intervention strategy for children. The researcher has made a questionnaire for survey as a tool. The survey form consist of two sections Part A and Part B. Part A collect information about the demographic details of special educators.

Part B is divided into four sections, each of which contains an activity with eight closed-ended statements in it. For each activity, the special educator must indicate which

alternative is best for helping children with nonverbal learning disabilities develop their social communication skills. The exercises selected for the questionnaire were created and modified by the researcher specifically to help children with nonverbal learning disabilities improve their social communication skills. The following are the four activities to be completed on the questionnaire:

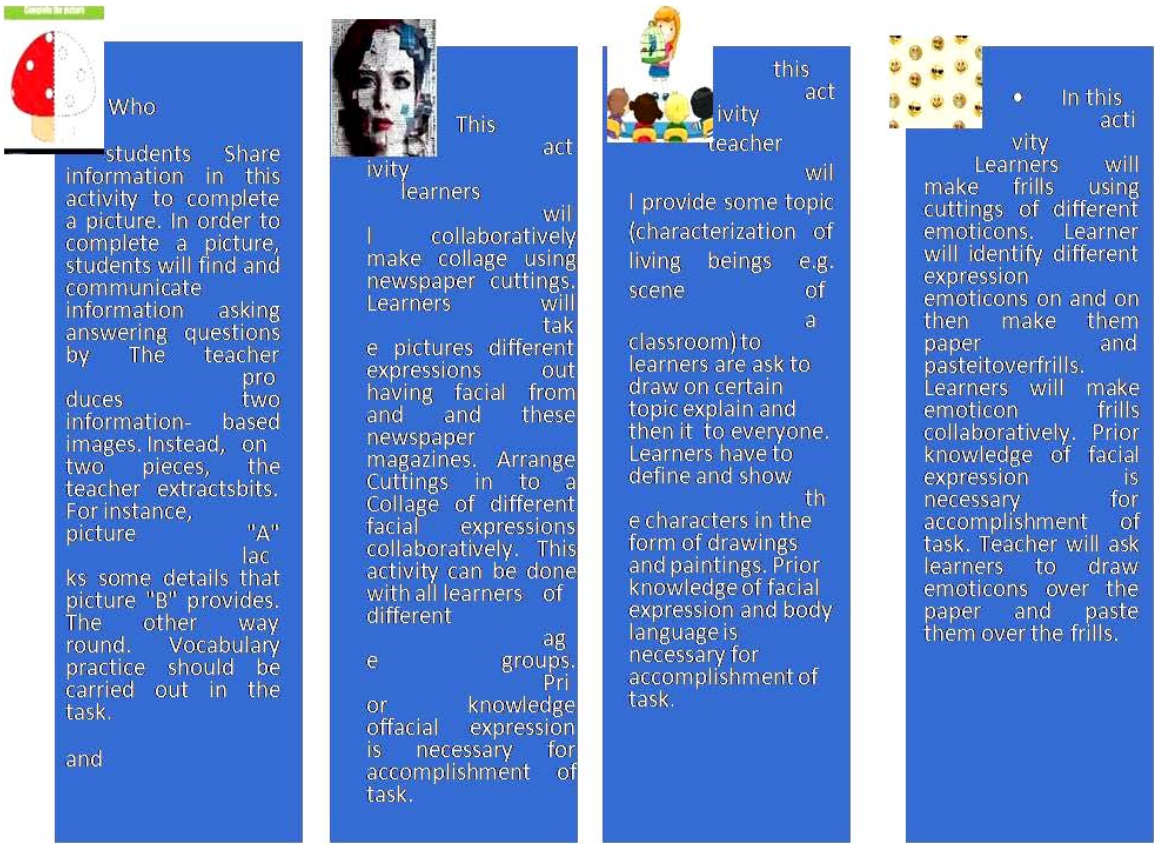

Figure 3: Collaborative Artwork Activities

Data Analysis

The first objective of the study is **"To study perception of special educators on using collaborative artwork activities for development of social communication skills among children with nonverbal learning disability"** for this objective percentage analysis has been done.

A survey questionnaire, comprising four sections and an activity with eight closed-ended statements per activity, was used to perform the study. Thus, there were 32 assertions in total. The study's scoring system was set up as follows: 5 for strongly agree, 4 for agree, 3 for neutral, 2 for disagree, and 1 for strongly disagree. Five was the highest possible score. Thus, the study's total computed score is 160 (32 X 5). After calculating the mean score for all 80 special educators across 32 closed-ended statements, the result was 136.2.

Table 1:Percentage of perception of special educators on using collaborative artwork activities for development of social skills among children with nonverbal learning disability.

Total score of the survey form 160	
Mean score of total scores obtained in data collection	136.2
Percentage of scores of special educators	85.12%

The percentage of mean score of special educator's perception on using collaborative artwork activities for development of social communication skills among children with nonverbal learning disability came out as **85.12%**. This shows that collaborative art work activities chosen for the study can be used for development of social communication skills among children with nonverbal learning disability.

Comparison between effectiveness of collaborative artwork activities on basis of perception of special educators.

Table 2:One way ANOVA of collaborative artwork activities chosen for research for development of social communication skills among children with nonverbal Learning Disability.

Variables	Source of Variation	Square Sum	df	Mean Sum	F value	P value	F critical value
COLLABORATIVE ARTWORK ACTIVITIES	Between Groups	13.4	3	4.46	0.39	0.76	2.63
	Within Groups	3615.8	316	11.44			
	Total	3629.2	319				

The results of ANOVA one way analysis presented in the table 2, shows comparison between the effectiveness of collaborative artwork activities chosen for research for development of social communication skills among children with non-verbal learning disability according to the perception of special educators. The value for f ratio is 0.39 which is less than f critical value i.e. 2.63 (0.39 < 2.63). And the P value (0.76) is also more than 0.05 significance level. The result is not significant as, P value (0.76) > 0.05. Thus, the null hypothesis "There will be no significant difference between the effectiveness of collaborative artwork activities chosen for research for development of social communication skills among children with non-verbal learning disability according to the perception of special educators" is accepted.

Table 3: Mean scores of collaborative artwork activities chosen for research for development of social communication skills among children with nonverbal learning disability.

COLLABORATIVE ARTWORK ACTIVITIES	*Average*
ACTIVITY 1 : COMPLETE THE PICTURE	34.025
ACTIVITY 2: NEWSPAPER COLLAGE	34.225
ACTIVITY 3: SHOW AND TELL	33.725
ACTIVITY 4: EMOTICON FRILLS	34.225

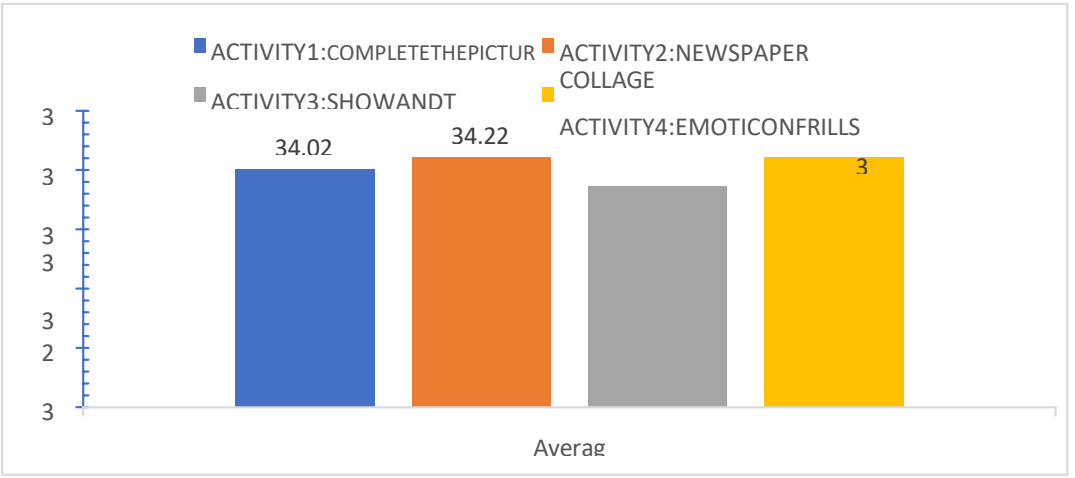

Figure 4: Comparison between Mean scores of collaborative artwork activities chosen for research for development of social communication skills among children with nonverbal learning disability

We can infer that, in the opinion of special educators, there is no discernible difference between the four collaborative art work activities selected for the study based on one way ANOVA analysis of the mean scores of the collaborative artwork activities shown in figure 4. Additionally, special educators believe that all four of these activities are about equally effective in helping children with nonverbal learning disabilities build their social communication skills.

Findings

1. As per the study's findings, the mean score of special educators' perception is 85.12%.This proportion demonstrates special educators' positive perceptions of the study and their acceptance of the notion that the cooperative art projects selected for the study can be used to help kids with nonverbal learning disabilities improve

their social communication skills.

2. Special educators believe that all four activities can produce results that are comparable. Based on the results, we may infer that this study supports the use of collaborative artwork activities. The utilization of cooperative art projects to foster social communication skills in children with special needs, particularly those with nonverbal learning disabilities, has the potential to provide significant outcomes.

Conclusion

Implementing collaborative artwork interventions successfully requires thorough planning, unambiguous directions, and social skill scaffolding. Through collaborative artwork, learners can explore diverse viewpoints, resolve conflicts, and get a more profound comprehension of interpersonal connections. Children can improve their theory of mind skills and experience taking perspectives through cooperative art projects. Children can express their ideas, emotions, and experiences nonverbally through artistic expression. Children with NVLD can express themselves creatively through collaborative art projects, which can help them learn how to identify and control their emotions in a conducive environment.

Children can be encouraged to collaborate through collaborative artwork, which promotes cooperation, teamwork, and peer support. Children with NVLD can create social connections and healthy interactions with their peers by taking part in group art projects. Collaborative art activities have the potential to enhance children's self-esteem, competence, and sense of accomplishment. Children with nonverbal learning disabilities (NVLD) may benefit from enhanced self-efficacy and self-esteem when they effectively work with others.

Refrences

American Psychiatric Association (2013). Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. *American Psychiatric publication* (Washington, DC). Retrieved fromhttps://cdn.websiteeditor.net/30f11123991548a0af70872 2d458e476/files/uploaded /DSM%2 520V.pdf

Freilich, R., Shechtman, Z. (2010). The contribution of art therapy to the social, emotional, and academic adjustment of children with learning disabilities. *The Art in Psychotherapy*. *37*(2), 97-105. Retrieved from https://www.sciencedirect.com/science/article/abs/pii/S0197455610000201

Kato, D. (2018) Effects of collaborative block creation on social skills and trust. *Socialization - A Multidimensional Perspective*. Chapter 3. Retrieved from https://www.researchgate.net/publication/325879788_Improving_Social_Skills_th rough_Collaborative_Artwork_and_Group_Activity

Rawley, A., Silver. (1975). Using art to evaluate and develop cognitive skills' children with communication disorders and children with learning disabilities. *American Art Therapy Association*. Retrieved from https://files.eric.ed.gov/fulltext/ED116401.pdf

Rehabilitation council of India. (n.d.). Learning Disabilities. *RCI Book*. Retrieved from http://www.rehabcouncil.nic.in/writereaddata/ld.pdf

Round, A., Baker, W.C., Rayner, C. (2017) .Using Visual Arts to Encourage Children with Autism Spectrum Disorder to Communicate Their Feelings and Emotions. *Open Journal of Social Sciences .5*(10). DOI: 10.4236/jss.2017.510009. Retrieved from https://www.scirp.org/journal/PaperInformation.aspx?paperID=79586&

Social Perception. (2013).Neural Circuit Development and Function in the Brain. Retrieved from https://www.sciencedirect.com/topics/neuroscience/social-perception Thompson, S. (1996). Nonverbal learning disorders. *LD Online.* Retrieved from http://www.ldonline.org/article/6114/Understanding Learning Disabilities. (n.d.). Module 1. (1-2) Retrieved from https://www.edu.gov.mb.ca/k12/docs/support/learn_disabilities/module1.pdf Your Child Development & Behaviour Resources. (n.d.). Non-verbal Learning Disability (NLD or NVLD)Retrieved from http://www.med.umich.edu/ yourchild /topics/ nld .htm

Brenchley, C. (May 2018). A model of assessment and intervention for Non-Verbal Learning Disability (NVLD) in the Australian education system: an educational and developmental psychologist perspective. *Australian Journal of Learning Difficulties* (Monash University). Retrieved from https://www.tandfonline.com/doi/abs /10.1080/19404158.2018.1467936

A Study on the Transition of Individuals with Intellectual Disability from School to Post-School

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Abstract

This study addresses the transition phase of individuals with Intellectual Disability (ID) from school to post-school life in India, specifically focusing on their vocational transition. The research stems from the recognition of unique challenges faced by individuals with Intellectual Disability during this transition, as well as to understand their nuanced experiences. Through a Descriptive Survey methodology, a sample of 102 intellectually disabled individuals in the NCR region were studied. The study contributes to a deeper understanding of the multifaceted issues surrounding the vocational transition of individuals with Intellectual Disabilities in India, emphasizing the need for tailored support mechanisms and gender-sensitive approaches to enhance successful post-school transition.

Keywords: Intellectual Disability, Job Satisfaction, Adjustment, Transition, and School to Post-School

Introduction

Transition refers to the process or period of shifting from one state or condition to another, such as when students move from one program to the next. The School-to-Post-School system incorporates both school-based and work-based education, linking activities from as early as kindergarten to introduce students to possible future careers. This approach emphasizes lifelong learning, recognizing that work is a key part of adult life, often occupying about half of our waking hours. People frequently define themselves by their work, which can bring a sense of accomplishment and pride, contributing to life satisfaction—or, in some cases, lead to frustration and dissatisfaction. Identifying the right job, or even discovering what that might be, is challenging for everyone and can be particularly difficult for those lacking training or facing unique challenges, such as disabilities.

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Studies show that about 66% of working adults never had a defined career plan; instead, they entered their current roles due to chance, external influences, or limited job options.

The Rights of Persons with Disabilities Act of 2016 defines "intellectual disability" as a condition marked by notable limitations in intellectual functioning—such as reasoning, learning, and problem-solving—as well as adaptive behavior, which includes everyday social and practical skills. Within this definition:

a) "Specific learning disability" includes a range of conditions involving difficulty processing language (spoken or written), affecting comprehension, speaking, reading, writing, spelling, or mathematical abilities. These conditions encompass perceptual disabilities, dyslexia, dysgraphia, dyscalculia, dyspraxia, and developmental aphasia.
b) "Autism Spectrum Disorder" is described as a neurodevelopmental condition that typically emerges within the first three years of life. It significantly impacts an individual's ability to communicate, understand relationships, and connect with others and is often associated with unique or repetitive behaviors.

Need of the Study

Transition refers to basically moving from one situation to another. Transition in education means that a student moves from one level of education to another (i.e. primary to secondary, secondary to pre-vocational). Similarly, the vocational transition means that after completing school, adults with Intellectual Disabilities enter a vocation or profession. Studies show that Intellectual Disabilities have limited intellectual functioning and adaptive behaviour. Therefore, they face problems in vocational transition. It is difficult for them to move from one level of education to another level. But to some extent, vocational transition is happening in India. Some work has been done around vocational transition. However, there is no study which has been done on the vocational transition of Students with Intellectual Disabilities in India. Hence, the present study has been undertaken.

Post-school outcomes for individuals with disabilities have seen limited change over the years, with low expectations often set for them in terms of meaningful employment, independent living, self-satisfaction, and social engagement. As teachers of students with intellectual disabilities, it is our responsibility to take the necessary steps to fully prepare these students for fulfilling lives after they leave school.

Family involvement is crucial in transition planning and can significantly improve a student's post-school outcomes. Even small contributions from families to a child’s education have been shown to have positive effects. In addition to parents, extended family members, especially siblings, play an important role in planning for the student’s future, particularly in times when parents may no longer be available to provide support.

Individuals with intellectual disabilities often lack opportunities to practice self-determination skills in real-world situations, contributing to poor post-school outcomes. The emphasis on post-school outcomes is often so heavily focused on employment that the importance of social life for individuals with severe disabilities can be overlooked.

Statement of the Problem

Individuals with Intellectual Disability (ID) encounter unique challenges during the transition from school to post-school life in India. Despite increasing efforts towards inclusivity, there is a significant gap in comprehending the nuanced experiences of this population. This study seeks to address this gap by investigating the transition process, profiling individuals with Intellectual Disability, and examining their job satisfaction and adjustment in vocational setups. The research will also discuss the profiles of Individuals with Intellectual Disability engaged in vocational settings. This study seeks to enhance understanding of the complex issues involved in the transition process for individuals with intellectual disabilities by exploring these various aspects in depth in the Indian context and is titled **A Study on Transition of Students with Intellectual Disability from School to Post-School.**

Research Questions

1. What are the Profiles of Individuals with Intellectual Disability working in vocational Setups?
2. How satisfied are Individuals with Intellectual Disability with their work in vocational setups?
3. How they are adjusting to their work environment in the vocational setups.
4. What insights and lessons can be derived from the profiles of Individuals with Intellectual Disability working in vocational setups?

Objectives of the Study

1. To study the profiles of Individuals with Intellectual Disability working in vocational setups.
2. To study the job satisfaction of Individuals with Intellectual Disability working in vocational setups.
3. To study the adjustment of Individuals with Intellectual Disability working in vocational setups.
4. To discuss selected profiles of Individuals with Intellectual Disability working in vocational setups.

Methodology

The primary objective of the study is to study on transition of Students with Intellectual Disabilities from School to Post School. The sample used for the study was one hundred two Individuals with Intellectual Disabilities who are working in various vocations at NCR region. The research design used in this study is the Survey method. The sample was

chosen using a non-probability sampling method. In this approach, Purposive sampling has been used because the researcher selected all the possible cases that fit the criteria in the study and for a specific purpose i.e., for collecting data on the transition of Students with Intellectual Disabilities from School to Post School.

In this study, the researcher has developed a "Scale" to find out Job satisfaction and adjustment. The developed Scale consists of questions for collecting the level of job satisfaction of Individuals with Intellectual Disabilities in their vocational settings. It consists of 5 domains with 25 items in the domains. Similarly, the adjustment scale consists of questions for collecting the level of adjustment of Individuals with Intellectual Disabilities working in vocational set-ups. The responses of the subjects were recorded.

Statistical Techniques

For data to be meaningful, it must undergo careful editing, systematic classification, tabulation, scientific analysis, thoughtful interpretation, and logical conclusion. In this study, percentages were used to analyze the data, and a few selected profiles were also discussed.

Delimitation of the Study

The present study is subject to the following delimitations.

1. The present study is delimited to only students with intellectual disability.
2. The Present study is confined to Individuals with mild and moderate Intellectual Disability.
3. The present study is delimited to vocational setups.
4. The Present study is confined to the NCR region.
5. The Present study is confined to urban areas.

Major Findings of the Study

Objective 1 To study the profiles of Individuals with Intellectual Disability working in vocational setups.

1. It is found that the highest proportion of respondents belongs to the 21-30 age group, constituting 41.2% of the sample. The <=20 age group followed closely, comprising 28.4% of the respondents. The percentage of respondents gradually decreased with an increase in age, with the >50 age group having the smallest representation of 3.9%.
2. The data was further analysed based on gender. Notably, the 21-30 age group had a higher proportion of males (42.9%) when compared to females (37.5%). In contrast, the <=20 age group had a higher percentage of males (31.4%) when compared to females (21.9%).

3. The data illustrates a diverse range of educational backgrounds within the sample. The majority of participants fall into the "Elementary" category, comprising 36.3% of the sample. On the other hand, "Vocational" participants also form a substantial portion, representing 35.3%. This suggests a varied educational profile, including mainstream and special educational backgrounds.
4. The data shows different educational backgrounds within the sample. Notably, a higher percentage of males fall into the "Vocational" category (40%) compared to females (25%). Conversely, a higher percentage of females represent the "Elementary" (40.5%) and "Secondary" (25.1%) categories compared to males. It is crucial to consider gender-specific educational trends for a more nuanced understanding of educational backgrounds.
2. It is found that most respondents identified themselves as "Worker," constituting 90.2% of the respondents. Conversely, the "Helper" category comprised 9.8% of the respondents. These findings indicate that a predominant representation of individuals is in the worker category.
3. The distribution is further analysed based on gender. Notably, most of the respondents, male (88.6%) and female (93.8%) identified themselves as "Workers." In the "Helper" category, a small percentage of females (6.3%) identified themselves as helpers compared to males (11.4%).
4. It is found that most of them reported as "Average" socio-economic status, comprising 83.3% of the respondents. Conversely, a smaller proportion is into the "Below Average" (7.8%) and "Above Average" (8.8%) categories. These findings suggest a predominant representation of individuals with an average socio-economic status within the sample.
5. The data was further analysed based on gender. Notably, in the "Below Average" category, the percentage of males (5.7%) and females (12.5%) were relatively same. In the "Above Average" category, there was a notable difference, with a higher percentage of females (11.4%) when compared to males (3.1%).
6. It is found that most of the respondents reported as "Sheltered" employment, constituting 95.1% of the total sample. A smaller proportion of the participants were engaged in "Supported Employment" (2.9%) and open employment (2.9%).
7. The results revealed that type of employment and gender, notably, in "Sheltered" employment, the percentage of males (94.3%) and females (96.9%) were almost same. In the "Open Employment," both males and females have a similar representation, with 2.9% of males and 3.1% of females. It's important to note that there was no female respondent in the "Supported" employment category.

Objective 2 To study the job satisfaction of Individuals with Intellectual Disability working in vocational setups.

1. It is found that workplace satisfaction appears to be satisfactory, with a favorable attitude towards co-workers and clarity on job responsibilities, but the workplace location is a concern for some respondents.
2. It is found that satisfied with the supervisor's fairness, safety, and working hours but somewhat dissatisfied with the facilities like the canteen and transport.
3. It is found that they feel their work is appreciated, and career opportunities are satisfactory. They have issues with salary, medical benefits, and opportunities for extra income.
4. It is found that there is a friendly relationship among the workers, but some of them do not interact much with others.
5. It is found that they enjoy their co-workers' company and their helpfulness, but some of them are not concerned with the employees' problems.

Objective 3 To study the adjustment of Individuals with Intellectual Disability working in vocational setups.

1. It is found that they are open to communication, adherence to instructions, and mutual help among co-workers indicating a positive work culture.
2. It is found that there is a low incidence of teasing, and feeling motivated but few expressed a preference for working in isolation.
3. It is found that they have good levels of spatial awareness, grip strength, and walking abilities with some variations among individuals but some may experience challenges in specific physical tasks.
4. It is found that they maintain decorum at the workplace and most of them can classify objects. However, there are variations in individuals' abilities to recall things and preferences.
5. It is found that they can sit in one place and finish work on time. However, there are individual variations, including misplacing things, making careless mistakes, challenges in time management, and focusing on tasks.

Objective 4 To discuss selected profiles of Individuals with Intellectual Disability working in vocational setups.

The collective narratives of individuals with intellectual disabilities, as showcased in the presented profiles, paint a compelling picture of triumph over adversity, determination, and the transformative power of support and opportunities. Everyone, from **Harish Vij's** exceptional journey in the hospitality industry to **Shrey Kadians** remarkable achievements in sports and education, and **Harsh Bhardwaj's** transformative path from overcoming challenges to contributing significantly as a data entry operator, represents a unique story of resilience and success.

Kunal's story, emerging as a testament to the inclusive possibilities within sheltered workshops, and **Sagar's** inspirational journey of pursuing education and vocational training, challenge societal norms, demonstrating that individuals with intellectual disabilities can lead fulfilling lives and contribute meaningfully to society.

Shagun Bhola, Dhruv Malhotra, and Amit Sikka exemplify the potential for socioeconomic independence and meaningful contributions to the workforce, emphasizing the importance of inclusive work environments.

Tanya Bhutanis tale of independence and self-determination, working as a receptionist, showcases the inclusivity of workplaces valuing a diverse range of skills.

Souham Debs resilience and pursuit of education, transitioning into open employment as an assistant teacher, serve as a beacon of hope, dispelling myths and inspiring others facing similar challenges.

In conclusion, these stories collectively challenge stereotypes, highlight the importance of inclusive environments, and underscore the undeniable potential of Individuals with Intellectual Disability. These individuals not only navigate their unique challenges but also actively contribute to diverse sectors, fostering a society defined by acceptance, variety, and equal opportunity for all. The narratives call on society to recognize, nurture, and provide opportunities for individuals with intellectual disabilities, fostering a more compassionate and Inclusive world.

Discussion

The study's findings are supported by Akkerman, P. et al. (2016), who reviewed existing research on job satisfaction among individuals with intellectual disabilities in both integrated and sheltered employment settings, along with related factors. Through a systematic and comprehensive literature review, they found that individuals with intellectual disabilities generally reported satisfaction with their jobs in both types of employment environments. The higher job satisfaction among females may indicate shifts in dynamics or improvements in workplace conditions for women.

The findings suggest a predominantly positive work environment, with strengths in relationships, job clarity, and satisfaction with supervisors. However, there are clear areas that require attention and improvement. Addressing the concerns about workplace location, facilities, salary, and benefits is crucial to enhance overall satisfaction and retain talented employees. Additionally, efforts can be made to encourage more interaction among team members and promote a culture of empathy and support. Regular feedback mechanisms and open communication channels can play a vital role in understanding employee needs and addressing issues promptly.

In conclusion, a balanced approach that acknowledges and builds on the positive aspects while actively addressing the identified concerns will contribute to a more robust and satisfying workplace for all employees**.**

Implications of the Study

This study has several positive responses which have direct relevance to those who are running vocational centres in training Individuals with Intellectual Disabilities in different vocational skills. The findings of this study have the following educational implications.

- Results of this study may be helpful to parents, professionals, and job providers in the public sector and private sector.
- These results can inform the development of rehabilitation, education, and employment programs for individuals with intellectual disabilities, providing them with opportunities to work in the open labor market and engage more fully in society.
- Vocational training Institutions should update Vocational guidance, vocational training, placement, and the development of employment opportunities for Individuals with disabilities to ensure that they are aware of their needs relating to Employment.
- Promote access to persons with disabilities in education, skill development, and life-long learning.
- Individuals with Intellectual Disabilities can identify their needs and abilities, and their Perspectives must be considered in decisions regarding their employment situation.
- The services or facilities for imparting training and placement have increased in recent years. Several voluntary organizations and Government agencies initiated employment-oriented schemes for the welfare of Individuals with Intellectual Disabilities; this outcome of the study will create awareness in the public as well as businesspeople.

SUGGESTION FOR FURTHER RESEARCH

This study revealed to study the transition of students with intellectual disability from school to post-school. Based on findings obtained in this study a few research questions are apparent. The following are suggestions for future research:

- This study was conducted on Intellectual Disability. Further, studies need to be conducted on persons with disabilities.
- Only two severity levels of Individuals with ID (Mild and Moderate) have taken samples in this study. All severity levels of Intellectual Disability can be included to find out whether it produces similar effects.
- This study was conducted only in urban areas, a comparative study on the employment opportunities in rural and urban areas can be conducted to understand the different environments and opinions regarding employment opportunities.
- The study is limited to the NCR region. Further, a study can be extended to other regions also.

- After reviewing the literature on the same by other researchers, the researcher found that the studies in the area of Employment Readiness among Individuals with Intellectual Disabilities are limited in India. So, there is a need to conduct more research in this area.
- This study is conducted for a smaller group (sample size) with a shorter duration. Therefore, there is a scope to conduct a study for a larger group with a longer duration like qualitative studies.
- More studies can be conducted on the Employment of Individuals with Intellectual Disability with open-ended questionnaires to collect opinions of Individuals with Intellectual Disabilities towards employment for finding in-depth or comprehensive interests.
- This study revealed that Individuals with Intellectual Disabilities expressed their Perspectives on job satisfaction and adjustment after completing vocational training. Therefore, more importance must be given to their opinion and provide them with more chances to express their opinion like foreign countries.

Conclusion

The study provides valuable insights into the profiles, job satisfaction, and adjustment of individuals with intellectual disability in vocational setups. Findings highlight the importance of tailored support, future research, and intervention programs in India, considering age, Educational qualification, gender, type of employment, and individual needs. The in-depth profiles contribute to the overall understanding of participants' experiences which recommends promoting an inclusive and supportive work environment for individuals with intellectual disability.

References

Akkerman, A. (2017). Job satisfaction of people with intellectual disabilities: The role of basic psychological need fulfilment and workplace participation. Disability and Rehabilitation.

Akkerman, P., et al. (2016). Job satisfaction of people with intellectual disabilities in integrated and sheltered employment: An exploration of literature. Journal of Policy and Practice in Intellectual Disabilities, 13(3), 205–216. doi: 10.1111/jppi.12168.

Babu, D.C., et al. (2018). Job satisfaction among women special educators of children with intellectual disability. Global Journal for Research Analysis, 7(2), February 2018.

Deepthi DP, Jeyavel S, Subhasree G, and Jojo CE (2022). Proactive coping and social-emotional adjustment among students with and without learning disabilities in Kerala, India. Frontiers in Psychology, 13, 949708. doi: 10.3389/fpsyg.2022.949708.

Foley, K.R., et al. (2012). Young adults with intellectual disabilities transitioning from school to post-school: A literature review framed within the ICF. Disability & Rehabilitation, 34(20), 1747–1764

Gupta, M., & Mehtani, D. (2017). Adjustment among secondary school students: A comparative study based on academic achievement and gender. Bhartiyam International Journal of Education & Research, Quarterly Peer Reviewed.

Jahrami, H. (2014). Job Satisfaction of Staff Working with Individuals with Intellectual Disabilities in Two Different Settings. Bahrain Medical Bulletin, Vol. 36, No. 2, June 2014.

Kocman, A., & Weber, G. (2018). Concepts of job satisfaction in people with intellectual disability. Journal of Intellectual Disability Research Volume 62 part 9 pp 814–819 September 2018. Doi: 10.1111/jir.12534.

Lindstrom, L., et al. (2007). Transition to Employment: Role of the Family in Career Development. Council for Exceptional Children Vol 73. No. 3, pp. 348-366.

Mandy, W., et al. (2016). The transition from primary to secondary school in mainstream education for children with autism spectrum disorder. SAGE Vol. 20(1) 5 –13 DOI: 10.1177/1362361314562616.

Mary Rogers and Peter Creed (2002). School-To-Work Transition: From Theory to Practice. Australian journal of career development 9(3) published by Australian council for educational research.

Maureen, W., John, A., and Ayere, A.M. (2011). The Relationship among School Adjustment, Gender, and Academic Achievement amongst Secondary School Students in Kisumu District Kenya. Journal of Emerging Trends in Educational Research and Policy Studies, 2(6), 493-497.

Meininger, P., et al. (2018). Job Satisfaction of People with Intellectual Disability: Associations with Job Characteristics and Personality. American Journal on Intellectual and Developmental Disabilities. Vol. 123, No. 1, 17–32.

Neubert, A.D. (2001). Post-secondary educational practices for individuals with mental retardation and other significant disabilities: A review of the literature. Journal of Vocational Rehabilitation 16 (2001) 155–168.

Nuske, J. H., et al. (2018). Broken bridges—new school transitions for students with autism spectrum disorder: A systematic review on difficulties and strategies for success. Autism SAGE publication pp-1-20 DOI: 10.1177/1362361318754529.

Romeo, M., et al. (2020). Job Satisfaction and Turnover Intention Among People with Disabilities Working in Special Employment Centers: The Moderation Effect of Organizational Commitment. Front. Psychol. 11:1035.

Thressiakutty, A.T., & Govinda Rao, L. (2001). Transition of Persons with Mental Retardation from School to Work-A Guide. Published by National Institute for the Mentally Handicapped printed by Sree Ramana Process Pvt. Ltd., Secunderabad.

Thressiakutty, A.T., & Govinda Rao, L. (2003). Curriculum for vocational Education-Transition of Persons with Mental Retardation from School to work- Series-2. Published by National Institute for the Mentally Handicapped printed by Sree Ramana Process Pvt. Ltd., Secunderabad.

Children with Specific Learning Disabilities and Peer Buddy Systems: an Effective Educational Intervention to promote Learning Opportunities and Social Relationships in an Inclusive Classroom

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Abstract

The very essence of an inclusive learning is to cater to the educational needs of all students regardless of their varying learning styles and patterns, this not only helps in ensuring holistic developments for our students but also promotes strong relationship building opportunities among both neurotypical and neurodivergent students. After all, in its simplest terms inclusion does mean equal opportunity and participation for all & with all. With regards to children with Dyslexia, Dyscalculia, Dysgraphia or any other learning disability, it gets very hard for them to gel up with their peers in the class, this could be due to many factors like feeling of incompetency, lack of self esteem, poor social interaction skills, etc. which hinders their social participation inside and outside the classroom. The objective of this paper is to explore the effectiveness of buddy systems as an educational approach to promote social inclusion and academic assistance via peer support in an inclusive classroom set up. For this study, the author reviewed numerous journals, research articles, blogs, research papers, newspapers, along with their own observations and understanding regarding the merits of buddy system for a child with specific learning disability. Buddy system is an excellent strategy to promote learning and social interaction among students not only inside the classroom or school premises but also during other important events that do not significantly involve the academic area, it is recommended that such a strategy should be put into use more often since it also sensitizes and creates awareness among neurotypical students to assist and respect students with special needs.

Keywords: Specific Learning Disability, Peer Buddy Systems, Inclusive Education, Teaching Strategies, Educational Intervention, Inclusive Classroom, etc.

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Introduction

Curriculum Transaction for Children with Special Needs

"Children with special needs" is a broad term that encompasses a diverse group of individuals who require additional support or accommodations due to physical, developmental, behavioural, or emotional challenges. Support for children with special needs often involves a multidisciplinary approach that may include educators, therapists, medical professionals, and family members working together to address the child's individual needs and promote their overall well-being and development.

This may include specialized instruction, therapy (such as speech therapy, occupational therapy, or physical therapy), assistive technologies, behavioural interventions, and accommodations in educational settings.

It's important for society to foster inclusivity and provide access to resources and services that support the full participation and integration of children with special needs in various aspects of life, including education, recreation, and community activities. Emphasizing empathy, understanding, and acceptance can help create a more supportive environment for children with special needs and their families.

Children with Specific Learning Disabilities (SLD)

Children with specific learning disabilities (SLD) experience difficulties in one or more academic areas despite having average or above-average intelligence. These disabilities affect how they receive, process, or express information.

It's important for children with specific learning disabilities to receive early intervention and appropriate support to help them succeed academically and develop coping strategies to overcome their challenges.

This may include specialized instruction, accommodations, and assistive technologies tailored to their individual needs. Additionally, fostering a supportive and understanding environment at home and at school can greatly benefit children with SLDs.

Buddy System to support Inclusive Education

The "buddy system" is a strategy or approach often used in various contexts to pair individuals together for mutual support, assistance, or companionship. It's commonly employed in educational settings, outdoor activities, workplace environments, and social groups.

The basic idea behind the buddy system is to ensure that individuals have someone looking out for them and vice versa, fostering a sense of safety, accountability, and camaraderie.

Here are some potential advantages:

Academic Support: Buddies can provide peer assistance with academic tasks, such as reading together, practicing spelling, or solving math problems. This one-on-one support

can be particularly beneficial for children with SLD who may benefit from alternative explanations or additional practice.

Increased Confidence: Having a buddy who offers encouragement and support can boost the confidence of children with SLD. Knowing they have someone to turn to for help can alleviate anxiety about academic challenges and foster a positive attitude toward learning.

Enhanced Social Skills: The buddy system promotes social interaction and cooperation between children with SLD and their peers. Working collaboratively on academic tasks can improve communication skills, cooperation, and the ability to work effectively in a team.

Peer-Modelling: Buddies can serve as positive role models for children with SLD, demonstrating effective learning strategies, problem-solving techniques, and study habits. Observing their peers' approach to learning can help children with SLD develop their own strategies for success.

Emotional Support: Buddies can provide emotional support and understanding to children with SLD, helping them navigate challenges and cope with frustrations. Building a supportive relationship with a peer can contribute to a sense of belonging and reduce feelings of isolation or inadequacy.

Increased Engagement: Working with a buddy can make learning more engaging and enjoyable for children with SLD. Activities that might feel daunting or overwhelming when approached alone can become more manageable and enjoyable when shared with a supportive peer.

Promotion of Inclusion: The buddy system promotes inclusivity by fostering relationships between children with SLD and their peers without disabilities. This can help reduce stigma and promote acceptance and understanding among all students.

Improved Problem-Solving Skills: Collaborating with a buddy encourages children with SLD to engage in discussions, share ideas, and explore different approaches to problem-solving. This can help them develop critical thinking skills and become more adept at finding solutions to academic challenges.

Activities to incorporate Buddy System as an Intervention Strategy

Incorporating the buddy system for children with specific learning disabilities (SLD) can offer a range of benefits that support their academic, social, and emotional development.

Here are some common examples of the buddy system in different contexts:

Outdoor Activities: In outdoor recreation and adventure programs such as hiking, camping, or scuba diving, participants are often paired up as buddies. Each person is responsible for their buddy's well-being and safety, including checking equipment, staying together on trails, and providing assistance if needed.

Swimming: In swimming lessons or water-based activities, especially for young children, the buddy system pairs swimmers together to ensure that no one is left unsupervised in the water. Buddies can help each other stay safe and provide support while practicing swimming skills.

School: The buddy system is sometimes used in schools to pair older students with younger ones, particularly during transitions such as starting kindergarten or moving to a new school. The older student acts as a mentor or guide, helping the younger student adjust to the new environment and providing support as needed.

Workplace Safety: In industrial or hazardous work environments, the buddy system is used to ensure that workers have someone to assist them in case of emergencies. Buddies may conduct safety checks, monitor each other's work, and provide assistance in case of accidents or injuries.

Fitness: In fitness programs or gym settings, individuals may use the buddy system to motivate each other, set fitness goals together, and provide accountability for sticking to exercise routines. Having a workout buddy can increase motivation and make exercising more enjoyable.

Overall, the buddy system is a practical and effective way to promote teamwork, safety, and social connection in various settings. It encourages individuals to look out for each other, fosters a sense of responsibility, and can enhance the overall experience of participating in activities or achieving goals together.

Review of Literature

Mukherjee (2024) in her article on the significance of buddy system for children with special needs in the inclusive setup mentioned about the duties of a buddy, which is to help the student with special needs in their academic, social & recreational domains and even during other events or playtime. This also instils values such as team work, conflict resolution, etc apart from textbooks and curriculums which in turn helps the teacher to nurture the child’s emotional self. The article also mentioned that buddy system facilitates cognitive learning and also develops emotional bonding and attachment with their peers in the classroom. The author concluded that buddy systems is a great opportunity for both students with and without special needs and is a great tool for teacher as well to teach out of the box.

Qandle (2024) in their online article describes how buddy system promotes safety, skill development, collaboration and social integration of students with special needs in various contexts while sharing experiences, knowledge and experiences to achieve common goals. The buddies, in this context the students with special needs and without special needs, work closely together while working in pairs either in a temporary or long term practice depending on the specific context.

Hawkins (2023) conducted a review based study on the effective inclusive strategies for students with disabilities as guides for general education teachers. The study aimed at providing new effective and strategic ways to reach each student which is the most

significant challenge in making of a inclusive classroom. From the literary review the authors concluded that the buddy system is indeed a supportive method for not only the special needs students but also the general education students and teachers, since it helps in lowering the burden for the classroom teacher while the general education students take on the role of assistant teacher or mentor for their respective peers in the classroom activities and assignments. The authors also suggested that with guided implementation and collaboration between administrators, teachers, students and parents this system will ensure quality education for children with special needs.

Jain (2023) maintained an article on the use of buddy systems in inclusive education to promote social inclusion and academic success through per support for students with disabilities. The article mentioned that buddy system is a supportive practice wherein pairing of students with special needs and typically developing peers takes place in an inclusive classroom setup. The author suggested that implementation of the buddy system calls for careful training, planning and ongoing support from both special and general educators along with other professionals and the school administration. This also fosters the need to set clear expectations and monitor the dynamics between the buddies/peers with the opportunities for feedback and reflection for the successful implementation of inclusive education.

Singh (2023) in her article on the buddy system as a supportive solution for new students explained about the various benefits of this strategy that turned out to be a game changer in effectively enhancing social and emotional support network for students within the school. Few of the aforementioned benefits are support & guidance from their buddies to make classroom transitions smoother and less overwhelming, enhanced social connections thereby promoting a positive and inclusive learning environment, reduced isolation as students finally have someone to rely on and confide in, conflict resolution since buddies address and resolve conflicts and create a harmonious atmosphere and improved emotional wellbeing as they feel cared and valued by their peers.

Robbles (2022) in her article on the use of buddy program to foster social emotional learning (SEL) talks about the challenge of lack of exposure to peers during their critical learning period. The article discusses that buddy program is an effective way to encourage a positive and sibling-like relationship between the respective students that harnesses social and emotional learning. The author recounted her own observations while using this strategy with the middle school students that resulted in helping bring the students closer to each other.

Dobres & Posada (2021) in their article on reverse inclusion and the use of peer buddies to teach skills in a public school setting explored the significance of peer buddy programs to help bridge the gap between young neuro-typical and neuro-diverse students by training them on how to interact with each other along with equipping them better social skills in a special educational setting. The basic fundamental of this strategy was to incorporate neuro-typical students in a special educational set up. The authors countered numerous benefits of buddy programs such as increased social

confidence in students with disabilities within the presence of their neurotypical peers along with development of empathy and patience in them. This overall helps the teacher to make the classroom a more natural, encouraging and supportive teaching-learning environment.

Significance of the Study

For children with special needs, it could be a challenge to reciprocate their feelings to others or forming friendships with their peers. For children with learning disabilities it becomes even worse, due to the hidden or invisible nature of their disability, making them more vulnerable to challenges like bullying, peer pressure, feeling unwanted or like an outcast, extreme nervousness, prone to anxiety and in some cases even depression and much more.

Thus it becomes of utmost importance to provide a safe learning environment with enriching experience in not only the scholastic areas but also with activities that promote team building exercises, collaboration between peers, utilisation of multiple intelligence and other skills, providing equal opportunities and participation that will ensure holistic learning of the students.

Objective of the Study

This study aims to explore the benefits and significance of incorporating a buddy system in an inclusive classroom, that not only assists children with special needs in their classroom activities but also help them build social relationships that are not confined to academic responsibilities.

Moreover, the paper will also emphasize how assigning neurotypical students as 'Buddies' can provide them opportunities for experiential learning also while promoting an inclusive environment.

Methodology of the Study

For the present study review of relevant literature has been mentioned. The author carried out a thorough examination of a myriad of research articles, academic journals and authoritative blogs to comprehend the existing knowledge related to subject field.

The goal of this literary review was to derive and enumerate the research objectives to ensure a well grounded foundation for the study. The review encompassed a varied range of scholarly sources, including peer-reviewed research articles, renowned academic journals, and authoritative blogs.

Findings

The literary review presented many great examples and strategies for incorporating buddy system into our classrooms, however there are very few teachers who actually implement this technique in their classroom due to which the true of potential of assigning buddies to children with special needs, especially students with learning disabilities or difficulties, has not yet been explored fully.

This is because of one of the many stereotypical notions that pairing neuro-typical and neuro-diverse students together may have a negative impact on the educational abilities and responsibilities of students without disabilities eventually leading to their downfall. However, this is far from the truth, because both the students learn from each other and through shared experiences which are required for any student's work readiness skills.

Conclusion

Overall, incorporating the buddy system for children with specific learning disabilities can create a supportive learning environment that addresses their individual needs while promoting social integration, academic growth, and emotional well-being.

The buddy system is an effective strategy for creating an inclusive classroom environment where all students feel valued, supported, and included. By fostering collaboration, peer support, and social integration, the buddy system enhances learning opportunities and promotes positive outcomes for students of all abilities.

References

Busch IM, Moretti F, Purgato M, Barbui C, Wu AW, Rimondini M. Psychological and Psychosomatic Symptoms of Second Victims of Adverse Events: a Systematic Review and Meta-Analysis. *J Patient Saf.* 2020;**16**(2):e61–e74. doi: 10.1097/PTS.0000000000000589. [PMC free article] [PubMed][CrossRef] [Google Scholar]

Foster, Kristi, "Using a peer buddy system to increase interaction between students with special needs and their peers" (2011). Theses and Dissertations. 257. https://rdw.rowan.edu/etd/257

Hawkins, Lynda, "EFFECTIVE INCLUSIVE STRATEGIES FOR STUDENTS WITH DISABILITIES: GUIDES FOR GENERAL EDUCATION TEACHERS" (2023). *Electronic Theses, Projects, and Dissertations*. 1611. https://scholarworks.lib.csusb.edu/etd/1611

Kanesan, abdul ghani & Alzaidiyeen, Naser & Seedee, Rattana. (2010). The Effectiveness of Buddy Support System Implementation among Science Teachers: The Case of Malaysia.Asian Social Science. 6. 10.5539/ass.v6n4p122. 10.5539/ass.v6n4p122. https://www.researchgate.net/publication/42368668_The_Effectiveness_of_Buddy_Support_System_Implementation_among_Science_Teachers_The_Case_of_Malaysia

Miller, B., Vaughn, S., & Freund, L. (2014). Learning Disabilities Research Studies: Findings from NICHD funded Projects. *Journal of research on educational effectiveness*, *7*(3), 225–231. https://doi.org/10.1080/19345747.2014.927251

Schrøder, K., Bovil, T., Jørgensen, J. S., & Abrahamsen, C. (2022). Evaluation of'the Buddy Study', a peer support program for second victims in healthcare: a survey in two Danish hospital departments. *BMC health services research*, *22*(1), 566. https://doi.org/10.1186/s12913-022-07973-9

Building Bridges to Number Fluency: Exploring Place Value Teaching Approaches in Overcoming Learning Disability Challenges

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Abstract

This paper aims to investigate various teaching strategies and approaches to *understand place value concepts among students with learning disability as place value forms the foundation of various mathematical concepts and skills. The participants in this study were four students diagnosed with Specific Learning Disability (SLD) attending a Government School of New Delhi. The students were enrolled in grades six and seven, with three girls and one boy included in the sample and all of them were clinically certified for their learning disability. The study employs sequential explanatory mixed method design in which quantitative data was used to assess different teaching approaches on numerical proficiency. Descriptive analysis of individual students is done by using mean, median, standard deviation and visualization of data with help of box plot. Later, the qualitative phase was employed, including in-depth interviews using open-ended questions with special educator, subject teachers, parents and students and subsequently thematic analysis was applied to find the emerging themes. The integration of both quantitative and qualitative findings provides a comprehensive and holistic understanding of this study. The study is constrained in making strong generalization as sample size is small and diverse needs of students with learning disability vary from one student to another.*

Keywords: sequential explanatory design, specific learning disability, place value.

Introduction

Mathematic is important for all and understanding of place value concepts at elementary mathematics is crucial, enabling students to decode multidigit numerals and

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various quantity representations (Lafay et al., 2023). The emphasis on place value is not only a foundation of subsequent skills like operations with whole and rational numbers but also a crucial predictor of overall mathematical achievement (Rojo et al., 2021). The strong correlation observed underscores the significance of place value in shaping student's mathematical proficiency and success in arithmetic, emphasizing its pivotal role in fostering a comprehensive understanding of mathematics(Sari & Olkun, 2019). The understanding of place value depends upon the main principles include understanding sets of 10, positions of digits in number, pattern in numbers and composing and decomposing numbers in flexible way (Rojo et al., 2021).However, the students with learning disability exhibit challenges to learn this concept, thus it is necessary to focus on the conceptual transparency in manipulative structures (Lafay et al., 2023; Rojo et al., 2021). They need diverse learning strategies to cater their challenges and fulfil the individual needs. The concrete-based approaches like Concrete Representational Abstract (CRA) and digital based intervention ease their challenges and enhance their understanding on mathematical skills (E. Bouck et al., 2017; Walcott & Romain, 2019; Zandonella Callegher & Altoè, 2020).

Background of the Study

The Concrete Representational Abstract (CRA) approach, implemented in a three-stage learning process, systematically takes students from hands on manipulation of concrete objects to pictorial representation and ultimately abstract solving in mathematics. This evidence-based practice is impactful for students with learning disabilities, addressing difficulties in computational problems especially those involving regrouping that ensures comprehensive understanding and mastery of mathematical concepts (E. Bouck et al., 2017; Nugroho & Jailani, 2019). Several studies and meta-analysis have been conducted, signifying the importance of digital based intervention that encompasses student's understanding as well. The use of digital games and their application in the intervention program of the students with learning disabilities enable to cater their challenges and enhance mathematical skills (Özkaya et al., 2024; Walcott & Romain, 2019; Zandonella Callegher & Altoè, 2020). Hence, the CRA and digital games effectively play significant role in the learning process of students with learning disabilities.

Rationale of the Study

Learning is a fundamental right of every child, regardless of their background. It is the responsibilities of both parents and institutions to ensure the provision of necessary resources, enabling students to excel in their respective fields (NEP 2020 & Government of India, 2020; RPwD Act 2016 et al., 2016). Moreover, the NCF 2023 is anticipated an inclusive education system, prioritizing discrimination free school environment and also underscore the significance of technology integration in teaching learning process (NCERT & National Curriculum Framework for School Education2023, 2023).Thus, it is imperative to focus on every group of students, including students with learning disabilities and provide maximum assistance to overcome from their academic issues and challenges.

Research Objective

- The main aim of this research study is to investigate various teaching approaches to understand place value concepts among students with learning disability.

Research Methodology

Data Collection

The participants in this study were four students diagnosed with Specific Learning Disability attending a Government School of New Delhi. The students were enrolled in grades six and seven, with three girls and one boy included in the sample. All participants were clinically certified for their learning disability.

Research Design

The study employs sequential explanatory mixed method design. The initial phase involved collection and analysis of quantitative data to assess different teaching approaches on numerical proficiency of each student. Descriptive analysis was done on each case with the help of mean, median, standard deviation and visualize these data with the help of graph. Subsequently the study transition to qualitative phase, employing in-depth interviews using open-ended questions with special educator, subject teachers, parents and students. Thematic analysis was applied to identify and analyze the emerging themes. The integration of both quantitative and qualitative findings was done where qualitative findings help to interpret quantitative results, providing a comprehensive and holistic understanding of this study. The detailed framework of the study is shown in figure 1.

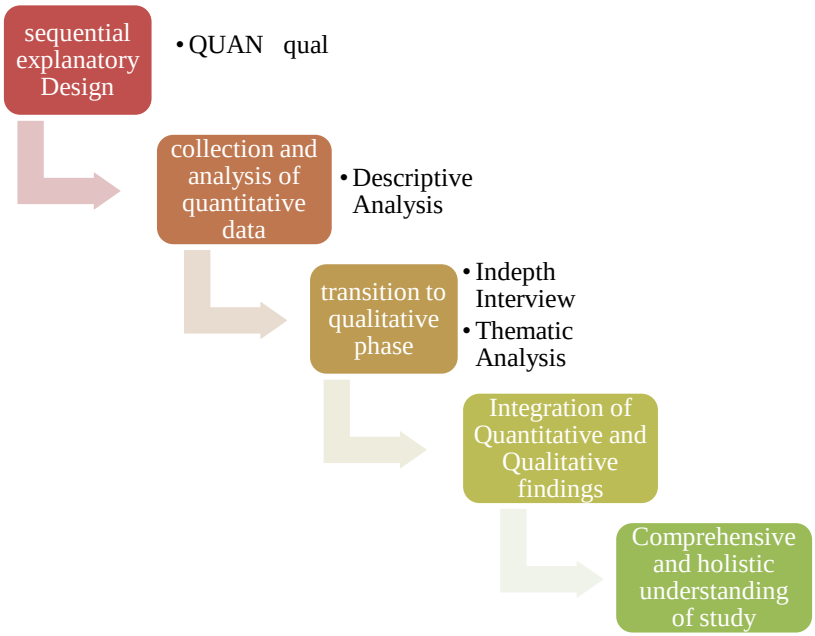


Fig.1: Framework of the Study

Demographic Details of Students

The demographics of all the four students are shown in table 1.

Table 1: Demographic Details of the Students

Participants	Age	Gender	Grade	School
P1	11	Girl	6th	Govt. Girls School
P2	12	Girl	7th	Govt. Girls School
P3	12	Girl	7th	Govt.Co-ed School
P4	11	Boy	6th	Govt. Co-ed School

Methods of Teaching

The students under consideration lack knowledge of place value although they are familiar with the number up to 100. Some struggle with number transcoding and a girl participant experiences challenges with number recognition, unable to write them when prompted verbally. To address their issues, didactic strategies coupled with teaching aids have been applied to facilitate a comprehensive understanding of place value.

- **Concrete Representational Abstract Approach:** The concrete representational abstract (CRA) approach is three stage structured learning process that guides students from hand on experiences to abstract problem solving (Bouck et al., 2018; Nugroho & Jailani, 2019). It begins with concrete manipulatives, followed by the representational stage using visual representations and finally emphasizes on mastery abstract problem solving independently. This progressive method ensures thorough understanding of mathematical concepts, fostering a seamless transition from concrete interactions to advanced cognitive skills (E. C. Bouck et al., 2018; Zulfakri et al., 2019). In teaching place value all the four students are initially taught the concept by using concrete manipulatives, then they visually represented the concept on the paper by using dots and transformed this concept into abstract form that enable them to understand the concept of place value thoroughly. These are given below in the pictures, figure 2 where students started with bundling and unbundling the materials (toothpick), then represented on the paper with dots and finally ends with numerical value.

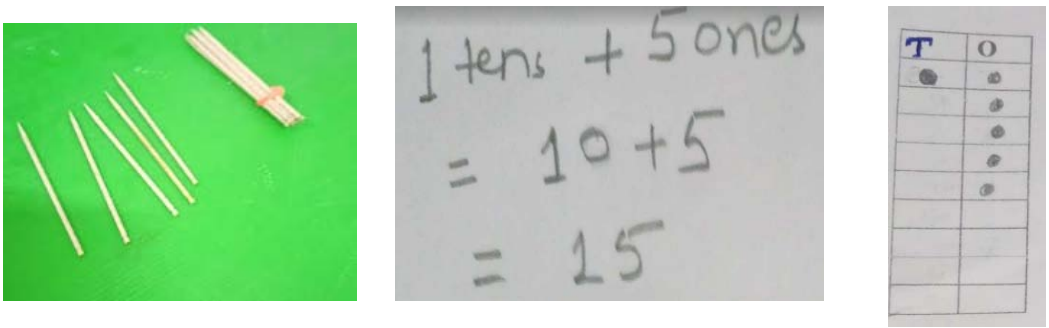
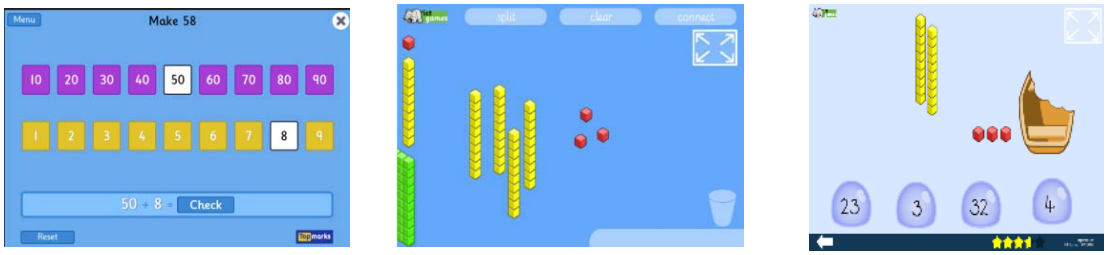


Figure 2: Representation of CRA Approach

- **Technology Based Games**: The digital landscape has shaped today's students into tech savvy learners and educators need to adapt the technologies in their classroom to accommodate individual learning preferences (Kiryakova et al., 2014). The recent advancement in ICT makes the education more flexible and personalized as well as enables to enhance the arithmetic skills and numerical processing of students with learning disability (Özkaya et al., 2024; Walcott & Romain, 2019). Moreover, the teachers strategically choose digital games that align with teaching objectives and learning trajectories, ensuring targeted support for each child's mathematical abilities (CAN, 2020). In this study the researcher incorporated some effective digital games or tools to enhance dyscalculic student's understanding of place value at the concrete level. The first ICT Games's Place Value Pieces (accessible at ICT Games- Place Value Pieces) featuring Deinnes blocks (present in left side) allow students to construct two digits or three digits number. The split and connect buttons facilitated the learning experiences. Building on this foundation , a second engaging resource was introduced: a mobile friendly shark game (accessible at ICT Games- Shark Numbers). This interactive game not only reinforced the concept of place value (i.e. each digit in 2- or 3-digit number represents) but also motivated them by star-based progress system and successful completion of challenges contributed to engaging learning environment. To further solidify their understanding, students were guided to explore Topmarks, named Place Value Charts (Topmarks- Place Value Charts) that help to understand how numbers are made and how each number depends upon on its position or place. The two versatile modes : practice and teaching presenting numbers in digits or words. The adaptability of games allows students to learn at their own pace while educators can utilize it to create interactive and effective classroom experiences.



Place Value Pieces Shark Numbers Place Value Chart

Figure 3: Representation of Digital Tools

By integrating CRA and digital games, the researcher provided a comprehensive and interactive approach to teaching place value, catering to diverse learning styles and fostering a motivating learning environment for the students with dyscalculia.

Quantitative Analysis and Interpretation

The didactic strategies i.e. CRA and technology-based approaches were applied to all four students over a period of two weeks. Initially they were taught CRA strategies for the first five days, followed by the introduction of digital tools to enhance their in-depth understanding. The tools were provided for further next one weeks , five days a week for 30 minutes each session, aimed to solidify their concepts. Before giving the intervention, pretest was conducted among the participants to know the learning gap of place value. After knowing their understanding of place value, the students were subjected to the CRP approach and subsequently feedback was taken in the form of test to know the understanding of the concepts. To make their understanding clearer and depth, digital games were introduced named place value pieces, shark numbers and place value chart. Given sufficient times to mastery over the concepts and later simple test was taken which consist of simple questions related to place values. The individual analysis of each student was conducted w.r.t both learning strategies and their perspective on each learning strategy are represented in the below table 2.

Table 1: Individual Analysis of Participants based on Learning Method

Participants	CRP	Place Value Pieces	Shark Numbers	Place Value Chart
P1	Actively participated	Neither Enjoying Nor showing interest	Losing then Progressing	Visually Proficient, orally challenged.
P2	Actively participated	Enjoying and showing interest	Progressing	Visually and Verbally Proficient
P3	Actively participated	Enjoying and showing interest	Progressing	Visually and Verbally Proficient
P4	Actively participated	Enjoying but shows less interest	Progressing	Visually and Verbally Proficient

The different learning approaches and the level of engagement of each participant are well depreciated based on highly engaged, engaged, and less engaged in the form of graph in figure 4.

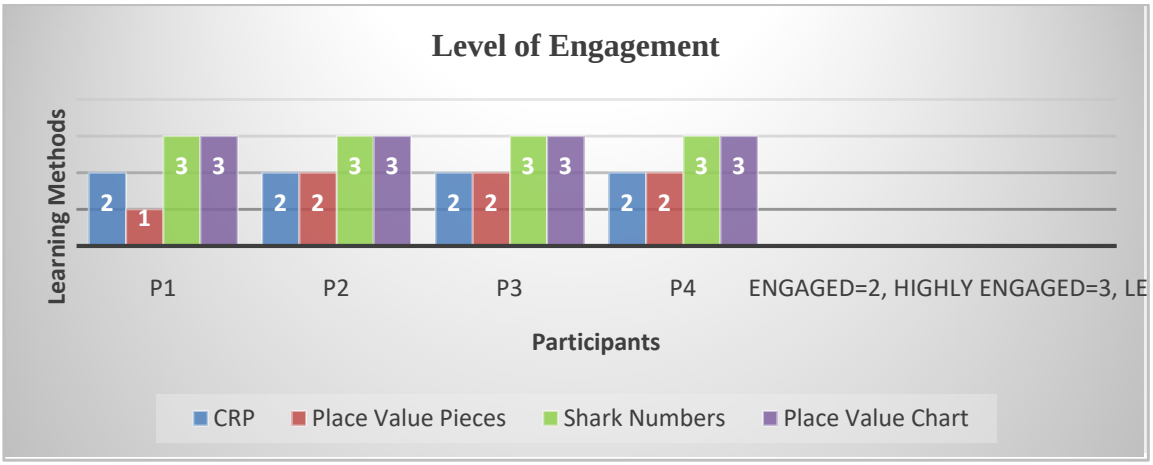


Figure 4: Graphical Representation of Level of Engagement of Individual Participant w.r.t Different Approaches

Analysis of Tests

The pretest was conducted initially to know the learning gap of place value, then first test was conducted after given intervention based on CRA approach, later final feedback was taken after subjected them with digital games in the form a test to know the effectiveness of the learning methods. The descriptive analysis of the all the tests is given in table 3. The mean, standard deviation, skewness and kurtosis were depicted in table 3.

Table 3: Descriptive Analysis of the Tests

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Prestest	4	.00	1.00	**.2500**	**.50000**	2.000	1.014	4.000	2.619
Firsttest	4	3	5	**4.25**	**.957**	-.855	1.014	-1.289	2.619
Finaltest	4	5	8	**6.75**	**1.258**	-1.129	1.014	2.227	2.619
Valid N (listwise)	4								

The means of pretest 0.25, first test is 4.25 and final test is 6.75 are given in both tables 3 and 4. The steady increase from the pretest to final test indicates a consistent upward trend in overall performance. The positive progression suggests that on average student's understanding and application of place value improved as they progressed through the s instructional methods. Similarly, the progression of median scores indicates the same. However, the increase in standard deviations suggests widening dispersion of scores, signifying greater variability in student's performance. But it does not signify that the learning strategies are ineffective as scores of means and medians are clearly indicating the progressive development in the students.

Table 4: Comparison Between the Tests

	Pretest	First test	Final test
N	4	4	4
Mean	.2500	4.25	6.75
Std. Deviation	.50000	.957	1.258
Median	.0000	4.50	7.00

The graphical representation of the results in the form of histogram are well represented for better understanding in figure 5.

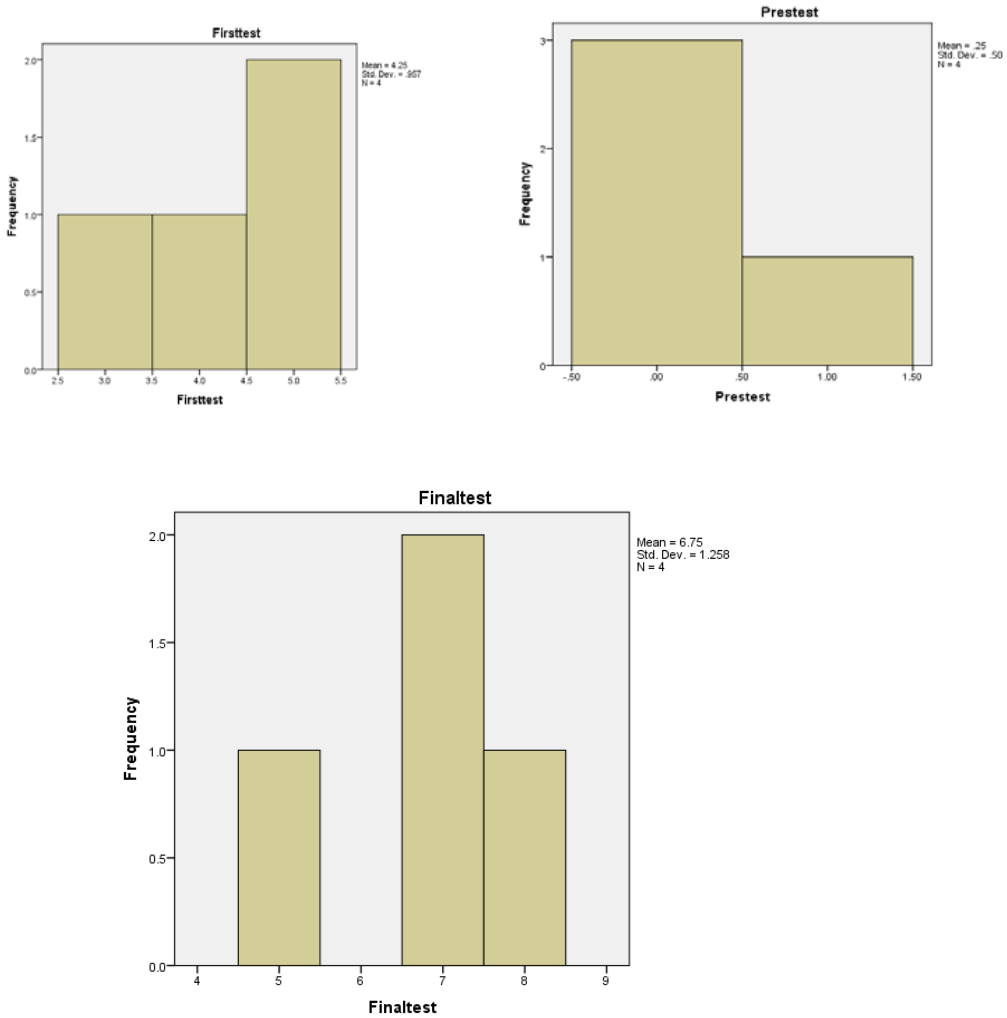


Figure 5: Graphical Representations of Pretest, First test and Final Test

To overcome the results of the standard deviations, a qualitative approach is followed which clarifies the result and makes the study more comprehensive.

Qualitative Method, Analysis, and Interpretation

After quantitative phase, the study is followed to the qualitative phase. The unstructured interview was conducted among subject teachers, special educators, parents, and students to know the impact of the different teaching and learning strategies. The subject teachers are assigned as M1,M2 and M3 as M2 is a teacher of both participants P1 and P3. While special educators as S1 and S2, similarly parents as A1,A2,A3 and A4. The responses are analyzed and systematically categorized into themes based on the frequency of specific ideas and content that are described below:

Table 5: Perspective of Subject Teachers

	Observation & Performance	Assessment of Understanding	Participation & Engagement
M1	She actively involves in place value, employing concrete methods to solve questions.	She demonstrates an improved understanding of place value compared to before	She actively participates in class activities and utilizes manipulatives.
M2	Both P1 and P3, participate in class discussion and emphasize on the importance of place value.	They are able to place the numbers in the right position.	They ask questions related to place value.
M3	In arithmetic related questions like addition or subtraction, he puts H,T,O (Hundred, Tens, Ones) to represent values	He tries to relate to other topics.	He is gradually improving and showing interest in digital games.

Table 6: Perspective Special Educators

	Differentiated Instructions	Individual Progress
S1	these learning strategies fulfil the diverse needs of the students.	Each student can learn at their own pace.
S2	Both approaches CRA and digital tools enable personalized learning	these approaches make them more engaged and motivated.

Table 6: Perspectives of Parents

	Observation at Home	Support at Home
A1	She likes to work on place value-based questions and using different manipulatives	We support her to provide the materials whatever she asked for.
A2	She plays games that is shared on my mobile	We give permission to practice her work on mobile with limited time.
A3	She teaches her sibling about the position of numbers.	We appreciate her actions and motivate her to continue.
A4	He enjoys doing homework.	We try to address his queries.

Table 7: Perspectives of Students

	Engagement & Enjoyment	Understanding & Confidence
P1	I enjoy solving questions using manipulatives.	Now, I can try to understand the concept and try to solve questions in more correct manner.
P2	I am doing this type of questions on tablet.	I can now solve level 1 based questions and feel very confident.
P3	I can expand the numbers now.	I feel very confident when my responses are correct.
P4	I enjoy doing questions on tablet.	I want to move to a higher level and try to grasp more stars.

The overall themes are made reflect on their shared experiences and perspectives across subject teachers, special educators, parents and students, providing a comprehensive view of the outcome associated with the implemented learning strategies and the respective concept. Thus, the main outcome of the study by applying didactic strategies are shown in below table 8:

Table 8: Major Outcomes of the Study

Enhanced Engagement and Motivation: Implementation of diverse strategies, effectively engage students, fostering a more interactive and dynamic learning environment.

Improved Understanding and Confidence: The learning approaches contribute to noticeable increase in their confidence level with the continuously improvement in the understanding of the place value concept.
Individualized and Personalized Learning: These strategies cater individual needs, enhance sense of personalized and individualized learning.
Supportive Ecosystem and Collaboration: Collaboration among subject teachers, special educators, parents and technology creates a supportive ecosystem, show positive impact on overall learning experiences of the students.
Academic Enjoyment: Students exhibit a positive outlook on academic challenges, expressing aspiration to progress to higher levels and finding finishing enjoyment in completing academic tasks. Thus, this process helps to enhance academic buoyancy and overall academic resilience among students.

Discussion and Results

The study comprising both quantitative and qualitative phases, illuminates the progressive development of the student's understanding of the place value concepts. The observed differences in means among pretest, first test and final test indicate the effectiveness of the learning methods. The initial ambiguity in standard deviations has been clarified by the qualitative analysis, providing a comprehensive result. The integration of both the results of quantitative and qualitative gives better understanding of the study. Moreover, it signifies that both learning approaches CRA and digital games cater to the challenges of the students and contribute significantly to solidifying the concept of place value.

Conclusion

The study has shown valuable insights into the effectiveness of implemented learning strategies on students with learning disabilities. The subject teachers, special educators and parents have created a supportive ecosystem that fosters engagement, personalized learning and technological integrations. The amalgamation of both quantitative and qualitative analysis gives holistic results of the study. While the study cannot be generalized due to the small sample size, it suggests that combination of diverse learning strategies coupled with supportive network can significantly contribute to academic growth of students with learning disability and promote resilient academic journey.

References

Bouck, E. C., Satsangi, R., & Park, J. (2018). The Concrete–Representational–Abstract Approach for Students With Learning Disabilities: An Evidence-Based Practice Synthesis. *Remedial and Special Education*, *39*(4). https://doi.org/10.1177/0741932517721712

Bouck, E., Park, J., & Nickell, B. (2017). Using the concrete-representational-abstract approach to support students with intellectual disability to solve change-making problems. *Research in Developmental Disabilities*, *60*, 24–36. https://doi.org/10.1016/J.RIDD.2016.11.006

CAN, D. (2020). Supporting Learning Trajectories for the Development of Number Concept: Digital Games. *Kuramsal Eğitimbilim*, *13*(4). https://doi.org/10.30831/akukeg.692165

Kiryakova, G., Angelova, N., & Yordanova, L. (2014). *GAMIFICATION IN EDUCATION*. https://www.researchgate.net/publication/320234774_GAMIFICATION_IN_EDUCATION

Lafay, A., Osana, H. P., & Levin, J. R. (2023). Does Conceptual Transparency in Manipulatives Afford Place-Value Understanding in Children at Risk for Mathematics Learning Disabilities? *Learning Disability Quarterly*, *46*(2). https://doi.org/10.1177/07319487221124088

NCERT, & National Curriculum Framework for School Education2023. (2023). *National Curriculum Framework for School Education National Curriculum Framework for School Education 2023*.

NEP 2020, & Government of India. (2020). *National Education Policy 2020 Ministry of Human Resource Development Government of India*.

Nugroho, S. A., & Jailani, J. (2019). The Effectiveness of Concrete Representational Abstract Approach (CRA) Approach and Problem Solving Approach on Mathematical Representation Ability at Elementary School. *KnE Social Sciences*. https://doi.org/10.18502/kss.v3i17.4620

Özkaya, A., Sardohan Yıldırım, A. E., Altındağ Kumaş, Ö., Oral, H., & Can, E. (2024). Digital Game Applications on Mathematics Achievement of Students at Risk of Mathematics Learning Difficulty. *Yaşadıkça Eğitim*, *38*(1), 54–69. https://doi.org/10.33308/26674874.2024381582

Rojo, M. M., Knight, B., & Bryant, D. P. (2021). Teaching Place Value to Students With Learning Disabilities in Mathematics. *Intervention in School and Clinic*, *57*(1). https://doi.org/10.1177/1053451221994827

RPwD Act 2016, India Code, & Digital Repository of Laws- A System of Laws of Communication. (2016). *THE RIGHTS OF PERSONS WITH DISABILITIES ACT, 2016*. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.indiacode.nic.in/bitstream/123456789/15939/1/the_rights_of_persons_with_disabilities_act%2C_2016.pdf

Sari, M. H., & Olkun, S. (2019). The relationship between place value understanding, arithmetic performance and mathematics achievement in general. *Elementary Education Online*, *18*(2). https://doi.org/10.17051/ilkonline.2019.562086

Walcott, P., & Romain, N. (2019). Using Digital Games to Enhance the Mathematical Skills of Children with Dyscalculia. *Journal of Education and Development in the Caribbean*, *18*(2). https://doi.org/10.46425/j418025822

Zandonella Callegher, C., & Altoè, G. (2020). Data and supplemental material of the paper "Effectiveness of digital-based interventions for children with mathematical learning difficulties: A meta-analysis." *Data in Brief*, *31*. https://doi.org/10.1016/j.dib.2020.105976

Zulfakri, Z., Ikhsan, M., & Yusrizal, Y. (2019). Improving the Ability of Representation and Problem Solving Through Concrete Representational Abstract (CRA) Approach in Mathematical Learning. *International Journal for Educational and Vocational Studies*, *1*(3). https://doi.org/10.29103/ijevs.v1i3.1585

Study of Mathematical Interest among Elementary Students with Dyscalculia

Shallu Rani[1]

Abstract

Mathematical interest as a predictor for mathematics achievement of students learning and getting involved in mathematical activities in their leisure time. Mathematical interest generates curiosity and creativity among students and motivates them students to solve mathematical problems to discover methods and apply their theoretical knowledge to practical solutions in life. Students with dyscalculia disorder mainly face basic problems while solving mathematical activities. The present objective of this study was to understand the importance of mathematical interest among elementary school students with dyscalculia. The researcher used the cluster sampling technique and a representative sample of this study was 37 elementary school students with dyscalculia, at the government school of Patiala. Formal and informal, both types of methods were used by the researcher for the identification of elementary school students with dyscalculia and also used mathematical interest inventory (Dubey,1993) tool in this study. The finding of the study revealed that there is no significant gender in mathematical interest among students with dyscalculia.

Keywords: Mathematical Interest, Elementary School Students, Dyscalculia

Introduction

"Education means the bringing out of the ideas of universal validity which are latent in the mind of every man". - Socrates.

The main focus of education in the twenty-first century is to develop highly proficient mathematicians who will help prepare for the future needs of the individual. Kothari (1966) highlights in their report that eighth-grade students can successfully solve mathematical problems on average, 24.31 out of 67 questions/problems based on the fundamental arithmetic of the fifth, sixth, and seventh grades of the students. NEP (2020) mainly defined the basic learning requirements of the child which include basic mathematical, reading, and writing skills, and also emphasized ensuring that age of nine, the child can learn basic master Foundational Literacy and Numeracy (FLN) skills. The NIPUN campaign is chiefly focused on creating an educational learning environment for

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the students to attain comprehensive FLN skills by 2026–2027. which include necessary learning outcomes for basic language and literacy knowledge of the students such as verbal language development, linguistics, deciphering, vocabulary/phrases, reading and writing comprehension skills, etc. Mathematical concepts are mainly interconnected and organized hierarchically way which plays a significant role in identifying those students who face problems during the learning mathematical activity. Learning mathematics has various benefits, including the formation of good work habits, the ability to perform work habits, the capacity to work independently, and the acquisition of problem-solving skills, or enhance the understanding of another subject.

Mathematics is a mental exercise that strengthens the mind which includes self-control, self-analysis or identification of what is known and what needs to be solved, determining a solution approach, as well as interpretation of the outcomes. According to educational stakeholders, learning mathematics promotes mainly creativity, reasoning, simplicity, validity, absolute certainty, and verification of results, as well as mental and intellectual development. Mathematics is the gateway to all other sciences. Students' mathematics achievement not only refers to obtaining excellent marks but also refers to including specific development of one's mathematical aptitude and abilities. While there had been some prior knowledge that children could be especially delayed in mathematics, the idea of developmental dyscalculia seems to have originated in the 1960s-1970s. Developmental dyscalculia is an auxiliary difficulty with the numerical abilities of the child that comes from a genetic or innate problem with the areas of the brain dysfunction that directly link to the anatomical and physiological basis of mathematical ability (Kosc, 1974). Dyscalculia is also called visual deficiency. Learning Disability Association of America (LDAA), 2001–2002 highlights the specific issues of understanding and arranging numbers in learning or trouble in counting, writing, telling time, etc. Dyscalculia students mainly face difficulty in learning or comprehending arithmetic/mathematical activities such as difficulty in understanding numbers, calculating, learning how to manipulate numbers, and learning mathematical logical facts (Bhargava and Bhardwaj 2014).

Mathematical interest is a motivating factor that influences students' participation in math-related activities that are also related to learning in other subjects. The term "mathematical interest" signifies a student's preference to learn mathematical equations, mathematical content, or mathematical subject matter. It also describes how much students enjoy solving mathematical problems and engaging themselves in mathematical activities in their free time. Those students who play a significant interest in mathematical activity are more likely to be curious and creative, to solve mathematical problems using the discovery method, and to apply their theoretical knowledge to real-world problems. Mathematical interest mainly considers liking or preference to learning the mathematics content and also enjoying or participating in mathematics activities which chiefly include puzzle games, problem-solving activities, or sums indicated solving sums, more practicing mathematics activities in leisure-time by Dubey (1993).

An individual with a mathematical interest pertains to new ideas, use of creative thought processes, and recurs mathematical activity without feeling uninterested or enhances the student's performance in mathematical tasks and helps them acquire learning in mathematics, not only based as subject knowledge or getting good marks but gain the knowledge for practically apply in their daily life. (Heinze, Reiss and Augsberg, 2005). Math is extremely beneficial in many subject areas that are mainly taught to all students from pre-primary education level to higher level. Those students are not interested in mathematics, they mainly face the problem of mathematics phobia.(Ghosh and Ghose, 2013).

Modern society mainly understands the importance of learning mathematics and also highlights it is a broad social phenomenon that reflects the variety of applications and modes of expression. Mathematics is not only reflected in particular fields but it is also commonly found in elementary through higher secondary mathematic skills (reading, writing), algebra, trigonometry, solid geometry, calculus, etc.

Related Reviews

Rubinsten and Tannock (2010) concluded their study that math anxiety affects the negative performance or interest of students. The experiment method used by the researcher which twelve children with Down syndrome (dyscalculia disorder) and eleven classmates with typical development performed in mathematics. The findings of the study revealed that the mathematical problem was preceded by one of four types of priming words: positive, neutral, negative, or mathematically related. Nfon (2016) investigated a study on mathematical problems (dyscalculia) in primary school level two in computation, sequential counting, and lack of confidence doing mathematical activity. The survey research design was used, and a sample of 100 primary students was selected for the study. Results of the study showed that Sequential counting, a lack of confidence, and the computation of mathematical facts have a major impact on the mathematical achievement of primary school students.

Furthermore, some studies revealed that the beginning of math learning represents a critical developmental era for mathematical competencies, and age may be an influence, particularly in elementary school (Brankaer et al., 2014, Raddatz et al., 2017). Children with developmental disabilities had challenges with number counting-related tasks. The deficits of DD children remained consistent across grades. (Kuhn et al., 2013; Mammarella and colleagues (2021); von Wirth et al., 2021). Additionally, Decarli and colleagues (2023) conducted an experimental study on fifty-eight students with dyscalculia disorders and 42 students assigned to a control group who had good mathematical aptitude and mathematical interest. The experimental group taught in both symbolic and non-symbolic number sense as measured by easy computer exercises. Results of the study showed that fundamental numerical skills could be addressed for early identification of at-risk students as well as for intervention, and they also lend credence to the number-sense-deficit concept.

Furthermore, these studies highlight that overall negative perceptions of mathematical subjects of the students and their lack of mathematical interest impact their mathematical attitudes and overall academic performance of the schools. Additionally, it also represented the critical gap in teacher/educator awareness and training of new innovative methods of teaching-learning process that leads overall lack of mathematical interest in the students with dyscalculia order.

Significance of the Study

Mathematics is essential for students to learn for several motives which include the development of creativity, the ability to recognize the mathematical, generalize experiences in new situations, the ability to think logically, and the ability to solve problems in everyday scenarios. Mathematics useful tool for resolving issues in daily life that's the reason, mathematics is regarded as one of the most crucial important as subjects included in the curriculum for pre-primary-level to upper-secondary school education. Mathematics is a broad subject that forms the foundation of all disciplines of sciences, and the arts and is also related to many aspects of daily life activity. National Education Policy (2020) mainly emphasizes the importance of mathematical learning and also highlights the importance of new innovative techniques or methods during the teaching-learning process. Mathematics is a highly abstract subject that's the reason most of the students at the upper secondary school level of education fail in mathematics subject. Those students have a positive attitude or interest in mathematics subject; they perform well in mathematics activities.

Mathematical knowledge and application have always been fundamental to every aspect of individual life. Interest plays an essential role in motivating the students in learning. A teacher should have a favorable approach towards students with a learning disability who face the problem of learning issues, as they require more attention compared to (intelligent students) who successfully do mathematical activities. Additionally, the teachers perceive different aspects of students' difficulty in mathematical learning. so, it's the teacher's responsibility to provide need-based programs according to student ability or interest. In other words, learning mathematics is mainly related to their attitude. The researchers chiefly considered a different number of independent variables that related to mathematics through a review of the literature and also concluded that attitudes or interest toward mathematics, were the influencing factors related to mathematics performance. Hence, the researcher considered this paper a " study of mathematical interest among elementary school students with dyscalculia".

Statement of the Problem

- Study of mathematical interest among elementary students with dyscalculia

Objective of the Study

- To study the gender differences in mathematical interest among students with dyscalculia.

Hypothesis of the Study

- There will be no significant gender difference in mathematical interest among students with dyscalculia.

Research Methodology

The researcher used a descriptive survey method for this study. The cluster sampling technique was used by the researcher. The formal and informal methods used by the researcher to collect the sample from seventh-class students of the government secondary school at Patiala. The first researcher checked the last two years' performance of the students who got less than 35% marks in mathematics subject, then used teacher referral forms (self-prepared) to identify students with dyscalculia.

Process of sample collection by researcher

Table 1.1

Total students in the seventh class	153
Less than 35 % marks in mathematics	67
Teacher Referral form through identification	37

With the help of teachers' referral forms, the researcher identified 37 students (21 male and 16 female) and also used the mathematical interest inventory (Dubey,1993) tool in this study, one mark was assigned for a yes answer, and no was assigned for zero marks.

Statistical Technique Used

The researcher used mean, median, mode, skewness, kurtosis, and t-test were also employed in this study.

Analysis and Interpretation of Data

In educational research, it is the heart of research to present the data and interpretation of the data. In this study, the researcher used a mathematical interest inventory tool for data collection of those students who suffer from dyscalculia disorder.

This section is divided into two parts.

Section I

This section shows the descriptive part of the study.

Table-1.2

Sr. No.	Class Interval	Frequency (male)	Frequency (Female)
1	0-8	2	1

2	8-16	4	3
4	16-24	10	8
5	24-32	4	3
6	32-40	1	1
	Total	21	16

Table -1.3

Sr. No	Mean	Median	Mode	SD	Skewness	Kurtosis
Male	19	20	22	6.89	-0.37	0.29
Female	19.68	19.5	19.12	6.71	0.08	0.21

Figure 1.1 Frequency Polygon

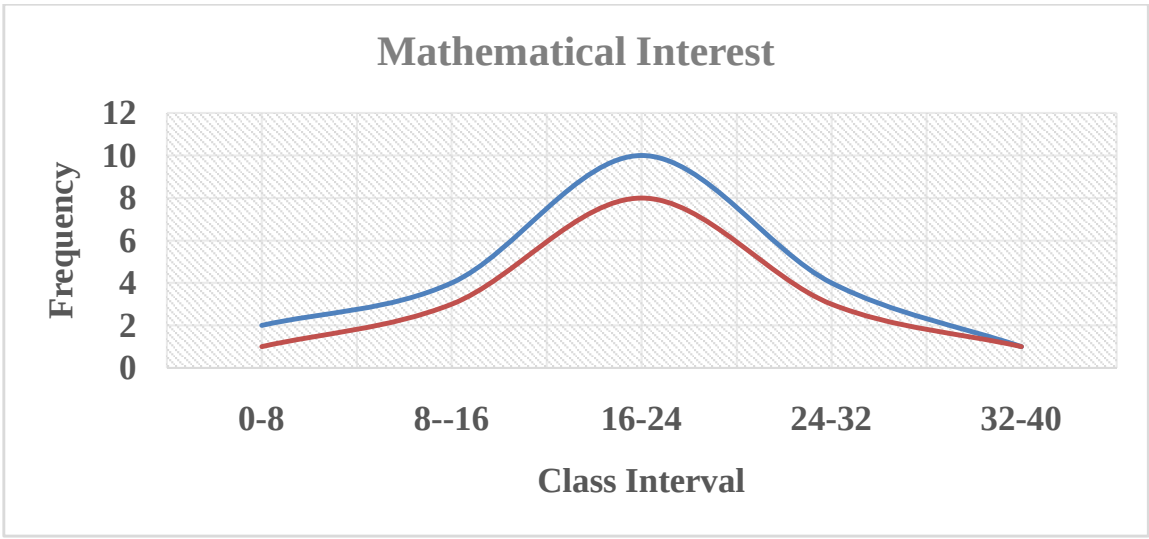


Table 1.2, 1.3, and fig. 1.1 shows the overall performance of students with dyscalculia in mathematical interest. Table 1.2 shows the mean median and mode proximate to each other. The value of Skewness of males represents negative but females show positive and the kurtosis value represents platykurtic of males and the female value highlights the leptokurtic in nature.

Section II

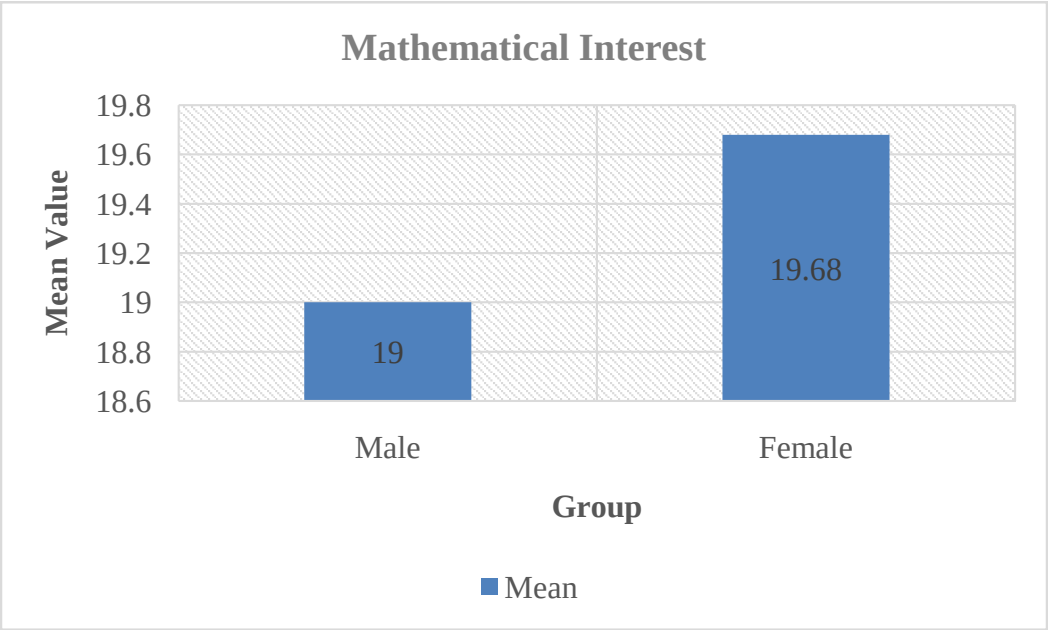
The section deals with the t-test of mathematical interest inventory test of students with dyscalculia disorder (male and female).

Table 1.4

Sr. No	Mean	SD	SE	t-test	Significant
Male	19	6.89	1.69	0.79	Non-significant
Female	19.68	6.71	1.63		

*degree of freedom 35.

Fig 1.2 (Bar Graph)



Here, we can say that the hypothesis - stating that There will be no significant gender difference in mathematical interest among students with dyscalculia, stands accepted.

Results and Discussion

The findings of the study revealed that there is no significant difference exit gender difference in mathematical interest among elementary school students with dyscalculia.

The teacher must be aware of different remedial strategies that might be very helpful for the students to prevent developing dyscalculia as well as also help them to compensate and work concomitantly with the strength at the task level as well as with the deficits in the daily life activity. Many students with learning problems in mathematics subject that enter upper grades without the knowledge of basic mathematical skills of the learner so it is the responsibility of the teachers to use the remedial program at the primary and elementary levels that will be very helpful in reducing the learning problems in math mathematics subject by the learner. Teachers should mainly focus on improving the mathematical skills of the students and help reduce anxiety, arouse interest, bridge the gender gap or provide equal opportunities to the students during mathematical activity, and emphasize the importance of achievement in mathematics and the mathematical sciences at school so

that students more practice or participate in learning number concepts, and join mathematical games that will enhance their problem-solving skills of the students.

Conclusion

The results of the study also presented the need for a focused intervention program, or efficient teaching techniques that play a significant role in improving the teaching of mathematics for students who are having trouble with the mathematical subject. The study reveals insightful information that could be used to improve decisions regarding educational policies and build a more welcoming or friendly learning environment for all types of students.

Delimitation of the Study

This study delimits only elementary seventh-class school students with dyscalculia.

References

Bhargava, R., & Bhardwaj, R. L. (2014). *Learning disability battery.* Agra: National Psychological Association.

Brankaer C, Ghesquière P, De Smedt B (2014) Children's Mapping between Non-Symbolic and Symbolic Numerical Magnitudes and Its Association with Timed and Untimed Tests of Mathematics Achievement. *PLoS ONE 9*(4), e93565. https://doi.org/10.1371/journal.pone.0093565

Decarli, G., Sella, F., Lanfranchi, S., Gerotto, G.,Gerola, S., Cossu, G., & Zorzi, M. (2023). Severe Developmental Dyscalculia Is Characterized by Core Deficits in Both Symbolic and Nonsymbolic Number Sense. *Psychological Science, 34*(1) 8–21.

Dubey, L. N. (1993). *Mathematics Interest Inventory.* Agra: Psychological Research Cell.

Ghosh, P., & Ghose, A. (2013). College students' experience with mathematics in school. *Indian Journal of Educational Research, 6,* 256-268.

Heinze, A., Reiss, K., & Augsborg, F. R. (2005). Mathematics achievement and interest in Mathematics from a differential perspective. *ZDM- Mathematics Education, 37*(3), 212-220.

Kosc, L. (1974). Developmental dyscalculia. *Journal of learning disabilities, 7*, 164- 177.

Kothari Education Commission. (1966). *Report of the Education Commission 1964- 66. Part 1*. Manager of Publications: Delhi.

Mammarella, I. C., Toffalini, E., Caviola, S., Colling, L., and Szűcs, D. (2021). No evidence for a core deficit in developmental dyscalculia or mathematical learning disabilities. *Journal of Child Psychology. Psychiatry 62,* 704–714. doi: 10.1111/2Fjcpp.13397

National Education Policy. (2020). New Delhi: Ministry of Human Resource Development, Government of India.

Nfon, N. F. (2016). A survey of the mathematical problems (dyscalculia) confronting primary school pupils in Buea municipality in the southwest region of Cameroon. *International Journal of Education and Research, 4*(4), 437-450.

Raddatz, J., Kuhn, J.-T., Holling, H., Moll, K., and Dobel, C. (2017). Comorbidity of arithmetic and Reading disorder: basic number processing and calculation in children with learning Impairments. J. *Learn. Disabled. 50,* 298–308. doi: 10.1177/0022219415620899

Rubinsten, O., & Tannock, R. (2010). Mathematics anxiety in children with developmental dyscalculia. *Behav Brain Function, 6,* 46. https://doi.org/10.1186/1744-9081-6-46.

Von Wirth, E., Kujath, K., Ostrowski, L., Settegast, E., Rosarius, S., Döpfner, M., Schwenk, C., & Kuhn, J. T. (2021). The co-occurrence of attention-deficit/hyperactivity disorder and mathematical difficulties: an investigation of the role of basic numerical skills. *Res. Dev. Disabil. 112,* 103881. doi: 10.1016/j.ridd.2021.103881

Zorzi, M. (2023). Severe Developmental Dyscalculia Is Characterized by Core Deficits in Both Symbolic and Nonsymbolic Number Sense. *Psychological Science, 34*(1) 8–21.

Website visited

- https://nipunbharat.education.gov.in/
- https://ldaamerica.org/

Progress towards Inclusive Education: A Review of Policies and Challenges in Indian Schools

Mona Sedwal[1]

Abstract

The inclusive education is an overarching umbrella covering the children from the special needs to the marginalised groups in the current context. However, predominant commonalities persist, illustrating that often the lives of people with disabilities in India are predominantly characterised by poverty and marginalisation from mainstream social processes. This paper based on the secondary data sources analyses the multifaceted domain of disability in Indian context. Initial section focuses on unravelling the intricate tapestry of educational status among children with disabilities. Following discussion policy perspectives on disability tracing the trajectory of policy trends over time within the school system. It also sheds light on role of the institutions in implementing the policies. A few national and international best practices are documented to draw insights from diverse contexts. The critical role played by teachers and parents as key stakeholders are highlighted as enablers for creating inclusive environment. The final section attempts to propose on future perspectives outlining the envisioned steps for progress and inclusivity. The comprehensive analysis focuses on holistic understanding on issues and challenges related to children with disability and the role of National Education Policy 2020.

Keywords: Marginalization, Inclusive Education, NEP 2020, Indian Schools.

In India three fourths of the children with special needs (*Divyang*) out of the 78.64 lakh, aged five and above, are not enrolled in any educational institution It is further reported that 12 percent dropped out while 27 percent never experienced formal education. Beyond these statistics, the intersection of structural factors like caste, gender, religion, and poverty shapes diverse individual experiences (UNESCO,2019). This highlights the urgency for inclusive education due to the intersection of structural factors like caste, gender, religion, and poverty which shapes diverse individual experiences. However,

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overarching commonalities persist, illustrating that the lives of people with disabilities in India are predominantly characterised by poverty and marginalisation from mainstream social processes. This underscores the imperative need for progress towards a more inclusive educational landscape.

This paper based on the secondary data sources analyses the multifaceted domain of disability in Indian context. Initial section focuses on unravelling the intricate tapestry of educational status among children with disabilities. Following discussion policy perspectives on disability tracing the trajectory of policy trends over time within the school system. It also sheds light on role of the institutions in implementing the policies. A few national and international best practices are documented to draw insights from diverse contexts. The critical role played by teachers and parents as key stakeholders are highlighted as enablers for creating inclusive environment. The final section attempts to propose on future perspectives outlining the envisioned steps for progress and inclusivity. The comprehensive analysis focuses on holistic understanding on issues and challenges related to children with disability and the role of National Education Policy 2020.

Examining perceptions of disability, encompassing both mental and physical aspects, reveals an evolving terminology that significantly impacts education. Within the realm of educational philosophy, Howard Gardner's theory of multiple intelligences provides insight into why certain skills are favored over others, particularly emphasizing linguistic and logical thinking. Consequently, children less adept in these intelligences often face the "at risk" label, leading to referrals for special education services. The fundamental distinction between the medical model and the social model in understanding Special Educational Needs (SEN) carries profound implications for educational practices and societal inclusivity. (Hassanein)

The assimilation approach, aligned with the medical model, essentially advocates for the segregation of children with learning difficulties. This perspective categorizes these children based on their challenges and prescribes specialized educational interventions to rectify perceived deficits. The underlying assumption is that altering the child, through tailored treatments and pedagogical programs, is necessary for them to assimilate into the mainstream educational system. This approach operates on the premise that children must conform to the established norms of learning. (Hausstätter, 2004)

On the other hand, the social model, which forms the basis of inclusive education, challenges the notion that difficulties are inherently within the child. Instead, it asserts that disabilities are socially constructed, with society creating barriers that lead to exclusion and marginalization. In this perspective, special education is seen as reinforcing social inequalities by perpetuating a system that expects individuals to fit a predetermined model. The essence of the social model lies in prescribing change at a systemic level. Rather than focusing on altering individual students, the emphasis is on rethinking and transforming the entire school's teaching and learning environment. The goal is to create an educational setting that authentically embraces diversity,

accommodating the unique needs of every child. This paradigm shift aims to break down barriers, fostering an inclusive ethos that recognizes and values the contributions of every student, irrespective of their learning differences. In embracing the social model, education becomes a tool for societal change, challenging norms and promoting a more equitable and inclusive future. (Ainscow, 1999)

Sarkar, T (2020) in her study highlights that, In India, inclusive education faces challenges, particularly for children with disabilities. Progress beyond primary school is limited for them, with only 9% completing secondary education. A significant portion, 45%, of disabled individuals are illiterate, and only 62.9% of those aged 3 to 35 have attended regular schools. Disparities exist among disability categories and genders; children with autism, cerebral palsy, and girls with disabilities face lower enrollment rates. Disability often hinders access to pre-school and primary education, and less than 40% of schools have ramps, with only 17% having accessible toilets. Despite the National Education Policies focus on technology, only 59% of schools have access to electricity nationwide.

Uditsky (1993) defined inclusion as "a set of principles which ensures that the child with a disability is viewed as a valued and needed member of the community in every respect". Similarly, Farrell (2004) defined inclusion as "the extent to which a school or community welcomes pupils as full members of the group and values them for the contribution they make. This implies that for inclusion to be seen to be "effective" all pupils must actively belong to, be welcomed by and participate in a mainstream school and community - that is they should be fully included"

The discourse surrounding disability encompasses various lexicons, from diagnostic language used by professionals to general terms in public policy and the media, as well as the diverse descriptions employed by individuals and social identity groups. In schools, discussions about language often revolve around finding inclusive and respectful descriptors for children, ranging from diagnostic terms like "student with a learning disability" to broader phrases like "child with special needs." However, certain terms, even if diagnostically accurate, are considered outdated and offensive, such as "retarded," while others are rejected for being euphemistic or patronizing, like "special needs," "physically challenged," or "differently abled." (Shapiro, A & Baglieri, S)

Understanding the perspectives of individuals with disabilities on language choices offers insight into the complexity of this matter. Cultural discomfort with disability language is rooted in the historical context of the medical model, where disability was viewed negatively. Shifting from perceiving disability as something wrong with bodies to something about bodies represents a struggle reflected in our language choices and changes. (Ware, 2001)

The awkwardness surrounding discussions about disability and the fear of causing offence stem from a cultural aversion to disability. People hesitate to talk openly about disability, either ignoring or using euphemisms to soften conversations about perceived taboo or shameful topics. The cultural journey toward abandoning legacy disability

labels and stigma emphasises the need for language practices that authentically capture individual and collective disabled identities, fostering new ways of communication about disability.

A persistent challenge lies in the scarcity of data although the National Achievement Survey (NAS) collects disability data, it fails to include this information in State Report Cards. Compounding the issue is the flawed identification process, often resulting in the under-reporting of disabilities. Teachers, in particular, grapple with the substantial challenge of accurately identifying children with disabilities. It is noteworthy that the National Education Policy (NEP) 2020 addresses learning disabilities in the context of teacher training for identification but overlooks other cognitive disabilities outlined in the Rights of Persons with Disabilities Act (RPWD), such as intellectual disabilities and autism.

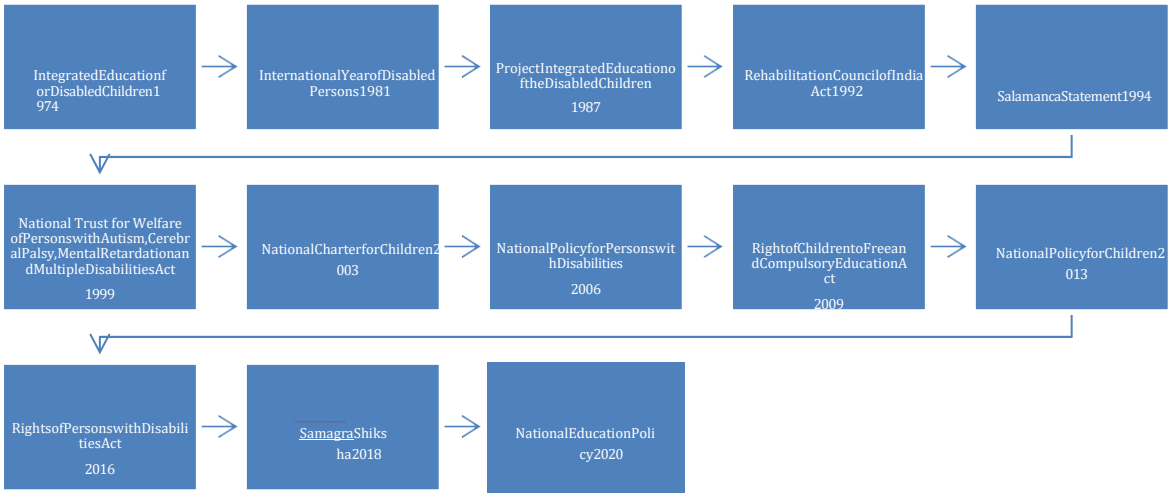
Trajectory of Policy Trends on Disability in Indian Schools

The evolution of social models of disability in the Indian education system signifies a shift from merely addressing how to remediate disabilities to examining how the school environment either facilitates or hinders interactions among children with diverse bodies, minds, and emotions. The Disability Rights Movement played a crucial role by advocating for equal access and opportunities for children with disabilities, particularly emphasising the importance of inclusion within educational settings.

Practitioners in disability studies emphasize that exclusively concentrating on diagnosing and remediating impairments restricts the educational experience for children with disabilities. Instead, by framing disability within its social dimensions, the focus shifts to restructuring schools and curricula to promote access, learning, and meaningful participation for students with disabilities alongside their peers. This approach fosters a more inclusive and equitable educational environment that goes beyond remediation, emphasizing the importance of reshaping educational practices to support the diverse needs of all students.

Over the years, the government has initiated several programs and schemes to fulfil its commitment to the education of children with disabilities. One of the earliest endeavours in this direction was the launch of the Project Integrated Education of the Disabled Children (PIED) in 1987, a collaborative effort with UNICEF. Implemented initially in 10 blocks across 10 States and Union Territories, PIED laid the foundation for subsequent initiatives.

Figure 1: Acts, Policies and Programmes for Inclusion



Building upon the insights gained from PIED, the Integrated Education for Disabled Children (IEDC) scheme, inaugurated in 1974, underwent a significant revision in 1992. This revision involved a shift from the Ministry of Welfare to the Department of Education, facilitating increased support for children with disabilities within mainstream schools. The IEDC presently operates as an ongoing initiative, offering financial assistance for various purposes, including teacher salaries, assessment and provision of aids and appliances, specialized teacher training, elimination of architectural barriers, provision of instructional materials, community mobilization, early detection, and resource support, as outlined by the Ministry of Human Resource Development in 1992. Covering a substantial 15,000 schools, this scheme has successfully enrolled a total of 60,000 children, as reported by the Rehabilitation Council of India in 2000.

As India endorsed the Salamanca Statement (UNESCO, 1994), the 1990s witnessed a swift integration of the term 'inclusive education' into numerous official documents and reports, including those published by institutions like the NCERT, as well as media outlets. Throughout its historical evolution, both the District Primary Education Program (DPEP) and its subsequent manifestation, the *Sarva Shiksha Abhiyan* (SSA), have adopted a proactive stance by endorsing a "multi-optional delivery system" to cater to the educational needs of children with disabilities, commonly denoted as "children with special needs (CWSN)."

Under the purview of SSA, a focused approach on inclusive education has been outlined through eight priority areas of intervention. These encompass a comprehensive survey for the identification of CWSN, the assessment of their specific needs, provision of assistive devices, establishment of networks with NGOs and government schemes, ensuring barrier-free access, teacher training in Inclusive Education (IE), appointment of resource teachers, and adaptation of curricula, textbooks, and Teaching-Learning

Materials (TLM) to suit diverse learning needs. Noteworthy is the fact that while most priorities address issues of access, the last three specifically target classroom-based processes crucial for determining the overall quality of the educational experience. However, the degree of emphasis and the success of these initiatives exhibit variations, often compounded by a lack of comprehensive information for a thorough evaluation of their impact.

In 1999, a pivotal moment unfolded with the enactment of the National Trust for Welfare of Persons with Autism, Cerebral Palsy, Mental Retardation, and Multiple Disabilities Act, setting the stage for targeted support. Building upon this foundation, 2005 witnessed a transformative step forward as the education landscape embraced the National Curriculum Framework (NCF). This framework not only prioritised education but also championed the fundamental principle of respect for learners' diversity, emphasising an inclusive approach to learning. The National Trust Act (NTA) offers various schemes like DISHA (Early Intervention and School Readiness Scheme), VIKAAS (Day Care), SAMARTH (Respite Care), GHARAUNDA (Group Home for Adults), NIRAMAYA (Health Insurance Scheme), SAHYOGI (Caregiver training scheme), GYAN PRABHA (Educational support), PRERNA (Marketing Assistance), SAMBHAV (Aids and Assisted Devices), BADHTE KADAM (Awareness and Community Interaction) for PwD.

The momentum continued in 2006 with the adoption of the National Policy for Persons with Disabilities. This policy served as a comprehensive guideline, addressing various facets of education for individuals with special needs. Simultaneously, a position paper published by the National Focus Group on Education of Children with Special Needs provided valuable insights, contributing to a nuanced understanding of the challenges and opportunities in this domain.

The global commitment to disability rights gained prominence in 2008 when the country ratified the Convention on the Rights of Persons with Disabilities. This international agreement signalled a collective effort to ensure equal opportunities and participation for individuals with disabilities. The year 2009 marked a significant stride forward with the enactment of the Right of Children to Free and Compulsory Education Act. This legislative move not only underscored the importance of education but also emphasized the right of every child, including those with disabilities, to access quality education.

In 2016, a milestone was achieved with the enactment of the Rights of Persons with Disabilities Act, reinforcing the commitment to safeguarding the rights and dignity of individuals with disabilities across various sectors, including education. The transformative journey persisted in 2018 with the launch of *Samagra Shiksha*, the national flagship education program. This initiative aimed to provide a holistic and inclusive education experience, fostering an environment where diversity is celebrated, and every learner, irrespective of abilities, is given the opportunity to thrive.

Culminating this trajectory, 2020 witnessed a paradigm shift with the adoption of the National Education Policy. This forward-looking policy not only embraced modern pedagogical approaches but also reiterated the commitment to inclusive and equitable

education for all, recognizing the unique needs of students with disabilities. In essence, the tracing of policy trends on disability in the school system reveals a narrative of continuous progress, reflecting a societal commitment to creating an educational landscape that leaves no one behind.

Institutional Frameworks for Inclusive Environment

In the realm of inclusive education policies, the government assumes a central role, recognizing the imperative to address the unique needs of children with disabilities. It involves a comprehensive approach, starting with the cultivation of an inclusive culture that underscores the potential and capabilities of these children. The goal is integration into the broader societal framework, emphasising their role within the "abled society" rather than relegating them to a segregated category labeled "special abled."

Practical implementation of inclusive practices is crucial which encompasses a multifaceted approach, beginning with the accessibility of educational institutions. The location of school which strategically positioned in close proximity to communities and residences of disabled children with featured infrastructure may be designed for seamless accessibility. Maintaining an optimal student-teacher ratio is paramount with resource teachers who are designated in every school. There is a requirement of concerted efforts to be made for raising awareness among general teachers, policy makers, and educational departments regarding disabilities and effective handling strategies. Additionally, the presence of physiotherapists and occupational therapists within schools ensures holistic support for the diverse needs of children with disabilities.

Curriculum development needs a flexible and collaborative approach where resource teachers actively contribute to crafting a curriculum that accommodates the varying abilities of students with disabilities. Rigorous testing precedes the implementation of these curricular adaptations, ensuring their efficacy in meeting the educational needs of every child. In the digital realm, initiatives like *Sugamya Pustakalaya* showcase a commitment to inclusivity in the form of online library. It was aligned with *Sarva Shiksha Abhiyan* and provided diverse collection of books accessible to blind individuals. Membership requires a disability certificate, a validation process overseen by the librarian, ensuring that the resources are directed to those who genuinely benefit.

The success stories in the real world, exemplified by programs like the APD's Community Learning Center in Bangalore since 2007, serve as concrete proof of the effective implementation of inclusive policies. This initiative follows a comprehensive approach, encompassing identification processes, personalized education plans, strategic resource allocation, engaging learning activities, and events tailored for the holistic development of children with disabilities.

Notably, the program actively fosters awareness, skill enhancement, and the seamless integration of these students into both mainstream and special schools. A dedicated team of trained professionals plays a crucial role in facilitating this integration. Going beyond academics, the program extends support through therapies, provision of

mobility aids, and clinical assistance, ensuring the overall well-being and progress of these children.

Furthermore, the initiative includes capacity-building endeavors, incorporating both residential and external training programs. These initiatives not only provide exposure but also create opportunities for growth in alignment with the overarching vision of inclusive education. In conjunction with these grassroots efforts, Table 1 provides an overview of various government initiatives designed to address the educational needs of individuals with disabilities in the Indian context.

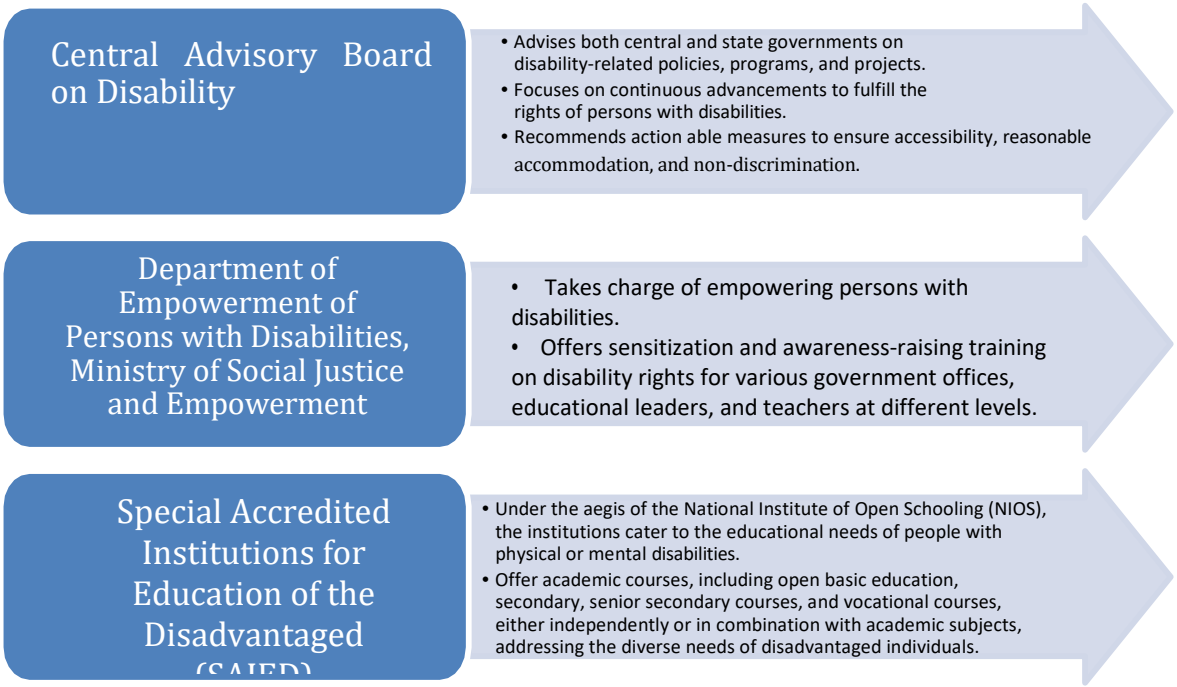
Disabled children face significant barriers to education, with limited progression beyond primary school and only 9% completing secondary education. A staggering 45% of disabled individuals are illiterate, and merely 62.9% of those aged 3 to 35 have ever attended regular schools. Disparities exist among disability categories and genders, notably affecting children with autism, cerebral palsy, and girls with disabilities, who are less likely to be enrolled in schools. (Sarkar, T 2020)

Access to preschool and primary education is particularly inhibited by disabilities, impacting a child's educational journey. Additionally, the lack of infrastructure poses challenges, as less than 40% of school buildings have ramps, and only around 17% have accessible toilets. Despite the National Education Policy's emphasis on technology, only 59% of schools nationwide have access to electricity. (Sarkar, T 2020)

The Rights of Persons with Disabilities Act 2016 underlines the obligation of educational institutions to offer "reasonable accommodation in accordance with individual needs and necessary support, whether individualized or otherwise, in environments fostering optimal academic and social development aligned with the objective of complete inclusion." However, a critical observation from a May 2020 review by the Vidhi Centre for Legal Policy highlights the absence of detailed explanations for crucial terms like 'reasonable accommodation,' 'individualised support,' and 'full inclusion.' This lack of clarity introduces the potential for arbitrary implementation, emphasizing the need for a more precise delineation to ensure the effective realization of inclusive practices within educational settings. Wexler (2009) finds that it is necessary to honor their idiosyncrasies-their daydreaming, their lack of concentration rather than expecting conformity.

Several key institutions play crucial role in spearheading disability initiatives and addressing the diverse needs of individuals with disabilities as illustrated in Figure 2.

Figure 2: Key Institutions Enabling PwD



These institutions collectively form a robust framework, addressing various aspects of disability initiatives, from policy formulation and education to empowerment and inclusion.

The Rehabilitation Council of India (RCI) Act witnessed significant shifts in the narrative surrounding disability rehabilitation and education. The enactment of the Rights of Persons with Disabilities Act, 2016, expanded RCI's responsibilities to encompass a more multi-sectoral role. With legally mandated disabilities increased from seven to twenty-one, the education paradigm for persons with disabilities evolved from unidirectional special education to a multi-directional approach, incorporating inclusive education as a viable choice (Section 31).

RCI acknowledges these changes and undertakes various tasks to address contemporary challenges. The Central Rehabilitation Register (CRR) maintains a record of over 1.47 lakh professionals/personnel with RCI-approved qualifications in disability rehabilitation and special education. It actively prescribes minimum standards for education and training, fostering continuing Rehabilitation Education programs to enhance the skills and knowledge of professionals/personnel. The Council, recognizing the dynamic nature of the field, standardises and updates training courses, currently offering 60 courses ranging from certificates to master's and above levels.

Continuing Rehabilitation Education (CRE) remains a priority for RCI, approving seminars, conferences, workshops, and other programs to upgrade the knowledge and skills of in-service professionals. Over 1000 programs are organized annually by

approved training institutes. In response to the evolving educational landscape, it has ventured into Open and Distance Learning (ODL), collaborating with 14 State Open Universities to launch the B.Ed. Spl. Ed. (ODL) course in various languages.

The Council ensures the quality and fairness of special education and disability rehabilitation programs through diligent monitoring. Visiting experts, surprise inspections, and delegated responsibilities to Zonal Coordinators contribute to the oversight of courses and examinations conducted across RCI-approved institutions nationwide. RCI, as the sole statutory body in India, remains committed to preparing, promoting, and facilitating the development of human and material resources for disability in alignment with the changing needs of the sector.

It is actively engaged in both short and long-term initiatives to address Special Education Needs (SEN) for children. This involves implementing modular programs, including basic braille and sign language, both online and offline. The focus extends to alternative curricula and pre-vocational modules for children with intellectual disabilities across various programs. Additionally, it emphasises on a tiered Continuing Rehabilitation Education (CRE) approach on inclusive education, covering curriculum adaptation, differentiated instruction, alternative evaluation, and Universal Design for Learning (UDL) for teachers. Mental health and social-emotional well-being are also addressed through counselling initiatives.

RCI focuses on promoting inclusive and adapted sports and recreation programs, specifically addressing learning disabilities. They implement interventions across various settings, including standalone courses, short-term programs, CRE, and add-ons to existing training courses. Short-Term Courses (STCs) are designed for self-learning, incorporating Teaching Learning Materials (TLMs) in multi-sensory modes. A cross-disability and inclusive approach is maintained, and an Expert Committee on Inclusive Early Childhood Education (IECE) aims to develop cross-disability courses. RCI is working on transitioning all disability-related courses to Open and Distance Learning (ODL) mode at the B.Ed. level, utilizing multi-sensory TLMs for conditions like cerebral palsy and autism spectrum disorder. Similar measures are applied to courses in Inclusive Education, Inclusive Early Childhood Education, and Mental Illness. The goal is to create a comprehensive web repository for resources in disability rehabilitation.

In addition, the administrative bodies such as State Nodal Agency Centre (SNAC); State Level Coordination Committee (SLCC); Local Level Committee and Registered Organizations (RO) play a pivotal role under the National Trust for inclusive practices for CwSN. SLCC is not formed in a few states namely Arunachal Pradesh, Chhattisgarh, Goa, Maharashtra, Telangana, Andaman & Nicobar, Dadar & Nagar Haveli, Daman & Diu and Lakshadweep.

Best Practices for Inclusion: International and National Perspectives

At the national level, several innovative initiatives have been implemented to enhance inclusivity and address the unique needs of specially-abled children in India. One such initiative is Saksham's Assistive Technology Integration, which introduced a tailored tablet-based learning program in Delhi, providing visually impaired children with interactive audio content, braille displays, and voice commands. This has significantly improved accessibility and enriched learning experiences, breaking down barriers to education. In Chennai, Vidya Sagar has established inclusive learning spaces, featuring adaptable furniture, sensory stimulation tools, and inclusive teaching methods to cater to the diverse needs of differently-abled children.

Enable India focuses on skill development and vocational training, empowering differently-abled youth for employment opportunities. Special Olympics Bharat organizes inclusive sports events, promoting physical fitness, social inclusion, and boosting self-esteem among children with intellectual disabilities. Additionally, Bookshare India contributes to inclusivity by offering a vast collection of accessible digital books, ensuring equal access to educational resources and promoting literacy among visually impaired and dyslexic children. These case studies exemplify a comprehensive approach to fostering inclusivity and addressing the unique challenges faced by specially-abled children across the country.

Internationally, a range of innovative initiatives have been dedicated to supporting specially-abled students and enriching their educational journeys. In the mid-20th century, American Sign Language (ASL) gained recognition as a legitimate language with syntax and grammar, thanks to the research of William Stokoe Jr. Total Communication emerged as an approach combining signed language and speech, using various methods like speechreading, speech therapy, and hearing aids. While ASL was gaining credibility, many opted for Signed Exact English (SEE), introduced in 1971, which is not a language but a visual coding system. SEE translates ASL into English structure, allowing teachers to provide signed interpretations while students use speechreading and their remaining hearing to understand.

Presently, Universal Design for Learning (UDL) is at the forefront, reshaping curriculum design with a focus on accommodating diverse learning needs through multiple means of representation, engagement, and expression. Microsoft's Learning Tools, integrated into Office 365, exemplify assistive technology by offering features like immersive reading and text-to-speech, providing crucial support for students with dyslexia and other learning differences. Notable online learning platforms such as Coursera and edX have embraced accessibility features like subtitles and adaptive interfaces, ensuring that quality education is accessible to students globally, regardless of their abilities.

SENse Learning introduces an innovative approach using virtual reality to create customizable sensory environments, particularly benefiting students with sensory processing disorders. The e-NABLE Community represents a global collaboration platform utilizing 3D printing to provide affordable prosthetic hands for children

worldwide, demonstrating how technology and collaborative efforts can enhance the quality of life for those with limb differences. These initiatives collectively underscore the international commitment to leveraging innovation and inclusivity to empower specially-abled students on a global scale.

Role of Key Stakeholders in Creating Inclusive Environment

In situations where a child finds themselves disconnected from their surroundings, parents, mentors and teachers are tasked with the challenge of identifying a point of departure. This involves understanding and leveraging the child's embodied experiences, creating a foundation from which their learning journey can be extended. The mentor's role becomes crucial in navigating this circumscribed environment, finding innovative ways to connect with the child and facilitate a more comprehensive and inclusive learning experience.

Inclusive education embodies practices that aim to empower every member of a school community as both a teacher and a learner. Through these practices, children are encouraged to view themselves and their peers as capable individuals on a learning journey, fostering thoughtful and purposeful engagement with the world. In this perspective, achievement and competence are gauged by learners' capacity to set goals and pursue actions that align with their life aspirations. These pursuits may involve ongoing education, professional growth, vocational exploration, pursuing passions, and overall, striving for a fulfilling life (Shapiro, A & Baglieri, S. 2017)

The National Education Policy (NEP) 2020 addresses crucial aspects of teacher education, preparation, and service conditions with a specific focus on catering to the needs of children with disabilities. It introduces short-term specialization courses dedicated to teaching children with disabilities and incorporates modules on this subject within existing teacher training programs. Teachers will gain more autonomy in selecting pedagogical tools tailored to their classroom contexts and will be relieved from non-teaching tasks. Furthermore, the NEP emphasizes training teachers to recognize and identify various disabilities, especially specific learning disabilities.

Recognizing the significance of these policies is paramount. Numerous studies have highlighted the challenges faced by teachers in inclusive classrooms, where lack of competence, training, infrastructure, and support often hinder effective education for children with disabilities. Teachers, at times, find it challenging to align with inclusive education policy in their classroom practices, contributing to a perception that children with disabilities may be burdensome or distracting.

However, the success of these policies hinges on the availability of well-prepared teacher educators. Notably, the policy doesn't advocate for regularizing special educators as teachers but views special education as a specialization for general teachers. It also underscores the need for greater alignment between the National Council for Teacher Education (NCTE) and the Rehabilitation Council of India (RCI) to ensure that special educators possess both content and pedagogical knowledge. These addresses identified gaps and concerns voiced by both general teachers and special

educators, particularly regarding their hiring conditions, pay, and working environments.

An essential point about curricula and examination systems is teacher's perspectives about changing the parent's and the school's expectations of children's academic performance. Teachers from various pockets hold the view that the school's and parent's expectations of the SEN children's academic performance need to altered. The progress of SEN children cannot be measured against the regular children; also the educational departments should relieve teachers from the stress of maintaining a fixed minimum standard of achievement for all students. Only by taking such drastic measures the teachers will be able to focus on what truly matters, the betterment of SEN children. (Hassanein)

Pierre Bourdieu introduced the concept of cultural capital as tools for acquiring symbolic wealth deemed socially valuable. Initially, this notion, notably Bourdieu's interpretation, centred on the acquisition and expression of knowledge in "high" cultural domains like abstract art or classical music. Scholars argue that these seemingly arbitrary forms of knowledge underpin class privileges transmitted across generations, with children from privileged backgrounds naturally developing elite cultural capital through educational opportunities and distinctive family environments.

The original concept suggests that students from privileged backgrounds excel not only due to better academic skills but also because they display elite cultural traits not typically part of the school curriculum. While academic criteria favouring these elite traits are class- biased, they apply universally, contributing to the reproduction and legitimation of privileged advantages within the educational system. This phenomenon, where social hierarchies are perceived as natural and necessary, is termed "misrecognition" by Bourdieu, with the educational system playing a pivotal role in sustaining it.

Additionally, disadvantaged parents face barriers to involvement in their children's education, such as logistical difficulties and societal expectations. These circumstances not only impede their engagement with the educational system but also limit their accumulation of cultural capital, hindering their understanding of educational discourse and practices.

According to Dierenfield, B., deafness is not a fate that the majority of hearing parents would intentionally choose for their children. However, the perspective has evolved, and since the mid-twentieth century, changing attitudes towards disability, advancements in assistive technologies, including cochlear implants, and improvements in the education of deaf students have expanded the possibilities for leading a fuller and more productive life despite hearing impairment. Parents with higher education levels, not only embrace sign language but also actively engage in studying and considering various developmental options for their deaf children, supplementing formal training and education at home.

In the context of general education, parent's involvement is often based on their academic strengths and communication skills. Shifting focus to parents of children with disabilities, the complexities they face are multifold. In order to meaningfully impact their children's education, these parents often need knowledge about disabilities and suitable educational approaches. While some parents can educate themselves through reading, attending lectures, or engaging with various informational sources, those with low cultural capital may face challenges even in recognizing the issues at hand, further exacerbating educational disparities. (Ong-Dean, C 2009)

Issues and Challenges

A significant challenge in the educational framework arose from the lack of alignment between the 2009 Right to Education Act (RTE) and the Rights of Persons with Disabilities Act (RPWD)' 2016, creating a contentious issue. The 2012 RTE amendment allowed for the enrollment of children with disabilities in neighbourhood schools, introducing a separate provision for those with severe disabilities who may opt for home-based education. In contrast, the RPWD recognized the right of children with benchmark disabilities to choose between neighbourhood schools and special schools, leaving the issue of home-based education unaddressed.

Attempting to address this discrepancy, the National Education Policy (NEP)' 2020 has taken a decisive stance by acknowledging all three options – neighbourhood schools, special schools, and home-based education – as viable choices for the education of children with disabilities. This clarification in the NEP aims to resolve ambiguities surrounding school choices and promote inclusivity in the education of children with disabilities.

Further, Rehabilitation Council of India (RCI) is actively advancing its Plan of Action for 2020-2030, orchestrating key initiatives through the establishment of four new committees. At the forefront is the Overarching and Cross-Disability Committee, overseeing nine sub-committees, each led by a member of the main committee. One of these sub-committees is dedicated to crafting material for a cross-disability Inclusive Education full-time course, spanning D.Ed., B.Ed., and M.Ed. levels. The structure, norms, eligibility criteria, and full text will be collaboratively authored by experts identified within this group.

Another significant sub-committee will focus on developing material addressing Specific Learning Disabilities across various contexts, including a one-year diploma, short-term modules (15 days), CREs of 3-6 days, and integration as an add-on to existing training courses. Concurrently, separate groups will tackle the creation of materials for Vocational Training/Skilling for individuals with Developmental Disabilities and for Sign Language and Braille. These materials will cater to diverse settings, encompassing one-year diplomas, short-term modules (15 days), and CREs of 3-6 days.

Complementing these actions, RCI will establish four expert committees: one dedicated to Inclusive Early Childhood Education, another to E-learning, a third focused on Research, and the fourth addressing Developing Quality in Disability Education and

Monitoring Mechanisms. These comprehensive efforts reflect RCI's commitment to advancing inclusive education and enhancing the quality of disability education through strategic planning and collaborative initiatives. These initiatives of RCI are in line with the aim of inclusive education.

Rather than emphasizing sameness to avoid uncomfortable discussions, inclusive educators take action to educate themselves and others about diverse social identities. By recognizing and embracing differences, education becomes a tool to preserve individuality, highlight human diversity, and build enriching communities based on respect and appreciation for others. (Shapiro, A & Baglieri, S.)

Critical approaches to multicultural and diversity curriculum aim to ensure that all students not only learn from diverse perspectives but also find value in various ways of knowing. Inclusive teaching goes beyond this by actively honouring the specific diversities within a school and class community. Learning communities embracing student diversity approach differences openly, viewing conflicts as opportunities for collaborative problem-solving.

Recognizing that all learners have both strengths and needs, as well as unique characteristics and identities, inclusive education encourages students to express their uniqueness. The curriculum provides opportunities to explore social or identity groups, fostering a sense of belonging, pride, and developing advocacy skills. Refraining from using terms like "special needs" and embracing disability-positive language allows children with disabilities to engage in self-advocacy and work towards understanding their strengths and limits.

Embracing difference extends beyond multicultural and diversity curriculum; it involves acknowledging the particular funds of knowledge and cultural resources drawn upon by individuals. Inclusive educators purposefully support children in finding identity and value in themselves, promoting concepts like disability pride, body positivity, LGBTQ pride, feminism, heritage and language pride, and positive racial identity.

Way Forward

The progress towards inclusive education in Indian schools is marked by supportive national legislation and policies, notably exemplified by the National Education Policy (NEP) and the Rights of Persons with Disabilities Act (RPWD). The NEP emphasises equal opportunities and inclusive education, incorporating provisions for non-discrimination, accessible infrastructure, reasonable accommodations, and specialized support for students with disabilities. It further encourages the use of Braille and Indian Sign language, the recruitment of special educators with cross-disability training, and the integration of disability awareness into teacher education. The RPWD Act defines inclusive education as a system where students with and without disabilities learn together, aligning with the social model of disability. It provides directives for leaders within the education system on fostering inclusive learning environments at different levels.

Nonetheless, challenges persist. Limited data collection, underreporting of disabilities, and the need for renewed efforts, including increased budgetary allocation, coordinated inter-departmental efforts, ending the segregation of disabled children, and facilitating sustainable transitions to higher education and employment, are essential to fully realise the vision outlined in the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD). Moving forward, a comprehensive and collaborative approach is crucial for the effective implementation of inclusive education policies in India.

References

Ainscow, M. (1999). Understanding the development of inclusive schools. London: Falmer Press.

Avramidis, E., & Norwich, B. (2002). Teachers' attitudes towards integration/ inclusion: A review of the literature. European Journal of Special Needs Education, 17(2), 129-147

B, Susan. & Shapiro, A.(2017). Disability Studies and Inclusive Classroom, Critical practices from embracing diversity in education. Routledge. NY and London.

Dierenfield, B.& Gerber,D.(2020). Disability Rights and Religious Liberty in Education. University of Illinois Press.

Farrell, P. (2004). School psychologists: Making inclusion a reality for all. School Psychology International, 25(1), 5-19.

Hassanein, E.(2015).Inclusion, Disability and Culture. Sense Publishers. The Netherlands.

Hausstätter, R. (2004). An alternative framework for conceptualizing and analysing special education research. European Journal of Special Needs Education, 19(3), 367-374.

Leyser, Y., Kapperman, G., & Keller, R. (1994). Teacher attitudes toward mainstreaming: A cross cultural study in six nations. European Journal of Special Needs Education, 9(1), 1-15

Oliver, M. (1996). Understanding disability: From theory to practice. New York: St. Martin's Press.

Ong-Dean, C.(2009). Distinguishing Disability, parents, privilege and special education. The University of Chicago Press. Chicago and London.

P, Karen. et al.(2013).Purpose, Process and Future Direction of Disability Research. Sense Publishers. The Netherlands.

Sarkar, T. (2020). Examining Disability Inclusion in India's New Education Policy. The Education and Development Forum. https://www.ukfiet.org/conference/ukfiet-conference-2023/

Singhal, N.(2009). Education of children with disabilities in India. UNESCO. https://unesdoc.unesco.org/ark:/48223/pf0000186611

Singhal,N. et al.(Edited).(2019). Education and disability in the global south. New Perspective from Asia and Africa. Bloomsbury Academic .NY

Uditsky, B. (1993). From integration to inclusion: The Canadian experience. In R. Slee (Ed.), Is there a desk with my name on it? The politics of integration (pp. 79-92). London: Falmer Press.

UNESCO (2019) *N FOR NOSE State of the Education Report for India 2019 Children with Disabilities* published by UNESCO New Delhi Cluster Office for Bangladesh, Bhutan, India, Nepal, the Maldives, and Sri Lanka.

UNICEF.(2021). Disability Inclusive Education Practices in India. The UN. Nepal.

Ware, L. (2001). Writing, identity, and the other: Dare we do disability studies? Journal of Teacher Education, 52 (2), 107–123.

Wexler, A.(2009). Art and Disability The Social and Political Struggles Facing Education. Palgrave Macmillan. NY.

Wills, R. (Edited) (2014).Tales from School Learning Disability and State Education after Administrative Reform. Sense Publishers. The Netherlands.

Aligning Literacy Challenges: An examination of Dyslexia within India's National Education Policy 2020.

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Abstract

Dyslexia is known to be one of the most significant learning disabilities. Dyslexic students face multiple challenges. NEP, 2020 envisages a number of policy measures to address dyslexia and other learning disabilities through inclusive education. This paper explores important issues and challenges in fostering inclusive education for dyslexic students. Apart from an analytical discussion on the theoretical perspectives on dyslexia, this paper explores variety of support systems that can be administered as policy interventions to achieve inclusive education for dyslexic children.

Keywords: Dyslexia, Inclusive Education, NEP 2020, learning disabilities, Literacy

Dyslexia is a neurological condition wherein a dyslexic individual has different neurological system to process information and acquire knowledge often through creativity, visual-spatial reasoning and problem solving. Thus a dyslexic person possesses different abilities for acquiring and accumulating knowledge. So, dyslexia does not manifest intellectual or cognitive abilities.

Abilities of dyslexic individuals may further be augmented by sharpening their particular strengths. In this regard, in India, the Rights of Persons with Disabilities Act, 2016 is the first to recognise the Special Learning Disabilities (SLDs). The Act accords right to education and employment for the people with SLDs.

The New Education Policy (NEP), 2020 as well as several other policies of the government of India has incorporated the provisions of the RPWD Act for people with SLDs in letter and spirit.

Until now, Indian education system had no separate provisions to support the educational needs of the students with dyslexia. While in India, so far merely three

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universities have made only some adjustments for dyslexic students, top 100 universities in USA have been providing adjustable curriculum and assessment system for the students with SLDs. For example, dyslexia is so common at the Massachusetts Institute of Technology to that it's is commonly know there as the MIT disease.

Children with Special Learning Disabilities (CSLDs) face multiple challenges. For example:

1. Indian society lacks awareness and understanding about dyslexia because of which it becomes difficult to recognise early symptoms. Does due to delay in identification and diagnosis interventions are delayed and the development of such children is hampered.
2. Apart from societal awareness, there is also lack of trained specialists to diagnose special learning disabilities and to provide appropriate assistance and guidelines. Further, there is lack of necessary assistive technology.
3. In India, Children with SLDs often fail to achieve even proper school education due to the fact that traditional teaching methods are not suitable to their learning requirements. Such children are likely to learn from a pedagogy based on visual and kinaesthetic learning approaches.
4. In India, learning problems of dyslexic children are often further increased due to the presence of a multilingual environment particularly with the writing structure and sound of different languages and their scripts.

The NEP, 2020 has taken significant steps towards inclusive education in general and the educational requirements of CSLDs in particular. In order to improve the learning experiences of CSLDs the NEP focuses on early identification of disability through regular screening and assessment ideally in the prescribed years.

Another remarkable step towards inclusive education for CSLDs in the NEP, 2020 is an emphasis on the need for an environment where CSLDs learn alongside their peers without any discrimination. In this direction, the curriculum will be made adjustable toaccommodate the learning piece and pattern of CSLDs. A wider range of subjects and diverse learning technology and materials are to be offered to them. Use of assistive technology such as screen readers, augmentative communication devices and specialised software's to assist learning will be encouraged for the better learning environment for CSLDs. Apart from that, teachers will be trained to support peer divorce learning environment more effectively. Furthermore, special educators will provide necessary support and guidance to the CSLDs.

By implementing these solutions collaboratively, we can create a more supportive and inclusive environment for dyslexic children in India, enabling them to thrive and reach their full potential. Remember, progress requires a multi-pronged approach, involving advocacy, resource allocation, education reform, and community engagement. By working together, we can help bridge the gap and ensure that every child with dyslexia has the opportunity to succeed.

DYSLEXIA (Global Viewpoint)

Asia represents an entirely different entity in its complexity vis-à-vis dyslexia for at least two major reasons. First, not only are there many more languages represented in Asia, but there are many more scripts as well. For example, in India alone, there are approximately 22 languages written in 13 different scripts.

Second, it is important to define dyslexia in a coherent way, and for some children, this may pose a problem because of issues related to diglossia and government and school requirements. More than 50% of the world's population learns to read in a language that is not the child's mother tongue (McBride, 2016).

Theoretical Perspective

Bronfenbrenner's Ecological Systems Theory (1979) critical as a way in which to conceptualize dyslexia in Asia. In order to understand dyslexia fully, we consider it at the levels of different systems, beginning with the microsystem, which encompasses the child's individual relationships with important others who directly influence his or her literacy skills and ending with the macro system, or focus on culture, and chrono system, highlighting our current historical period. This is quite an exciting and dynamic period in which to be considering the concept of dyslexia.

Microsystem: There is no doubt that the microsystem that is most proximal to the developing child is the family, including parents, siblings, and other family members and caregivers, as well as literacy resources children can access in the home. It is now well established that home literacy environment (HLE) plays an important role in children's literacy acquisition (Silinskas et al., 2010).

It should be noted, however, that there is a great deal of diversity in HLE across Asian societies depending on various factors, including both exo-system (e.g., educational system, home language) and macro system factors (culture, language, script, social expectations). For example, families in upper middle- to high-income societies generally have more literacy resources at home than those in low-income societies (Chiu et al., 2012).

Mesosystem: The mesosystem highlights the fact that microsystems for an individual can either interact harmoniously or in conflict. The best example of this in relation to reading difficulties is probably a consideration of how teachers and parents view students. Children with dyslexia often suffer from low self-esteem (McArthur et al., 2021). When teachers and parents agree that the child is working hard and requires extra support and understanding, the child with dyslexia is likely to make optimal progress.

Exosystem: Entities separate from the child, or student, such as governments and schools which create policies that influence literacy instruction or the diagnosis of dyslexia, constitute the exosystem. The term "exosystem" is important because it highlights the fact that such entities are external to the developing child. Although government or school policies clearly influence students in their learning, students do

not have a direct effect on such entities. An example, The Indian Government's National Policy on Education, first published in 1968, proposed the three-language-formula.

The Three Language Formula is more of 'a consensus strategy' (Jhingran, 2009) rather than an implementable national policy. In the majority of the private schools, English is taught as the prime language.

The National Education Policy 2020 has retained this recommendation, namely, that students in India will learn three languages in their schools; at least two of these should be languages native to India and one should be (preferably) a regional language. There may be variations based on the state and its linguistic diversity and the preferences of students. According to the NEP 2020, "wherever possible, the medium of instruction until at least Class 5, but preferably till Class 8 and beyond, will be the home language/mother tongue/local language/regional language." and this will be applicable to both private and public schools.

One can imagine that this three language policy is difficult for all children, particularly given additional challenges of teacher and textbook language matches. For a child with dyslexia, literacy learning may be an even more daunting task.

Macrosystem: The relatively high status of English in teaching and learning in India is one example of the macrosystem, which encompasses the culture experienced by the child. Scripts taught in schools are another. The orthographies of modern languages of India share the primary features of Brahmi script, whose basic unit is known as the 'akshara.' Most of these languages are alphasyllabary, and formation of words is a result of meaningful sequencing of aksharas (Patel, 2004). This arrangement follows a fixed set of rules. Reading acquisition in these languages requires a unique orthographic representation and understanding for proficient reading development (Padakannaya & Mohanty, 2004). It follows a 'simple to complex' order (Karanth & Prakash, 1996; Padakannaya, 2003).

Chronosystem: Examples from both India and Malaysia illustrate fundamental challenges of literacy learning and identification of dyslexia in Asia. The chronosystem refers to the historical period and events encompassed within it. In recent history, the prominence of English as a foreign language important for status and jobs has grown in Asia (Chang, 2011; Hu & McKay, 2012). With it, the importance of learning to read in English has arguably increased. Correspondingly, those with particular difficulties in learning to read and to write in English may suffer more than was previously and historically the case in Asia.

It should be noted, however, that there is a great deal of diversity in HLE across Asian societies depending on various factors, including both exosystem (e.g., educational system, home language) and macrosystem factors (e.g., culture, language, script, social expectations) Cheung et al., 2021; Nag et al., 2019.

The National Education Policy (NEP) 2020 has taken steps to address dyslexia and other learning disabilities through inclusive education. The NEP 2020:

· Allows children with disabilities to enrol in school, and teachers can choose tools to suit their students' needs.

· offers short-term specialization courses for children with disabilities. · Establishes the National Assessment Centre, PARAKH.

· Focuses on "Equitable and Inclusion: Learning for All"

· Modules on teaching children with disabilities: Within existing programs. · Greater autonomy in selecting pedagogical tools: Relevant to classroom contexts

· Training to recognize and identify disabilities: Particularly specific learning disabilities.

· Flexible curricula: To leverage each child's strengths.

· Use of appropriate technology: Enabling children to work at their own pace. · Focus on students learning in their home languages: High quality textbooks in different languages.

Support Systems for Students with Learning Disabilities

Early Identification and Diagnosis

Early identification and diagnosis of various learning disabilities are crucial for implementing appropriate interventions. Children with SLDs usually have noticeable symptoms. For example, persistent difficulties in learning specific academic content or some unusual behavioural patterns. So, parents, teachers and educational professionals should be vigilant to notice such symptoms for an early detection of SLDs. In case such symptoms are observed in any children, professional evaluation may be carried out by specialists, such as educational psychologist, to identify SLDs. It will help in an early diagnosis of SLDs.

Individualised Education Plan

Individualised Educational Plans (IEPs) are designed to provide for the unique equirements of individual CSLD. IEPs provide a roadmap to support the academic progress of such students. IEPs may include provisions for extended time for exams, preferential seating arrangements, assistive technologies and specialised instructions customised for the special needs of each CSLDs.

Classroom Accommodations

Classroom accommodation can play transformative role in the learning environment for the CSLDs. Classroom settings may be modified suitable to meet the individual needs of the CSLDs. For example, breaking down of complex tasks into smaller and manageable steps and visual aids, such as charts and diagrams, for effective learning for CSLDs. Additionally, alternative modes of assessment and preferential seating arrangements may be provided for comfort and better orientation of the CSLDs.

Assistive Technology

Assistive educational technologies, such as softwares, apps or devices are designed to assist in learning. These technologies can enhance learning in classrooms and compensate for learning deficiency in CSLDs. Dyslexic students with difficulty in reading may benefit from text to speech software and children with dyshraphia may benefit in writing tasks from speech recognition software. Students can organise their thoughts and ideas using graphic organisers and using tablet and computers with accessibility feature can easily access the digital content.

Inclusive Classroom Environment

An inclusive and supportive learning environment is crucial in educational institutions for better learning of the CSLDs. Teachers can create an empathetic environment in the classroom by spreading awareness about different types of learning disabilities. It will also help in creating an inclusive mindset in the classroom. Further, communication on the issues between students teachers and parents can be highly beneficial in identifying and addressing concerns through discussions on individual needs. Group and cooperative learning can help in mutual support and learning through collaboration. Individualised attention through different ways such as one-to-one or small group instructions can help even more in this direction.

Conclusion

In the present time, dyslexia has emerged as one of the most widely recognised learning disabilities in the world. Students with SLDs in general and dyslexia in particular require an inclusive learning environment and specialised intervention to meet their specific needs and challenges. An inclusive learning environment can be created by adopting an empathetic approach towards individuals with SLDs. An early detection of disability and appropriate assistance can help the CSLDs to overcome their challenges and in leading a better life. NEP, 2020 has envisaged several policy interventions to address learning difficulties for students with dyslexia and other SLDs. Further, society, parents and teachers can provide a supportive and enabling environment to them. We can create a society that values the special talents and difficulties of individual with SLDs with more knowledge and access to resources. Through collaboration with professional, support organisation and community programs the government can ensure that students with SLDs. receive the necessary guidance and resources to succeed academically and personally.

References

Cheung, S. K., Dulay, K. M., Yang, X., Mosheni, F., & McBride, C. (2021). Home literacy and numeracy environments in Asia. Frontiers in Psychology, 12:578764. https://doi.org/10.3389/fpsyg.2021.578764

Chiu, M. M., McBride-Chang, C., & Lin, D. (2012). Ecological, psychological, and cognitive components of reading difficulties: Testing the component model of reading in fourth graders across 38 countries. Journal of Learning Disabilities, 45(5), 391–405.

Dulay, K. M., Cheung, S. K., & McBride, C. (2018). Environmental correlates of early language and literacy in low-to middle-income Filipino families. Contemporary Educational Psychology, 53, 45–56. https://doi.org/10.1016/j.cedpsych.2018.02.002

Government of India. (2020). National Education Policy 2020.Ministry of Human Resource Development.

Gupta,V. (2019). A study on "Policy and Practices for Inclusion of Children with Specific Learning disability in Selected Schools". NIEPA.

Hu, G., & McKay, S. L. (2012). English language education in East Asia: Some recent developments. Journal of Multilingual and Multicultural Development, 33(4), 345– 362. https://doi.org/10.1080/01434632.2012.661434

Jhingran, D. (2009). Hundreds of home languages in the country and many in most classrooms: Coping with diversity in primary education in India. In T. SkutnabbKangas, R. Phillipson, A. K. Mohanty & M. Panda (Eds.), Social justice through multilingual education (pp. 238–262). Multilingual Matters/Channel View Publications.

McArthur, G., Badcock, N., Castles, A., & Robidoux, S. (2021). Tracking the relations between children's reading and emotional health across time: Evidence from four large longitudinal studies. Reading Research Quarterly, 0(0), 3–31. https://doi.org/10.1002/rrq.426

McBride, C. (2016). Children's literacy development: A cross-cultural perspective on learning to read and write. London: Routledge.

McBride, C. (2019). Coping with dyslexia, dysgraphia and ADHD: A global perspective. Oxford: Routledge.

Nag, S., Vagh, S. B., Dulay, K. M., & Snowling, M. J. (2019). Home language, school language and children's literacy attainments: A systematic review of evidence from low- and middle-income countries. Review of Education, 7(1), 91–150. https://doi.org/10.1002/rev3.3130

Padakannaya, P., & Mohanty, A. K. (2004). Indian orthography and teaching how to read: A psycholinguistic framework. Psychological Studies, 49, 262–271.

Retrievedhttps://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_Englis h_0.pdf

Silinskas, G., Aunola, K., Lerkkanen, M., & Raiziene, S. (2021). Parental teaching of reading and spelling across the transition from kindergarten to grade 1. Educational Psychology, 11:610870. doi: 10.3389/fpsyg.2020.610870.

Silinskas, G., Leppänen, U., Aunola, K., & Parrila, R. (2010). Predictors of mothers' and fathers' teaching of reading and mathematics in kindergarten and Grade 1. Learning and Instruction, 20(1), 61–71.

The Gazette of India: Extraordinary. (2016). The Rights of Persons with Disabilities Act, 2016,Part-II,Sec.-1,PP-1-35.

Role of Scientific Attitude in Managing Specific Learning Difficulties

Reshma P. Khan[1] & Rashmi Mehrotra[2]

Abstract

In managing the learning difficulties of students, the main role is played by their teachers and parents. Parents are more concerned about taking care of a child's well-being in social settings, but teachers have to take full responsibility for a child's academic progress. So it is the most crucial responsibility. No doubt teachers for this purpose are specially trained but in this paper, researcher want to explore the role of scientific attitude in teachers to manage children having SLD. The purpose of writing this paper is to bring to notice that scientific attitude can be proved as an asset for teachers to develop problem-solving attitude. As per the meaning of scientific attitude, it is that attitude of a person which involves scientific inquiry, curiosity, logical thinking and positive approach towards problem solving. To deal with students facing SLD, teachers should have lots of patience and problem-solving quality. Here, scientific attitude plays an important role in helping teachers manage student's problems and give them a conducive atmosphere, which helps them to develop their cognitive faculties to a great extent. Some interventions and strategies should be taught to the trained teachers, which can boost their scientific attitude and help them to become competent teachers. So in this paper, the researcher wants to explore in this direction.

Keywords: Scientific Attitudes, SLD Management, Efficient Teaching, Interventions.

Introduction

In the present scenario, teachers are considered to be nation-builders. Irrespective of type of audience, i.e., students, they are always looked upon as to guide the path of their students and take them to new horizons of success. In this particular paper, the researcher tried to explore the role of scientific attitude in managing specific learning disabilities. No doubt, when teachers deal with special children who are having SLD responsibilities, it is much more than in normal and usual classrooms. We all are aware

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that special training is needed for teachers dealing with such students. But as we are talking about inclusive education now, there is a need to train all teachers with strategies to deal with such specially abled children. In this paper, we will try to figure out how scientific attitude can be proved as an asset for teachers in managing students having SLD. The primary responsibility of a teacher is to prepare his/her students to achieve their goals and to develop their sound personalities. This is a normal expectation from

every teacher, but when we talk about children with SLD, then this normal expectation is a challenge for a teacher, and for this, a teacher should have a positive and promising attitude towards his/her students. Now here the point to be noted is that teacher's attitude directly affect students attitude. If a child is on the very high spectrum of SLD, then no doubt he/she needs medical assistance, and the efforts of the teacher alone cannot work. But with the students who are having SLDs such as dyslexia, dysgraphia, dyscalculia, etc., with patience and balanced behavior, a teacher can help his/her students to overcome such SLDs to a great extent.

Meaning of Scientific Attitude

If we talk about the meaning of the word "scientific," it means a method or inquiry that is based on observation and measurement; it is a systematic process. By The word "attitude" means an opinion about something. So now if we see together the meaning of the word "scientific attitude," it means one's opinion about something that is based on systematic observation. In other words, we can say that a person who thinks logically, who is a keen observer, and who is curious about the cause-and-effect relationship of phenomena present in our natural world. Such a person is eager to acquire wisdom and knowledge, believing that every problem has a solution. When a person thinks scientifically, his mental faculties and horizons are extended; this is a quality that makes a person accept and listen to others points of view, and he/she becomes broad-minded. This makes a person capable of handling and managing the worst situations, and he/she develops tendencies to react consistently in certain ways in novel or problematic situations.

Significance of Scientific Attitude for a Teacher

As we know, SLD is one of the most common neuro-developmental disorders, affecting 3%–10% of children. Such children are labeled as slow, lazy, stupid, or troubleshooters. Now here comes the role of teacher in managing such students to inculcate in them confidence, a positive attitude, and a sense of security and safety. So we see the role of family and the role of a teacher as very vital and important in life for such children who are suffering from SLD. Early interventions and access for such children can be proved as milestones to take them to new horizons of productive and happy beings who will know how to tackle things and can solve their academic problems to great extent. According to Samuel Kirk, "Learning disability is a process issue that can affect the language and academic performance of children and is caused by emotional disturbance, behavioral disturbance, or cerebral dysfunction.".

Educators are emphasizing the need for people to develop scientific attitudes in order to make this society rational and just. According to Anand (2002), “it has been revealed that even educated persons and scientists may not be scientific in their affective behavior." A lack of scientific attitude causes many problems in our daily lives; it also plays an important role in solving our day-to-day problems. If teacher educators develop a higher scientific attitude among their pupil teachers, it will help to bring about proper modification of their behavior, action, and thought, which in turn will impact the scholastic achievements of SLD students.

How to develop scientific attitudes in teachers: An effective teaching model helps to combine cognitive development and character building in pupil teachers. Some strategies are given in combination that can be used by teacher educators to develop scientific attitudes in their pupils, which can serve them well in their teaching careers:

- Teacher educators should encourage their students to ask questions and explore different topics of their interest to give them opportunities to relate them with real-life problems.
- Pupil teachers should be encouraged to investigate problems and reach solutions in hand on experiments.
- Pupil teachers should make frequent visits to special schools to stay in touch. with students having SLD to sensitize with their problems
- Pupil teachers should be encouraged to evaluate information critically to foster in them critical thinking to reach evidence-based conclusions.
- Pupil teachers should be encouraged to seek reliable sources of information.
- Educators should lay emphasis on teaching scientific methods to their pupil teachers to follow systematic methods to reach logical conclusions.
- Pupil teachers should acquire knowledge about how scientific discoveries have brought boom in the real world and have shaped our understanding of the world.

Quality of Teachers with Scientific Attitude: Some qualities of teachers possessing a scientific attitude in their behavior and mental level are listed below:

- They should be keen observers and can recognize individual differences among students.
- They should have self-confidence.
- They are adaptable in terms of source usage.
- They have an open mind.
- They are creative.
- They are very supportive of each and every student.
- They should have technical knowledge.
- They should be very patient and stable. They are skilled and proficient on issues.
- They are self-sufficient and humorous.

- They are active and energetic.
- They have the power of reasoning and critical thinking.

Conclusion

Necessity of identification and differentiated education for special children has been the demand of present time. So it is very important to train our teachers in such a way that they should become qualified teachers for managing children with SLD by exploring and discovering the potential of such children and to support their progress, taking into consideration their social-emotional learning and individual needs. Our teachers should be so effective and efficient that they can assist these children in becoming productive and successful human beings. Our teachers should be competent and should be able to make such children self-sufficient so that they can become successful individuals who will be self-dependent and will be able to live their lives freely without being a burden on others. No doubt children with SLD are academically lagged back from their normal age; no doubt their cognitive configuration is low, but this does not mean that they cannot lead a normal life. By little efforts and development of qualities such as scientific attitude in our pupil teachers, this problem can be solved, and such children can be able to explore and enjoy the world around them and lead a dignified life. So with the hope that this paper can throw some light on the teaching strategies of pupil teachers to successful management of children with SLD, the researcher wants to conclude her paper with the quote, “Every child is special and has a unique set of abilities; the need is just to recognize their abilities and direct them to proper direction, and except a competent teacher who can do this job.”

References

Chaudhary A K Meghwal J. A study of anxiety and depression among learning disabled children. Psychology, 2015; 5:484-6 [Google Scholar]

Kirk SA, Oxford, England: Houghton Mifflin; 1962. Educating exceptional children. [Google Scholar]

Shah HR, Trivedi SC Specific learning disability in Maharashtra: Current scenario and road ahead. Ann Indian Psychiatry 2017; 1:11. [Google Scholar]

World Health Organization: Classification of mental and behavioral disorders L clinical descriptions and diagnostic guidelines. [Google Scholar]

https://journals.scholarpublishing.org

https://typeset.io

https://www.researchgate.net

https://www.gemmlearning.co

https://www.psychiatry.org

Navigating the Essence of Pursuit of ICT Integration and Pedagogical Tools for Children with Specific Learning Disabilities

Devika Naithani[1]

Abstract

The effective synergy of ICT and pedagogical approaches acts as a tool in enriching the innovative minds of Children with Specific Learning Disabilities. This paper decodes the realms in the pursuits of Information, communication and Technology integration and Pedagogical approaches in enhancing the teaching-learning environment of Children with Specific Learning Disabilities. The focal point of this study is to investigate the transmuting combination of ICT integration and use of pedagogical appeal in inflating and increasing the classroom learning experience of the children with learning deficits. This suppositional intended to direct the dominant impression of practice of ICT and application of innovative pedagogical approaches in an inclusive learning environs. This paper shall aid as a navigating tool in revealing the effective use of strategies, and teaching methodology to address the needs of diverse learner in the inclusive classroom.

Keywords: Children with Specific Learning Disabilities, ICT, Pedagogical Approaches, Inclusive Learning Environment.

Introduction

ICD-11, Code: 6A03 defines Specific Learning Disabilities as Developmental learning disorder is characterised by significant and persistent difficulties in learning academic skills, which may include reading, writing, or arithmetic. The individual's performance in the affected academic skill(s) is markedly below what would be expected for chronological age and general level of intellectual functioning, and results in significant impairment in the individual's academic or occupational functioning. Developmental learning disorder first manifests when academic skills are taught during the early school years. Developmental learning disorder is not due to a disorder of intellectual development, sensory impairment (vision or hearing), neurological or motor disorder,

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lack of availability of education, lack of proficiency in the language of academic instruction, or psychosocial adversity.

Specific Learning Disabilities as 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 Act-2016 ,India).

Through the above stated definition it is evident enough that children with Specific Learning Disabilities do face academic challenges, and lives in constant scrutiny of various stakeholders, which makes their time during classroom hour a cumbersome one. To address such needs and challenges of these children it becomes crucial to incorporate different pedagogical styles, approaches, methods and techniques to make the learning process more effective one. Apart from poor academic performance a child with learning deficits carries the burden of lack of self-esteem, distorted self-image and self-confidence, often results in co-morbid conditions that results in maladaptive behavioural conditions such anxiety disorders, Inattentiveness, hyper active behaviour, impulsivity, conduct and mood disorders, etc. In response to this, it becomes significant to design an instructional design that assist in framing a creative learning environment that will only stimulates the senses of a child with learning disabilities but along with that boost his/her confidence. Application of innovative pedagogical style and along with that technology integration helps in fostering and building better comprehending ability about the learning concept taught in the classroom. Digital integration is a powerful tool that aid as a medium between child's perception and the knowledge building capacity. Technology integration helps in building better expressive as well as receptive skills, which are largely absent among the children with learning deficits. Inclusion of novel educational technology and devices serves a pivotal role among the children with learning disability. Technology and innovation are the need of the hour, which helps in comprehending and investigating the new learning modalities to cater the needs of students with academic challenges. They act as a bridge in the rein of passive teaching system, making it more comprehensive, active as well as equitable learning medium.In today's times, the formula of ingenious Pedagogical approaches and Technological Integration lays the foundation for a Quality Education System. It is to be considered very minutely and meticulously that a structure yet a flexible teaching-learning design is required to be generated which involves SMART Pedagogical Approaches and Technology Integration to render an effectual and operative learning conditions for children with Specific Learning Disabilities. Over the years, it has been observed that genesis of technology integration had a key role in making the classroom activities and task engaging, making it simpler and convenient and helped in evoking interest among the children not only with learning needs but also among visually impaired, ADHD, children under Autism Spectrum Disorder and so on. Digital technology had opened the pathways for learners to overcome their scholastic challenges and gave them a voice to express their understanding regarding the topic and so it can be said the technology integration and pedagogical skills and approaches go hand in hand. This

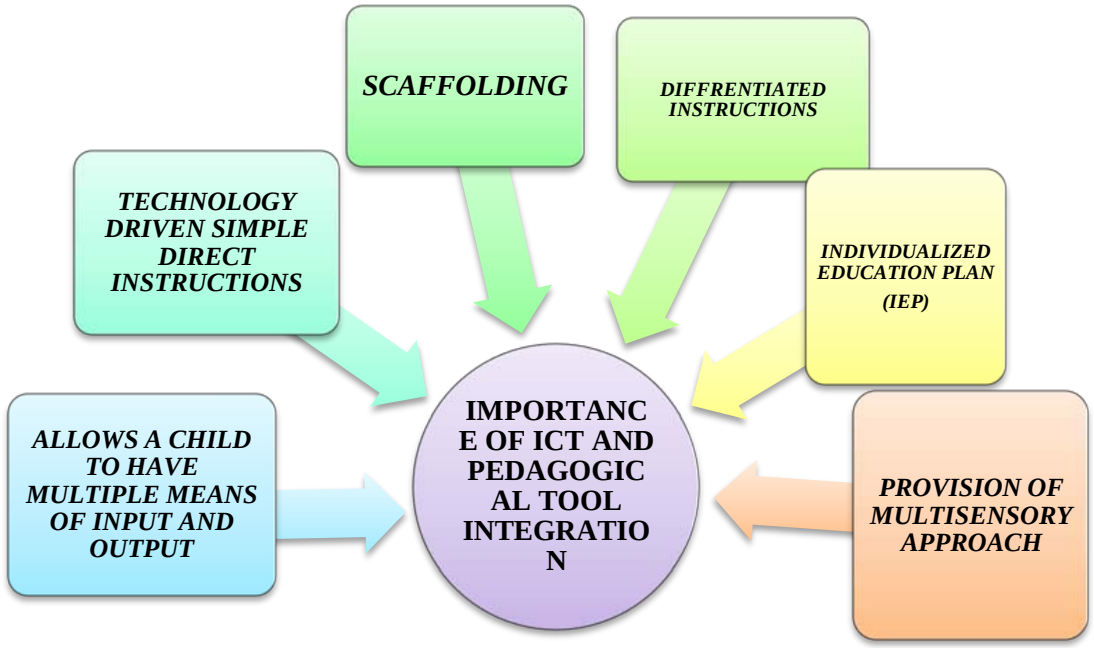
brings larger responsibilities among the educators, who have to be equipped with all the skills that are to require for teaching, that are teaching skills, pedagogical skills and soft skills. The correct amalgamation of the entire three aspects assembles a perfect recipe to cater a child with Specific Learning Disabilities. The role of technology integration plays a greater role in the life of children with learning deficits at large as it provide assistance and enhance their receptive and expressive skills like an easy-breeze.

Nevertheless, singly Technology Integration is not suffice to serve a child with learning deficits, appropriate implementation of pedagogical approaches and strategies should be provide for the aggregate growth and development of the child. It is to be accepted a child with learning challenges requires more attention and assistance in comparison to those children without any academic challenges. They require direct, simple, and straight statement in order to complete a task. The learning goals and objectives are to be designed as per the cognitive capacity of the child, hence their learning outcome shall also a realistic one, matching their abilities and assisting them to reach their optimal level. A child with learning disabilities requires a flexible, consistent, sequential pedagogical support where the mode of giving instruction is direct, and must follow a multi-sensory approach like VAKT Approach which stimulates all the sense of a child and helps in maintaining a child's interest throughout the classroom session, where a child could explore the topic via hand-on-learning which could include use of technological tools, devices and teaching-learning manipulative giving them a simulated and experiential learning environment to nurture.

Pedagogical Approaches are the techniques, methods that a teacher to uses to accommodate children in a classroom. These pedagogical approaches acts as a road map to guide the teacher to how to construct a lesson plan , so that its effective deliveries can facilitates every child in the classroom irrespective of their academic or socio-economic background. The aim of design pedagogical methods is to create a kind of teaching-learning environment that aids in addressing the need of the child. Pedagogical approaches are build keeping in mind its framework, application and classroom operation that could advance in meeting the requirements of children with and without learning deficits. Approaches such as based on Constructivism, Socio-Cognitivist, Montessori, Experiential Learning works on building a direct link of their text-book knowledge with real life situation and integration of technological or assistive devices makes the learning process more simulating one. The use of adaptive pedagogical approaches tries to make the process of giving input and receiving the learning product in a diverse manner. It is imperative for children with Specific Learning Disabilities to learn by their own experience, where they have a scope of self-correction and self-regulation which results in invoking student's interest and curiosity and accelerates their classroom involvement, eventually enriching their outlook and providing them a voice to express their understanding with concern to the topic. Such classroom pedagogical interventions not only open up window to improve their expressive and receptive abilities but along with that it build ups their collaborative abilities, cooperation which results in constructing their affective sensibility along with the cognitive senses.

New Education policy-2020 also stresses upon the need to create and implement such pedagogical styles and techniques which are inquiry based, that lays emphasis on drawing inquiry driven question, which compels children with learning difficulties to think out of the box and tends to strengthen their divergent ability to think, analyse, synthesis, create and learn something novel in context to their real-life environment.

The Impact of use of ICT and Pedagogical tools for children with Specific Learning Disabilities



Review of Related Literature

Elfakki, Sghaier &, Alotaibi (2023), investigated into the topic "An Efficient System Based on Experimental Laboratory in 3D Virtual Environment for Students with Learning Disabilities". Through this paper the researcher tried to favour the integration of artificial or virtual teaching-learning environment among children with Specific Learning Disabilities to promote and enhance their skills and standard of living. The researcher supports the use of virtual of artificial intelligence in classroom teaching-learning process as it help in creating a stimulating and simulating learning environment which are crucial to build comprehending skills and competencies among the learners. It helps children with learning deficits to craft and design their understandings as per their needs and requirement. The utilization of virtual reality among the learning deficits learners provide them huge opportunities to showcase their strength and weakness, it allows them to express themselves with respect to their learning outcomes as well as during the time of evaluation process. The researcher points out that the traditional approach tends to minimize the scope of the learners' learning output and as these

children have poor retaining and recall capacity, traditional way teaching only alleviates their challenges in their academic journey. In such scenario 3D Virtual intelligence comes to rescue for children with learning challenges, as it help in making their teaching process into reality, which could answer their why, what, how, when and where of learning in a realistic manner. To direct this issue, the investigator worked on this very concern by implementing 3D virtual reality physic laboratory classroom for the students with specific learning disabilities and the results were inspiring one, as it aided in nourishing the analytical and reasoning skills in physic experiment among the learners with learning disabilities. The research suggests in order to give such learning experience to the students it is vital to create one such to have impactful results. The study concluded that with the correct support and teaching learning material and method application, makes it easier for children with specific learning to grasp new concept more effectively and efficiently.

Woodcock, Vialle (2010), researched the topic "The Potential to Learn: Pre-Service Teachers‟ Proposed use of Instructional Strategies for Students with a Learning Disability". The current paper primary focuses on inclusion and specifically incorporation of inclusive education in mainstream education. The paper showcases the perspectives of general educators and their instructional approach to children with learning disabilities. The researcher stressed upon pre-service Australian educators and their point of view regarding the use and application of instructional methods and techniques among students with and without learning challenges. The results of the paper exhibits stark difference where the pre-service educators prefers to deliver their learning goals and objective through direct teacher-centric approach to the children with learning challenges and prefer to implement learner-Centered approach to children without learning deficits, which showcased a notable discrepancy in the cognitive skills of the learners. The statistically analysis of the study is interpreted as, which suggests that the pre-service educators depicted a certain level of biasness among the students who had higher knowledge building capacity. The study revealed the biasness on the part of pre-service educators which significantly tells the kind of instruction practiced deployed to children with learners with disability in comparison to children without challenges. The researcher suggested the urgent need to change the mind-set in concern with pre-service teachers to mould the current wave in the educational institutions. The study also indicated to raise awareness about learning disabilities and challenges related to it , to teacher, students and various members of the society and enhance inclusivity and implement it in form of way living as it is crucial to first the modify individual perspective to bring greater change in the community as whole.

Petretto, Carta, Cataudella, Masala, Mascia, Penna, Pira,& Masala (2021) researched the topic "The Use of Distance Learning and E-learning in Students with Learning Disabilities: A Review on the Effects and some Hint of Analysis on the Use during COVID-19 Outbreak". The researcher investigated about the evolving dialogues about the advantages and disadvantages in the field of education system, and specifically during the hour of covid-19 reign, where technology integration and distant learning played a significant role in showing a different mirror towards the approach to Education

environment. The study lays emphasis the impact of distance learning and online learning mode on children with learning deficits. The previous related content regarding the study stressed upon the merits and demerits on embracing digital learning and enlisting the positive effective and challenges faced during the academic operations. Through in-depth analysis of the results, it was observed that greater amount of emphasis and pain in need to be taken to address the challenges and issues faced during the distance and digital teaching practices among the learners with learning deficits and to simultaneously to read all the advantages during the course in order to understand it in context to learning disability. A major emphasis this paper highlights is the need to redefine the educational policies and moreover a shift in perspective is required among the policy makers, academician, and various other members of the society affiliated to the realm of education and rediscover the method and device adequate treatments to foster digital learning environment among children with learning needs in order to address the global educational crises. To conclude with the paper reveals multi-dimensional aspects related to children with learning disabilities and learning approach, to incorporate assistive technology , devices and learning system along with that providing a choice of attaining education such as via distance learning. The researcher recommends and suggests having more researches and study with regard to the topic, to promote and create sensitization about inclusion, Learning Disabilities, the critical role of digital or e-learning and creating an adaptive learning environment for the holistic growth and development of the child and along with that to effectively face the scholastic challenges.

Limitations and Gaps of the study:

Through investigating the various review of literature it has been observed that there is a lack of longitudinal study as many of the researches focused on the short-term learning outcomes of ICT and pedagogical Integration, and ignoring to link the other aspects such as socio-emotional, psycho-socio aspects in the researches. Another short coming that was observed was the immediate need to have comprehensive teacher training and make the efficient in the use of ICT and Pedagogical tools so as to cater the needs of children with Specific learning Disabilities

Result and Discussion

Through the related review of literature it has been observed that the role digital integration and use of varied Pedagogical Approaches plays a key role in upgrading the learning experience of children with learning needs. Elfakki, Sghaier &, Alotaibi (2023) argued to lay more emphasis on the implementation of virtual technology in order to build a stirring teaching-learning environment to construct advance tailor made curriculum design for children with Specific Learning Disabilities. Through this paper it also revealed that pedagogical approaches and digital learning has a positive result with respect to the learning outcomes of children with learning challenges. Likewise the research conducted by Petretto, Carta, Cataudella, Masala, Mascia, Penna, Pira,& Masala (2021) illustrated a substantial output with the use and operation of e- and

distance learning during the hour of pandemic. Another aspect which was observed in the related review of literature was the lack of ability to address the challenges and obstacle of children with Learning Deficits, due to the biased perspectives of educators towards children with and without special needs.

The overall study could be mapped out which suggests that technology integration and innovative of pedagogical approaches plays a significant role in enhancing the learning product of children with Specific Learning Deficits. The use of digital and pedagogical tool not only promote inclusion but also create a confirming learning environment which allows each and every child to learn at their pace and could gain significant autonomy. Although it is imperative to make modification while constructing educational policies and the method of implementation at the foundational level so that a child with learning needs could achieve greater optimal level.

References

D Petretto, S Carta, S Cataudella,I Masala, M Mascia, M Penna, P Pira, & I Masala. (2021.Sep.16).The Use of Distance Learning and E-learning in Students with Learning Disabilities: A Review on the Effects and some Hint of Analysis on the Use during COVID-19 Outbreak. Published online 2021 Sep 16. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8493828/

Elfakki,A, S Sghaier &, A Alotaibi. (2023.02.16). An Efficient System Based on Experimental Laboratory in 3D Virtual Environment for Students with Learning Disabilities. © 2023 by the authors. Licensee MDPI, Basel, Switzerland. https://www.mdpi.com/2079-9292/12/4/989

S Woodcock, W Vialle. (2010 October). The Potential to Learn: Pre-Service Teachers Proposed use of Instructional Strategies for Students with a Learning Disability. Contemporary Issues in Education Research –October 2010. Volume 3, Number 10. https://clutejournals.com/index.php/CIER/article/view/236/226

Amplifying an Inclusive Learning Environment through Assistive Technology

Dheeraj Kumar[1] & Mohd Mamur Ali[2]

"Assistive technology can never take the place of humans, but it will always be hopeful and helpful in supplementing the special needs of individuals."

Abstract

Educational institutions such as anganwadi and schools are holistic learning environments where students acquire knowledge for well-being in accordance with the developed curriculum or curricula. Even in these educational environments, some students still require specific learning resources and support. In which they can think, learn, practice and apply at their own pace and possibilities. So, these children come under special needs. For this space, assistive technology provides a new dimension of learning with keeping learners' priorities. The Assistive technology in terms of ICT based resources also increases work efficiency through its supplementing characteristics and functions like interactivity, mobility and personalized services. In this regards, "Assistive devices and technology-driven tools, along with well-designed, language-appropriate teaching materials—such as textbooks in accessible formats like large print and Braille—will be provided to support children with disabilities. This will enable them to seamlessly integrate into classrooms and interact meaningfully with both teachers and students. (NEP 2020, section 6.11, p.27). Therefore, this paper will elaborate and discuss the supplement to the needs of the special part of the society as well as a nation called children with special needs (CWSN). Further, discuss the various dimensions such as Assistive technology as academic and learning Aids, Accessibility Features of Operating Systems: Enhancing Inclusivity, Assistive Technology as Computer Access and Use, Assistive Technology as Android Mobile devices, Assistive Technology for Visual impairment learners, Assistive Technology for Oral Communication,

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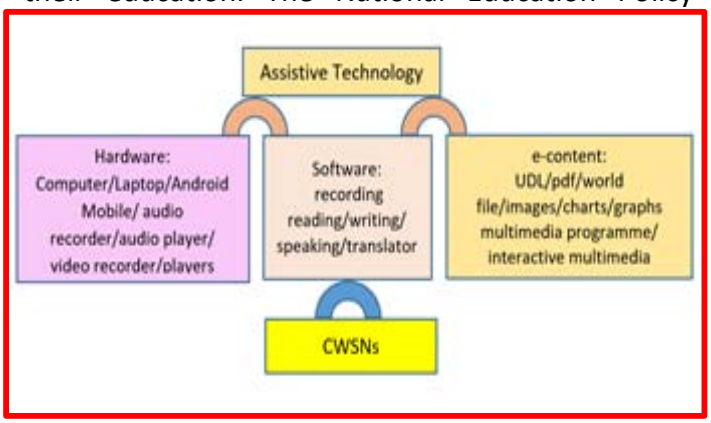
Assistive Technology for Hearing impairments, Motor and Dexterity Accessibility Features of the Assistive Technology, Assistive Technology for Cognitive Accessibility, Exploring Web Accessibility Features as Assistive Technology and UDL that reflect the sense and advantages of assistive technology in terms of ICT based resources and services.

Keywords: Assistive Technology, ICT, children with special needs, NEP 2020, inclusive learning, UDL

Introduction

Children with special needs (CWSN) require equitable and inclusive learning environments at every stage of their education. The National Education Policy acknowledges this need and emphasizes the creation of supportive frameworks to ensure that CWSN, or Divyang children, have equal access to quality education, just like all other children (NEP 2020, section 6.2.5, p. 25). There are two million two hundred sixty-six thousand seven hundred ninety-four (2266794), or about 0.89 percent, of CWSN students enrolled in Grades I to XII of the total two hundred fifty-five million seven hundred forty thousand six hundred twenty-three (2557466794) (PIB-GOI, 2022). More than two million CWSN as students learning recruitment cannot be fulfilled following assessment to identify the stages and progress of learners, learning environment, and outcomes. As a result, there is a need for assistive technology in the teaching-learning environment. Hence, Assistive technology refers to any device, equipment, or technological tool, system, or service designed to meet the unique needs of children in a structured and supportive way. It serves as an umbrella term for both the assistive products themselves and the systems and services that accompany them (WHO, 2024). The following basic possibilities for (CWSN) are touch, perceiving, listening, reading, writing, speaking, communication, understanding, remembering, and self-care, which can be tailored with the integration of assistive technology. It is the supplementing mode of perception, practice, personality, inclusion, and participation and creates a path of autonomy. Digital solutions, or information and communication technology-based resources, are one of the most convenient resources for CWSN. Assistive technology for CWSN in terms of ICT based resources can be categorized as mobility, communication and for performing in daily activities. Such as Hardware (mobile, computer, laptop, reading notebook, voice-recorder and speaker)



and software (Tactplus, touch vision, clicker, co-writer seeing AI, mathtalk, Dragon, google classroom, Kurzeil 3000, and speechify). Additionally, various computer-assisted devices support children with special needs (CWSN), including headsticks, light pointers, modified or alternative keyboards, and pressure-activated switches. Other helpful tools include touch displays, specialized software, and voice-to-text applications, with speech recognition software also playing a crucial role in this category (the National Trust, GOI, 2024).

For an Example:

Seeing-AI is a free, artificial intelligence-powered app developed by Microsoft to address real-life challenges faced by the visually impaired. Currently, it is one of the most widely used tools in the teaching and learning process for those with visual impairments. This app, available on iOS (with Microsoft working on an Android version), was launched in 2018 to enhance accessibility for users in need. It includes features that guide users through its functionalities with ease. The Seeing-AI app offers a range of useful features such as text reading, short text recognition, document scanning, product identification, labeling tools, color and currency recognition, handwriting interpretation, scene analysis, light detection, and the ability to recognize people and obstacles (Kumar, 2019, p.44).

Figure 2: Services of seeing-AI App
(screenshot,https://play.google.com/store/apps/details?id=com.microsoft.seeingai&hl=en&gl=US)

The stated assistive technology based devices and resources are one of the parts for amplifying the learning capabilities of CWSN. There are following various dimensions in which the ICT oriented assistive technology supports and improves the capacity and learning environment for CWSN:

Assistive Technology as Academic and Learning Aids

There are different kinds of CWSN learning environments, such as academic, social, and self-learning environments. In all, there are common requirements, i.e., resource availability, functionality and applicability, economic and effective communication, outcome-based training, and hands-on activities. However, assistive technology, in terms of ICT-based resources and services, which may be academic or learning aids, reinforces, balances, and uplifts through all kinds of solutions. These assistive

technology-based solutions may be related to a specific topic, subject, or personal level, including identifying and touching the objects, reading and writing the content in one or more languages, writing through sound or touch and sound, speaking, touching and speaking, identifying the alphabets, words, numbers, special characters, signs, images, colours, and text with audio, storing and transferring specific files on the available and desired devices such as notebooks, Android mobile devices, and computers etc.

Accessibility Features of Operating Systems: Enhancing Inclusivity

In the realm of Information, communication technology, the concept of accessibility has become increasingly significant. As our reliance on digital platforms and devices continues to grow, it is imperative that operating systems (OS) prioritize inclusivity by incorporating features that cater to users with diverse needs and abilities. Accessibility features in operating systems serve to ensure that individuals with disabilities can utilize technology effectively, empowering them to access the digital world on an equal footing with others. This essay explores the various accessibility features commonly found in modern operating systems and their profound impact on fostering inclusivity and usability. Furthermore, operating systems incorporate options for adjusting mouse sensitivity, dwell time, and pointer customization to accommodate users with limited dexterity or hand-eye coordination. These settings enable individuals to fine-tune the responsiveness of input devices, making it easier to navigate menus, click on icons, and perform other essential tasks.

Assistive Technology as Computer Access and Use:

CWSN comes from different socio-economic and educational backgrounds. Therefore, a motivational approach to accessing and using assistive technology based resources such as computers and other ICT-based resources should be part of the curriculum, as decided by the National Educational Policies, Government. of India. Computer access and use, like seed germination, are disconnected from any kind of nurturing element. Certain technologies provide alternative methods of input beyond the traditional keyboard and mouse. These adaptations, which include both software and hardware, offer touch, visual, and auditory feedback to stimulate the creativity and imagination of children with special needs. Today, a wide range of innovative devices is available, such as adaptive pointing tools, customized keyboards, and various other alternative solutions designed to enhance accessibility and usability.

Assistive Technology as Android Mobile Devices

In today's digital world, smartphones are essential for communication, productivity, and entertainment. However, for individuals with disabilities, navigating and using these mobile devices can pose significant challenges. Recognizing the importance of inclusivity, Android mobile devices have implemented a wide array of accessibility features aimed at ensuring that users of all abilities can fully participate in the mobile experience. This essay explores the accessibility features integrated into Android devices and their profound impact on fostering inclusivity and usability. For individuals with hearing impairments, Android devices offer various auditory accessibility features to

ensure effective communication and interaction. Users can enable visual notifications, such as LED flashes or screen vibrations, to alert them to incoming calls, messages, or notifications. Furthermore, Android devices support closed captioning and subtitles for multimedia content, allowing users to follow along with videos and audio with ease. Motor impairments can pose significant challenges for interacting with mobile devices. Android devices address these challenges through various motor and dexterity accessibility features. For instance, users can enable switch access to navigate their device using external switches or buttons, providing an alternative input method for individuals with limited dexterity.

Moreover, Android devices offer options for customizing touch sensitivity and gesture controls to accommodate users with motor impairments. Users can adjust settings such as touch duration and gesture recognition to ensure that their device responds accurately to their input, reducing frustration and improving usability.

Assistive Technology for Visual Impairment Learners:

Seeing the world visually is the need and dream of each and every visual impairment CWSN. Visual impairments present unique challenges for navigating operating systems and applications. To address these challenges, modern operating systems offer a plethora of features aimed at enhancing visual accessibility. High contrast modes, for instance, alter the colour scheme to enhance visibility for users with low vision or colour blindness. Another critical aspect of visual accessibility is screen reader functionality. Screen readers convert on-screen text and interface elements into synthesized speech or Braille output, enabling blind or visually impaired users to interact with the operating system and applications effectively. These tools provide auditory feedback, conveying information about the content and layout of the screen, thereby empowering users to navigate menus, read documents, and even engage in web browsing independently.

Additionally, screen magnification tools allow users to zoom in on specific areas of the screen, facilitating easier reading and navigation. Operating systems also incorporate options for adjusting text size and font styles, accommodating individuals with varying degrees of visual impairment. Technological devices designed for visual communication serve as alternatives for students with varying degrees of visual impairments. Assistive technologies, including ICT-based resources such as talking dictionaries, adapted tape players and recorders, large print and talking calculators, braille writers, closed-circuit televisions (CCTV), and software for screen reading and text enlargement, help enhance accessibility and support learning.

Android devices offer a host of visual accessibility features to assist users with low vision or color blindness. One such feature is the "Accessibility" menu, which provides options for adjusting text size, font styles, and display contrast. Users can customize their device's appearance to enhance readability and visibility based on their individual preferences and needs.

Additionally, Android devices offer a screen magnification tool that lets users zoom in on specific areas with simple gestures, making it easier to read text and see details. The

"TalkBack" feature further enhances accessibility by allowing users to navigate their device through spoken feedback and touch gestures, providing auditory cues for on-screen elements and actions.

Assistive Technology for Oral Communication:

There are no possibilities that an individual CWSN is able to communicate in terms of one to one, or one to many by own self. Sometimes, language does not match at regional or personal level with the other person or CWSN. Therefore, Assistive Technology gives the alternative resources for the CWSN for Oral Communication. Moreover, closed captioning and visual transcripts enhance accessibility for multimedia content, including videos and audio files. Operating systems support the display of captions and subtitles, allowing users to follow along with dialogue or narration. Transcripts provide a textual representation of spoken content, offering an alternative means of accessing information for users who may struggle to perceive audio content.

Assistive Technology for Hearing Impairments

For users with hearing impairments, auditory accessibility features play a vital role in ensuring an inclusive computing experience. Operating systems offer customizable options for visual alerts and notifications, supplementing or replacing auditory cues with visual indicators such as flashing lights or on-screen prompts. This feature ensures that individuals who are deaf or hard of hearing can stay informed about system events, incoming messages, or alarms without relying solely on sound. Additionally, the "Live Transcribe" feature provides real-time transcription of spoken words into text, enabling users with hearing impairments to participate in conversations and understand verbal communication more effectively. This feature utilizes advanced speech recognition technology to transcribe speech from the device's microphone, making it accessible to users in real-time. For users with hearing impairments, auditory accessibility features are essential for ensuring equal access to web content. Websites offer options for closed captioning and transcripts for multimedia content, enabling users to access audio information through visual means. Captions provide textual representations of spoken dialogue or narration, while transcripts offer a written record of audio content, allowing users to follow along with videos and audio files effectively. Additionally, websites incorporate visual indicators and notifications to supplement or replace auditory cues, ensuring that users with hearing impairments can stay informed about important alerts, messages, or notifications. These visual cues may include flashing lights, on-screen prompts, or vibrating alerts, providing alternative means of communication that are accessible to all users.

Motor and Dexterity Accessibility Features of the Assistive Technology:

Motor impairments can significantly impact a user's ability to interact with input devices such as keyboards, mice, or touchscreens. To address these challenges, operating systems integrate various features designed to enhance motor and dexterity accessibility. Customizable keyboard shortcuts and alternative input methods, such as voice recognition or gesture controls, provide users with alternative means of

interacting with their devices, reducing reliance on traditional input mechanisms. Motor impairments can pose challenges for users when navigating websites and interacting with web content. To address these challenges, websites implement motor and dexterity accessibility features such as customizable keyboard shortcuts and alternative input methods. Users can navigate websites using keyboard shortcuts or voice commands, reducing reliance on traditional mouse input and accommodating individuals with limited dexterity or mobility. Furthermore, websites optimize their layout and design to ensure that clickable elements are sufficiently large and spaced apart, making them easier to select for users with motor impairments. These features enhance usability and ensure that individuals with diverse motor abilities can interact with web content effectively.

Assistive Technology for Cognitive Accessibility:

Cognitive disabilities, such as dyslexia, attention deficit hyperactivity disorder (ADHD), or autism spectrum disorders, can impact an individual's ability to process information and maintain focus. Operating systems incorporate features that address cognitive accessibility challenges, including text-to-speech capabilities for reading aloud text-based content and voice recognition for dictating text input. Moreover, operating systems offer options for simplifying user interfaces, minimizing distractions, and reducing cognitive load. These features may include streamlined menu layouts, the ability to hide or customize interface elements, and built-in tools for organizing and prioritizing tasks. By tailoring the user experience to accommodate diverse cognitive needs, operating systems foster greater accessibility and usability for individuals with cognitive disabilities. Cognitive disabilities, such as dyslexia or attention deficit disorders, can impact an individual's ability to process information and interact with technology. Android devices incorporate cognitive accessibility features designed to support users with diverse cognitive needs. For example, users can enable text-to-speech functionality to have text-based content read aloud, making it more accessible to individuals with reading difficulties or cognitive impairments. Additionally, Android devices offer features for simplifying the user interface, such as gesture-based navigation and voice commands, to reduce cognitive load and enhance usability. Users can interact with their device using intuitive gestures and voice commands, minimizing the cognitive effort required to perform tasks and navigate menus. Websites now provide customizable user interfaces, enabling users to personalize settings such as font size, colour contrast, and background colour to better match their unique preferences and needs. For example, a user with low vision may choose a high-contrast colour scheme and larger text to improve readability. These customization options not only enhance the overall reading experience but also minimize cognitive load, making web content more accessible and easier to understand.

Exploring Web Accessibility Features as Assistive Technology

In the digital era, the internet has become an essential platform for communication, information sharing, and accessing a wide range of services. Nevertheless, many

individuals face challenges in fully accessing these resources due to barriers created by inaccessible websites. Recognizing the importance of inclusivity, web developers and designers have implemented a range of accessibility features to ensure that websites are accessible to users of all abilities. This essay delves into the significance of web accessibility features and how they empower individuals to navigate and engage with online content effectively.

Web accessibility involves designing and developing websites to ensure that all users, including those with disabilities, can equally access and navigate online content and services. This encompasses various aspects, including visual, auditory, motor, and cognitive accessibility. Web accessibility features are designed to remove barriers and provide alternative means of accessing content, thus enabling individuals with disabilities to navigate websites independently.

Moreover, websites implement features like skip navigation links and keyboard shortcuts to facilitate navigation for users who rely on keyboard input or assistive technologies. These features enable users to bypass repetitive content and navigate directly to the main content of the page, enhancing efficiency and usability.

Universal Design of Learning as Assistive Technology for CWSNs

Providing multiple resources at one place is one of the important features for Assistive technology. Universal design of learning is one of the feasible facilities that comes under Assistive Technology to the individual learner in their learning environment. Universal Design for Learning (UDL) is an approach where the curriculum—encompassing goals, methods, materials, and assessments—is thoughtfully crafted to provide flexible and inclusive options that can be tailored to meet the diverse needs of each learner. (UNESCO, 2023). Therefore, Universal Design of Learning gives space to CWSNs to touch, read, write, and listen within the digital format of learning material for various stages of learning. National Council of Educational Research and Training (NCERT) developed the 'Barhka Series for all' in print and digital format to serve learning material for all as given in the image. This book series includes audio, video, colourful images and text in different font sizes etc.

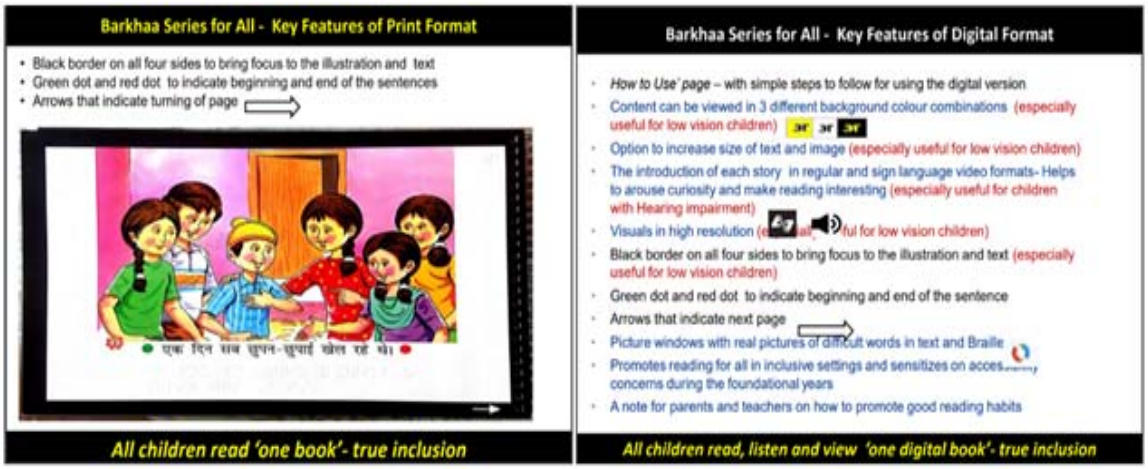
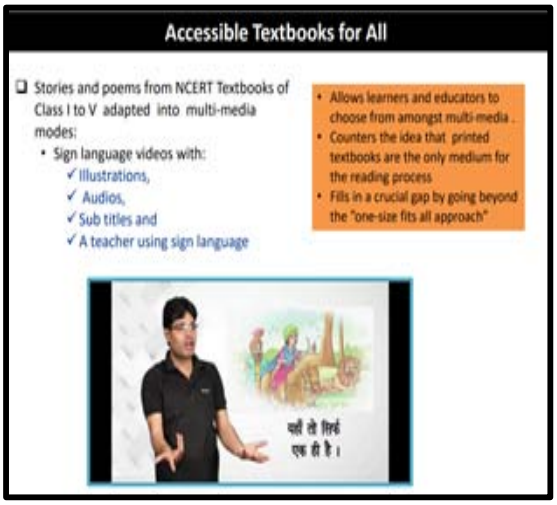


Figure 3 Bharkha Series for all Print and Digital Format, Source: https://www.education.gov.in/shikshakparv/docs/Anupam_Ahuja.pdf

Further, Sign language based multimedia programmes are also developed by NCERT to see and learn educational programmes through Illustrations, Audios, Subtitles and with the help of a teacher using sign language. While, a clear gap in UDL research on the use of technologies to support the Engagement and Action &



Expression principles of UDL, supporting student self-regulation and self-assessment, and on technology-mediated communication and collaboration (Bray et al, 2023). So, more and more research and development activities are required in the area of UDL for CWSNs.

Conclusion:

Assistive technology, specifically ICT-based resources, meets the diverse needs of the CWSN. Interactive multimedia programmes, virtual reality, augmented reality, web services, artificial intelligence-based services, android devices, computers, laptops, audio recorders, and translators for the CWSN must be ingredients as basic assets for learning and performance in their desired environment. Assistive Technology, as beneficial to the CWSN, should ensure that the assessment of learners progresses with the availability, functionality, and accessibility that come under routine practice. First of all, to provide facilities to CWSN, it is necessary to know how many children come to CWSN and their special needs with assistive technology in the school environment or their suitable environment. India is home to 8 million children with disabilities, of whom 45% struggle to achieve literacy. The absence of accessible physical infrastructure, assistive technologies, and ICT tools further exacerbates the high dropout rates among disabled students (UNESCO, 2022). In response, the Department of School Education and Literacy (DoSEL) in India is working to implement home-based schooling for children with severe disabilities as part of its broader efforts to promote inclusivity and ensure education for all (Wadhwan, 2023). The above steps are a good initiative for the CWSNs by the Education Department. Including this, there are three major conditions in which we need to integrate assistive technology in terms of ICT-based resources, such as (a) CWSNs not listed or enrolled, (b) CWSNs enrolled and not considered under an inclusive learning environment, and (c) CWSNs who are aware of and have not applied the ICT-based resources. These services and resources, under a special government drive for each and every CWSN, should be a priority for all kinds of institutions to reduce financial burdens and social disparities.

References:

Aditya Wadhwan (2023). India Introduces home-based learning for schooling for children with special needs. Times of India (https://timesofindia.indiatimes.com/education/news/india-introduces-home-based-schooling-for-children-with-special-needs/articleshow/104999243.cms)

Bray et al., (20203). What next for Universal Design for Learning? A systematic literature review of technology in UDL implementations at second level. British Journal of Educational Technology, 55, pp.113-138

Dheeraj Kumar (2019). NEW GENERATION OF SCIENCE FOR VISUALLY IMPAIRED: ARTIFICIALINTELLIGENCE. International Education & Research Journal. 5(11), pp. 43.45

http://risingkashmir.com/children-with-special-needs-cwsns-statistical-data#:~:text=attending%20educational%20institution.-,According%20to%20UNESCO%2C%20India%20is%20home%20to%208%20million%20children,%25%20do%20not%20attend%20school).

MOE (2020). National Education Policy. Reterived from https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf

Press Information Beauro, Govt. of India (2022). Education of Divyang Children. Ministry of Education

UNESCO, (2023). Guidelines on the inclusion of learners with disabilities in open and distance learning.

World Health Organization (2014). Assistive Technology. Retrieved from: https:/ www. who.int /news-room/fact-sheets/detail/assistive-technology# :~:text= Assistive% 20 products%20can%20range%20from,time%20management%20software%20and%20 captioning

https://builtin.com/edtech/assistive-technology-in-the-classroom
https://thenationaltrust.gov.in/content/innerpage/aids-and-assistive-devices.php

https://builtin.com/edtech/assistive-technology-in-the-classroom

https://thenationaltrust.gov.in/content/innerpage/aids-and-assistive-devices.php

https://www.unesco.org/en/communication-information/odl-guidelines/guidelines#:~:text=Universal%20Design%20of%20Learning%20(UDL,and%20adjusted%20for%20individual%20needs.

Educating Students with Specific Learning Disabilities in Inclusive Classrooms: ICT and Pedagogical Approaches

Sarfaraz Equbal[1] & Shravan Kumar[2]

Abstract

The paradigm shift of education from integration to the mainstream has given inclusivity pedagogical approaches that will not only help students with specific learning disabilities to learn at their own pace but also learn with their preferred style. Education plays a significant role in the overall development of differently-abled students in the context of cognition, social, emotional, and physical aspects. This article provides an introduction to various strategies that could be adopted for educating students with specific learning disabilities in Inclusive classrooms. These strategies are namely: - IEP development plan, Integration of Information and Communication Technology, Universal Design for Learning, differentiated instruction, peer-mediated instruction, co-teaching, and cooperative learning. The focus of this paper is to provide an outline of teaching strategies to teachers of inclusive schools which are expected to improve academic achievement, increase engagement and active participation, enhance self-efficiency with confidence, effectively use ICTs, improve social skills with peer relationships, and successful transition to post-school settings for community inclusion and continuous improvement among students with specific learning disabilities in inclusive setup.

Keywords: Inclusive Classrooms, ICT, Pedagogical Approaches, Students With Specific Learning Disabilities

Introduction

Education is the fundamental right of every individual including students belonging to diversified backgrounds in India. 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. According to the National Education Policy (NEP, 2020) "Education is the single

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biggest instrument for promoting social justice and equality." 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. Special educators learn the various strategies to cater to the needs of diversified groups of learners including students with specific learning disabilities. 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 learn alongside one another and in which the teaching and learning process is appropriately modified to accommodate the needs of various types with disabilities. All children are included in this educational system, regardless of their mother tongue, social, emotional, mental, physical, or other limitations.

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

Specific learning disability (SLD) 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.

"Specific learning disabilities" (SLD) are a diverse range of conditions characterized by a loss in processing spoken or written language, which may appear as difficulty comprehending, speaking, reading, writing, spelling, or performing mathematical calculations. Perceptual impairments, dyslexia, dysgraphia, dyscalculia, dyspraxia, and developmental aphasia are examples of such conditions. (RPwD Act, 2016)

Chapter 3 of RPwD Act, 2016 discusses the need for educational institutions to offer inclusive education 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 amount 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.

In the modern era, we have a diverse range of learners. If the instructor uses a single teaching strategy, then students having different needs may not benefit in an inclusive classroom. Students with specific learning disabilities (SLD) are generally behind their age compared to other children in acquiring new skills required for daily activities and academic learning. As we know, technology is a learning tool, and a thorough understanding of pedagogy is essential to take full advantage of technology.

The purpose of this article is to outline the teaching strategies which focus on "Educating students with Specific learning disabilities in inclusive classrooms".

Some important Pedagogical Approaches for Educating Students with Specific Learning Disabilities (SLD) in inclusive classrooms:

Inclusive strategies for educating students with specific learning disabilities are essential for ensuring that all students have access to a quality education that meets their individual needs. These strategies involve creating a learning environment that accommodates various learning styles and needs, thereby promoting equal learning opportunities for students with specific learning disabilities (SLD) alongside their peers without disabilities. Here are some important pedagogical approaches that can be effective for these students**.** They are as follows:

1. **Individualized Education Programs (IEP)**: Developing an IEP for students with specific learning disabilities is crucial. It provides a personalized plan that addresses the specific needs of the student, outlining accommodations, modifications, and specific goals.
2. **Integration of Information and Communication Technology (ICT)**: Implementing technology designed to assist students with specific learning disabilities can greatly enhance their learning experience. This includes hardware and software devices that support reading, writing, note-taking, and organization.
3. **Universal Design for Learning (UDL):** UDL is a framework for designing educational environments that enable all learners to achieve their full potential. It is a strategy that brings flexibility into the teaching process instruction so that maximum students can use the information. UDL can be defined as "The design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design." (Thompson, Johnstone, & Thurlow, 2002, p.1)

This teaching approach emphasizes three important principles for effective inclusion:

- Provide multiple means of engagement like using audio clips, and videos.
- Provide multiple methods to interact with the information and develop new skills.
- Provide multiple ways for students to communicate understanding on the given topic to cater to the diverse needs of learners.

4. Differentiated Instruction:

It is a strategy for designing and planning instructions and learning experiences based on the abilities and learning styles of diverse learners, to reach all. For this, an instructor should know them well interests, readiness similarities, and differences among them. Tailor teaching methods and materials to meet the diverse needs of learners in the classroom. This could involve presenting information in multiple formats, such as

visually, orally, and through hands-on activities, to ensure that all students can access the material in a way that best suits their learning style. UDL supports differentiated instruction. Differentiation entails getting to know your learner thoroughly, doing whatever it takes to maximize learning, and employing a whole-class method of instruction. The goal of differentiation of instruction is to ensure that each learner's square measures are challenged with work that is difficult but not too difficult and to assist each learner in becoming an independent learner.

Differentiation can be done in four ways: content(***what***), process (***how***), product (***what is created***), and learning environments.

5. Peer-Mediated Instruction:

Peer-mediated instruction refers to a collection of alternative instructional practices in which students serve as instructors for their classmates. This is an instructional strategy that utilizes peers' knowledge to facilitate learning. Peer-provided Instruction can be delivered directly or indirectly, with a focus on academic or social-emotional development among students (Kalfus, 1984). Students interact with classmates to reinforce concepts and collaborate on academic projects. This strategy fosters a supportive learning atmosphere and encourages teamwork, it effectively promotes social interaction, confidence, and reinforces learning objectives. Peer-mediated instruction helps to promote a dynamic and inclusive learning environment that benefits all learners.

6. Co-Teaching:

This type of teaching strategy involves multiple teachers collaborating to teach a group of students with diverse learning needs. Co-teaching creates a personalized learning environment that supports all students. This approach encourages collaboration, accommodates different learning styles, and increases academic success for all students. For example, Vaughn, Schumm, and Arguelles, 1997 identified five evidence-based co-teaching approaches. They are as follows:

a. One Teach, One Assist(access),
b. Station Teaching,
c. Parallel Teaching,
d. Alternative Teaching, and
e. Team-Teaching.

a) **One Teach, One Assist:** "One Teach, One Assist" is a co-teaching technique in which one instructor conducts the class while the other assists pupils or regulates behaviour. Using this technique has the advantage of benefiting not only students with specific learning disabilities (SLD) but also all other students who require extra support by offering extra teaching in a general education setting.

b) **Station Teaching:** This is another technique of co-teaching, "Station Teaching" involves dividing the class into stations and giving students varying education and

support as they rotate between them. This model divides students into three main categories, during a block period, each team works with one of two teachers while simultaneously having independent work time. This concept benefits all students since it allows them to receive small-group training.

c) **Parallel Teaching**: Under this model, instructors must collaborate to develop classes before dividing students into two groups. These two little groups are then taught the same lesson by the teachers. Under this paradigm, teachers gain from one other's knowledge in addition to the advantages that come with working in small groups.

d) **Alternative Teaching:** This is part of a co-teaching strategy in which one teacher instructs while the other pre-teaches and re-teaches ideas to students who require further assistance.

e) **Team-Teaching**: Teachers use this strategy to teach in the same classroom as one another. Instructors can alternately lead lessons or serve as role models for students while the other teacher teaches.

7. Cooperative Learning:

This strategy focuses on providing both academic and social experiences through classroom activities. It is a structured and organized way of using group activities to enhance student learning and structuring positive independence. Students with SLD work in groups to finish assignments on time. Implementing group work and cooperative learning activities can foster an inclusive environment by encouraging peer support and interaction. This helps students with learning disabilities to engage with their peers and promotes social skills. Cooperate learning motivates students to learn from each other. It not only promotes learning through positive interaction and active participation of the students but also develops critical thinking among SLD students.

Conclusion

Diversity among learners has become a known fact. We know that one curriculum does not fit all learners similarly, and one teaching strategy does not meet every student's needs. Every individual has preferred learning styles. The first and foremost thing for teachers is to identify their learners. And all teachers; both general and special educators alike must embrace and promote inclusivity and education for all. This approach not only benefits students with SLD but also enriches the learning experience for all students by fostering a culture of diversity, equity, and inclusion. Integration of ICT with evidence-based pedagogical approaches can create a dynamic, inclusive, and supportive learning environment for students with SLD. This holistic approach not only addresses the specific challenges faced by students with SLD but also enhances the overall educational experience for all students in the classroom.

Recommendations and Implementations:

- **Professional Development**: Teachers should receive ongoing training in using ICT tools and effective pedagogical strategies for inclusive education.
- **Collaboration:** Working closely with special education teachers, ICT specialists, and parents can enhance the support provided to students with SLD.
- **Accessibility**: Ensure that all ICT tools and resources are accessible to students with various disabilities, including visual, auditory, and motor impairments.
- **Professional Development for Teachers**: Providing teachers with ongoing training and resources on inclusive education and students with specific learning disabilities is vital. This ensures that educators are equipped with the knowledge and skills to effectively support students with learning disabilities.
- **Creating an Inclusive Classroom Culture**: Promoting an inclusive and accepting classroom culture is essential. This involves fostering an environment where differences are celebrated, and all students feel valued and included.
- **Collaboration with Parents and Specialists**: Working closely with parents and specialists, such as special education teachers, psychologists, and therapists, can provide a comprehensive support system for students with learning disabilities.
- **Flexible Assessment Strategies**: Using varied and flexible assessment methods to evaluate students' understanding and skills can provide a more accurate reflection of their abilities and potential.

Researchers, educators, and the entire school community must work together to implement these inclusive policies to ensure students with specific learning disabilities receive the academic, social, and emotional assistance they need to succeed.

References

Ford, J. (2013). Educating students with learning disabilities in inclusive classrooms. *Electronic Journal for Inclusive Education*, *3*(1), 2.

Gartin, B. C., Murdick, N. L., Imbeau, M., & Perner, D. E. (2002). How To Use Differentiated Instruction with Students with Developmental Disabilities in the General Education Classroom. DDD Prism Series.

Gerlach, J. M. (1994). Is This Collaboration? *New directions for teaching and learning*, *59*, 5-14.

https://lddashboard.legislative.gov.in/actsofparliamentfromtheyear/rights-persons-disabilities-act-2016.

https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf

Kalfus, G. R. (1984). Peer-mediated instruction: A critical review. *Child Development and Family Behavior Therapy, 6*, 17-43.

Rose, D. H., & Meyer, A. (2006). *A practical reader in universal design for learning*. Harvard Education Press. 8 Story Street First Floor, Cambridge, MA 02138.

Scruggs, T. E., Mastropieri, M. A., & McDuffie, K. A. (2007). Co-teaching in inclusive classrooms: A metasynthesis of qualitative research. *Exceptional Children, 73,* 392-416.

Singal, N. (2010). Education of children with disabilities in India. *Education for All global monitoring report*.

Thompson, S. J., Johnstone, C. J., & Thurlow, M. L. (2002). Universal Design Applied to Large Scale Assessments. Synthesis Report.

Tomlinson, C. A. (2001). *How to differentiate instruction in mixed-ability classrooms*. Ascd.

Vaughn, S., Schumm, J. S., & Arguelles, M. E. (1997). The ABCDE's of co-teaching. *Teaching Exceptional Children, 24,* 67-74.

Educational Interventions for Educating Children with SLD in an Inclusive classroom: ICT and Pedagogical approaches

Deepinder Sekhon[1]

Abstract

Specific Learning Disability is considered by DSM-5 as a type of a Neuro-developmental Disorder that impedes the ability to learn or use specific academic skills like reading, writing, or arithmetic. It is a hidden disability, where a child appears normal but has discrepancy in the classroom performance. The discrepancy is visible in more than one area, such as incomplete classwork, poor spellings, or incoherence in answers. There could be multiple underlying reasons for this difficulty, eventually leading to academic failure and a low self-esteem. The educational interventions therefore need to be manifold and timely. This article gives an account of various interventions that can be adopted in an inclusive classroom. These interventions are based on the case study of the primary classes of a private school, based in Ghaziabad. The study focuses around 60 students, ranging from class 1 to 6, diagnosed with SLD. These children, having availed of educational interventions, for example, making graphic organisers, among others, showed considerable and consistent improvement in academics, leading to have a ripple effect on their overall wellbeing.

Keywords: Specific Learning Disability, classroom performance, educational interventions, well-being.

1.1 Introduction

Any underachievement in reading, written expression, or mathematics, in comparison to the overall intellectual ability of a child, is termed as a learning disorder (Kaplan and Saddock, 2008, p. 585). Specific learning disability (SLD), could encompass difficulty in one or more than one of the following areas; reading (Dyslexia), math (Dyscalculia), handwriting and written expression (Dysgraphia), difficulty in processing sounds (Auditory processing disorder), difficulty interpreting nonverbal cues such as facial expressions, body language, tone of voice, and other nonverbal signals (Nonverbal

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learning Disorder), having poor hand-eye coordination, often losing the places when reading, and have difficulty with pencils, crayons, glue, scissors, and other fine motor activities (Visual perceptual/visual motor deficit) and having specific challenges in processing spoken language (Auditory Processing Disorder), in return impacting the written and expressive language (Gupta.S 2022,Walden University 2024). Based on the type of difficulty that a child with SLD has, the impact is seen in the overall classroom performance, both in academics, as well as behaviour. These prevailing difficulties often lead to a poor self-esteem, lack of friends, as well as truancy from school (Sekhon. D 2021). Noting, the varied manifestations of SLD, the interventions then must be multi-fold. While the interventions must be multi-fold, yet they must also be specific to the needs of each child. While the interventions should be tailor made yet they need to be homogeneous (Anderson. S. et.al 2004). This paper focuses on the educational interventions, designed for students diagnosed with SLD in an inclusive school, along with homogeneity to ensure the spirit of inclusion.

1.2 Specific Learning Disability: Commonly Seen Difficulties in a Classroom

The ability to master the skill of reading and writing is a most cognitively complex one, notwithstanding the fact that many skills are required just to develop the ability to read. (Passer and Smith 2013, p. 305). Similarly, writing is also best understood as a complex intellectual activity that requires students to stretch their minds, sharpen their analytical capabilities and make valid and accurate distinctions (Passer and Smith 2003, p. 13). Thus, it is seen that both reading and writing, are a task that is complex in nature and it becomes even more challenging for a child with SLD. In longitudinal study of 137 students in a school district in California showed results that 50% of the children who had been diagnosed with Reading Difficulty (RD) and Writing Difficulty (RD) in grade 1, continued to have RD and WD in grade 4 as well (Costa.et.al 2016), thus indicating a neurological base that is persistent through the life span. It also indicates that co-occurrence of RD+WD is quite high. Since co-occurrence is seen between different forms of SLD, it becomes binding to understand various forms of SLD.

1.2 a) Dyslexia- Dyslexia is characterized by problems with accurate or fluent word recognition, poor decoding, and poor spelling abilities, which persists lifelong (Munzer.T et.al.2020, Hettiarachchi.D 2021). But the very premise of word recognition, spellings etc requires awareness of phonemes, having orthographic knowledge, and knowledge of semantics. In alphabetic writing, *phonological processing deficit* seems to be the core cause of dyslexia. It assumes that individuals with developmental dyslexia experience difficulties with the representation, storage and/or retrieval of speech sounds (Gu.C and Bi.H, 2020).

1.2 b) Dysgraphia has the connotation, that despite an exposure to adequate instructions, there may be difficulty in letter formation/legibility, spacing in letters, rate of writing speed, grammar, and composition. As per review of literature, completed by Chung.P et al, 2022, there are two bodies of research centred around difficulty in handwriting. While one body ascertains that difficulty in handwriting, is due to difficulty in muscle coordination, the other establishes that difficulty may be arising due to

hindrances in visual perceptual, spatial perception and proprioceptive difficulties. In yet another study, another component of dysgraphia includes the struggle of young writers with shaping the text to articulate their thoughts (Debra Myhill and Susan Jones pg. 142). Dysgraphia thus entails either difficulty in the process of handwriting or it could co-occur with difficulty in the written expression, where the texts are short and poorly organised (Garcia & Fidalgo, 2008; Hooper, Swartz, Wakely, de Kruif, & Montgomery, 2002; MacArthur & Graham, 1987) with the likelihood to containing a substantial number of errors in spelling, punctuation, and grammar (Graham, 1990).

1.2 c) Auditory Perceptual Difficulty – before a child acquires the ability to read, speech perception is regarded as a prerequisite for phonological processing, and individuals with dyslexia experience difficulties in speech perception. As there are different languages, different orthographs, phonology and morphology- different ages for schooling and beginning to read. So different languages also prove a different challenge (Myhill.D et.al. 2002). Tallal (1975, 1980) proposed the rapid auditory processing deficit theory, postulating that individuals with dyslexia are unable to easily process brief cues and rapidly presented information. But when given the same information in a slow manner, the performance of the child showed improvement. (Gu.C and Bi.H, 2020)

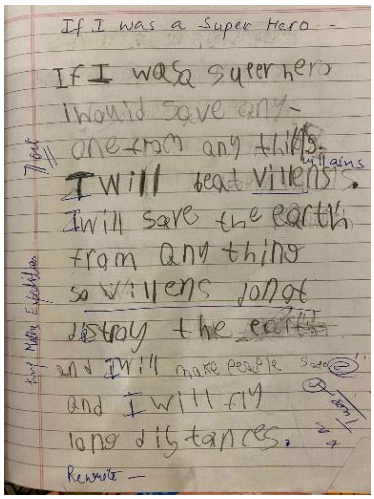
1.2 d) Dyscalculia- Calculation disorder is generally termed as “dyscalculia”, the nuances are however far greater. In dyscalculia, there may be difficulty in reading mathematical symbols, like digits, operational symbols (lexical dyscalculia), difficulty in naming amounts, inability in writing numbers that are dictated (graphical dyscalculia) or understanding mathematical ideas (ideognostic dyscalculia). Reiterating the fact that these problems need appropriate compensatory and remediation programmes (Blackwell.J 1976).

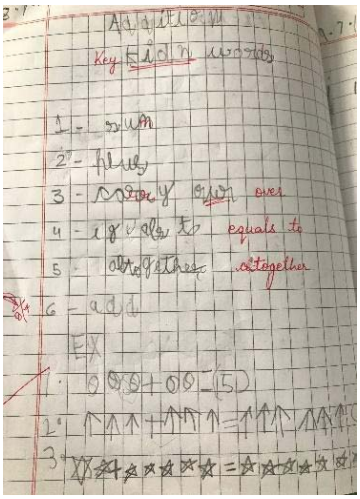
1.3 Conclusion:

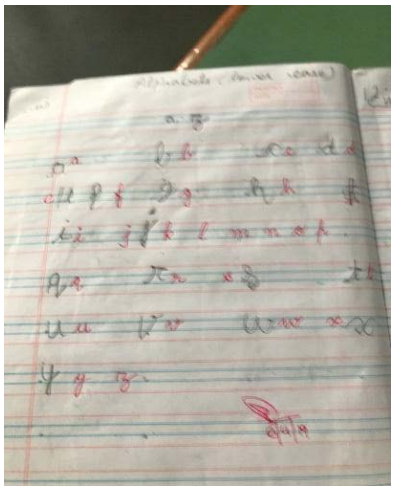
While SLD is a term used to identify a child who is unable to read , write or do mathematical computations, the possibility could be that there could be co-occurrence of more than one type of learning difficulties. The impact thereby is on the overall performance. This can present itself as primary difficulties in acquiring specific academic skills—or as secondary conditions, such as attention-deficit hyperactivity disorder, anxiety disorder or emotional and behaviour problem. In addition, those with SLDs often have poorer long-term social and vocational outcomes. Given the high rate of occurrence of SLDs and their lifelong negative impact on functioning it is important to establish and maintain effective monitoring, prevention, and treatment systems, involving professionals from various disciplines (Grigorenko, E. L. et.al. 2020).

1.4 Red flags: What to watch out for? Samples of Different Classes.

Chart 1







a) Class 2 b) Class 1 c) Class K.G

Red flags should be raised when the performance of a child is not at par with the child's chronological age in more than one area. Once identified, child should be sent for a proper assessment from a clinical psychologist to plan the correct intervention/ remediation.

1.5 Challenges in a classroom

While the inability to read fluently, make mistakes in spellings or calculations, having incomplete work are the most seen difficulties, noteworthy mistakes can also be seen during writing. Difficulty mainly arises in transcribing the knowledge onto paper with limited use of internal sentence punctuation; Frequent omission of full stops or inaccuracy at sentence construction; Limited description through noun phrase expansion; Limited variety in sentence structure or length; Very plot-driven writing, with little establishment of character or setting; A tendency toward writing which is reflected using visual modes; or there is a tendency to use language patterns reflecting oral rather than written genres. (Ronneberg.e.t.al). Because of multiple difficulties, not only is the academic performance effected but so is the self-esteem. Keeping all the above challenges in mind, diverse remediation is recommended.

2. Methodology

Case study of sixty students formally diagnosed with SLD was conducted in a privately aided CBSE school, based in Ghaziabad UP. The students ranged from grade 1-6 and were given intervention on an individual and group level. Individual interventions, in the form of special education and occupational therapy were given thrice a week on alternate days for an hour each. The team consisted of three special educators and one occupational therapist, who also imparted classroom training. The aim of this study was

to see the effectiveness of the interventions and remediations over a prolonged period, as SLD is a disorder, prevailing over the life span. The study was thus conducted over a period of nine years The parameters of assessing the efficacy were based on the comparative study of the samples of report cards, handwriting, written expressions, and observation of overall classroom behaviour. The classroom behaviour was ascertained by the subject teachers and the class teachers, based on a checklist provided by the team. Interventions that were planned were research based. Total of 87 documents including, 57 journal articles, dissertations, conference papers, 4 books and policy documents and e-links and were reviewed by the author, who was pursuing her doctorate at the same time. While the interventions were research based, the case studies were conducted to understand the common threads that showed effective results both academically and socially.

3. Educational and Pedagogical Interventions

The interventions were planned on three parameters. A) Creating teacher awareness through recurrent trainings, b) early detection and early interventions and c) accommodations, as per the CBSE guidelines. This paper mainly concentrates on different educational interventions administered to children with SLD.

At the onset, a detailed individual education plan (IEP) was made for each child, highlighting both strengths and weakness. The class teacher, subject teachers and parents were a part at the planning stage of the IEP. The IEP helped in providing accommodations at the level of evaluation, by preparing a slightly different question papers and in reducing the quantum of syllabus, where the gap between the class and the level of the child was more than 3 years. The interventions were eclectic in nature. As one size does not fit all, yet inclusion is the right of every child, a broad framework was adopted to teach the reading writing and mathematical skills in the classroom. Best practices were churned from the research studies and then adopted which have been explained in the subsequent sections.

a) **Classroom arrangement and individual attention –** sitting arrangement in the front seats, speaking in a slow manner, giving one or two instructions at a time, monitoring if the child had understood were a few strategies adopted in all classrooms. (Sekhon.D 2021)

b) **Developing Reading Skills-** The initial stages of reading are characterized into how letters and group of letters map into their corresponding sounds, which is called phonological decoding. This helps children in reading the words which they have heard but never seen before, yet phonological processing deficit seems as the core cause of dyslexia (section 1.2 a). Reading skills were developed using different techniques. Step one was Building awareness about the English orthographic, spelling patterns and how to use them in reading, subsequently followed. Since phonological processing is a known deficit, teaching spellings and developing reading through rhyming words was a strategy that worked. For example, columns of different spelling patterns but similar sounding words were made and recited in a

fun manner. The aim was to discern the difference in the spelling patterns. (Gill.S.R 2019)

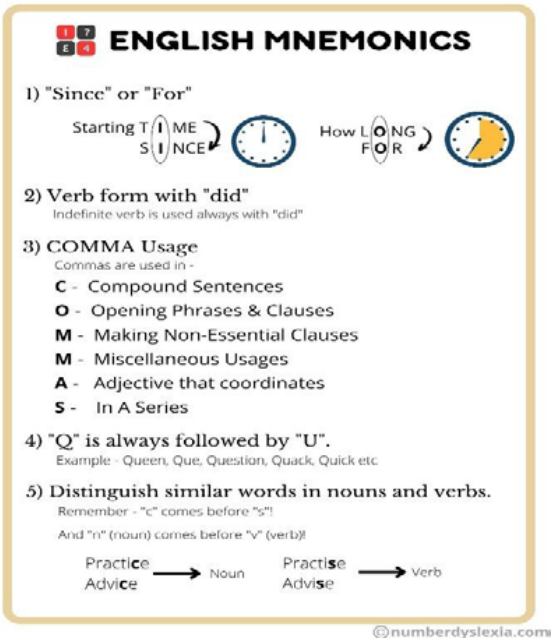
Table 1.1

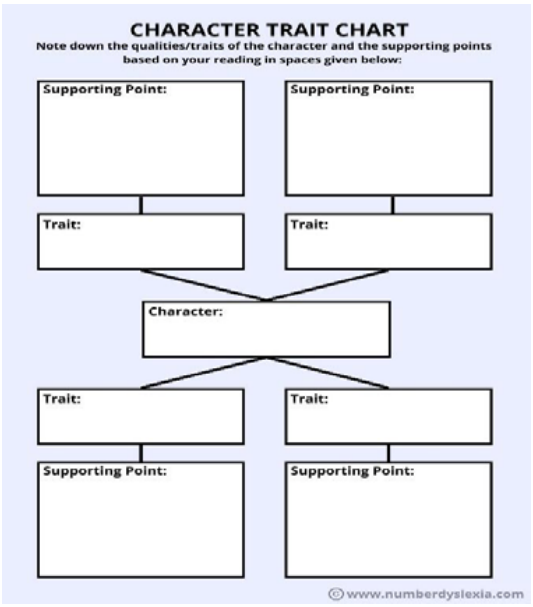
Might	kite
Bright	site
Light	bite
Sight	white

There are however thousands of words in English as a language and memorising so many words proved difficult for some. Also, assistance of a teacher was always required. Another strategy adopted in developing **Phonological Decoding** was that of **Self-Teaching Techniques** (PDST). As per this technique, the rudimentary skills of grapheme-phoneme connection were given to the children in a supervised manner, post that based on this decoding, children acquired the skill of pronouncing unfamiliar words. Once pronunciation is achieved in the phonological lexicon, the orthographic lexicon is directly achieved (Ziegler, J. C 2014).

b) Improving writing skills - Developing mnemonics; Making graphic organisers for clarity and better organisational skills; Note making while the teacher teaches and peer tutoring in elaborating the content with the assistance from the teacher or the peers were a few strategies that were helpful (Anderson. S. et.al Middle 2004)

Chart 2





a) **Intervention for Mathematics-** Math is taught using direct instructions and rote problem-solving techniques; little emphasis is made to understand if the child has understood a concept or not. A three-tier system, adopted seemed to be helping children master problem solving in math. Tier one concentrated on giving explicit and clear instructions to children, tier two gave the freedom to children to solve the problems in which ever manner they thought was correct. They were then paired in the third tier, with the group of children who solved the problems systematically. While the three-tier method is based on peer learning and the child being given the freedom to first tackle a problem on his own, difficulty arises in solving problem sums (refer sec.1.2 d). In an article published by Leh.J and Jitendra. AK (2013), a comparative study was done of students with dyscalculia, who were taught problem sums using computer mediated teaching (CMT) and teacher mediated teaching (TMT). While the software provided graphic representation and pictorial representation of the problem sums, children still preferred using the TMT, as the vocabulary was easily decoded by the teacher and the children were able to ask for help. The problem sums when given on a computer proved lengthy and boring. Another finding that was highlighted was that too many pictorial representations confused children, in comparison to simple drawings.

A similar finding was observed at the school as well, where the case studies were conducted. The most effective strategy that worked, was, giving similar type of sums consistently, with repeated instructions, use of concrete objects and breaking down of the problem to the bare minimum demand.

Not with standing the fact that many strategies are required for individual needs, prevalent interventions recorded were also based on Developing Mnemonics, making graphic organisers for clarity and better organisational skills. Note making while the teacher taught and class wide peer tutoring (Anderson. S. et.al 2004).

Findings and Conclusion

As the interventions were planned on three parameters. The findings suggested that teacher awareness was paramount, preceding the individual interventions. Not only did it help in creating an awareness but also sensitised the teachers towards the emotional needs of the children. Teachers became more attentive towards the individual needs. Altering the sitting arrangements, giving personal attention to the child, further accentuated the self-esteem of children with SLD.

The PDST method of teaching spellings improved the reading abilities which had a domino effect in all subjects.

Further placement of alphabet charts with sight words, and charts with mathematical signs helped in the retention and motor memory.

Teaching math proved more challenging, but peer tutoring along with use of concrete objects assisted the teaching learning process.

Given all the above, Consistency, repetitive practice and having multiple drafts helped children with SLD.

References

Blackwell, J. M. (1976). When 2 + Ain't 4. Language Arts, 53(4), 422–424. http://www.jstor.org /stable/41404183

Butterworth, B., Gallistel, C. R., & Vallortigara, G. (2018). Introduction: The origins of numerical abilities. Philosophical Transactions: Biological Sciences, 373(1740)

Chanyuan Gu, Hong-Yan Bi (2020) Auditory processing deficit in individuals with dyslexia: A meta-analysis of mismatch negativity. *Neuroscience & Biobehavioural Reviews,* volume 116, pg.396-405

Costa, L.-J. C., Edwards, C. N., & Hooper, S. R. (2016). Writing Disabilities and Reading Disabilities in Elementary School Students: Rates of Co-Occurrence and Cognitive Burden. Learning Disability Quarterly, 39(1), 17–30.

Debra Myhill and Susan Jones Lost for Words: Instructional Approaches to Support Older Struggling Writers. Chapter 8

Gill, S. R. (2019). Sounding It Out Is Just the First Step: Supporting Young Readers. YC Young Children, Vol 74 No (1), pp 38–43

Grigorenko, E. L., Compton, D. L., Fuchs, L. S., Wagner, R. K., Willcutt, E. G., & Fletcher, J. M. (2020). Understanding, educating, and supporting children with specific learning disabilities: 50 years of science and practice. *American Psychologist, 75*(1), 37–51.

Hettiarachchi.D 2021 An overview of dyslexia: Sri Lanka Journal of Child Health, Vol 50. No 3, Pg: 529-534

Leh, J. M., & Jitendra, A. K. (2013). Effects of Computer-Mediated Versus Teacher-Mediated Instruction on the Mathematical Word Problem-Solving Performance of Third-Grade Students with Mathematical Difficulties. Learning Disability Quarterly, 36(2), 68–79.

Lewis, K. E. (2016). Difference Not Deficit: Reconceptualizing Mathematical Learning Disabilities (Reprint). The Journal of Education, 196(2), 39–57.

Munzer.T, Hussain.K, Soares.N Feb 09, 2020 Dyslexia: neurobiology, clinical features, evaluation, and management: *Transational Paediatrics* (Suppl 1): S36–S45.

Nizami.I. Disorder of written expression and dysgraphia: Definition, diagnosis and management. Chung. P, Patel.D, Transational Paediatrics, 2020 Feb .9 (supp 1) 46-54

Sekhon. D 2021. Policies and practices for Children with Special Needs in an Inclusive classroom: Study of the Government Schools of the Delhi Region. National Institute of Education Planning and Administration, New Delhi.

Teresa J. Gardner. (2011). Disabilities in Written Expression. Teaching Children Mathematics, 18(1), 46–54.

Ziegler, J. C., Perry, C., & Zorzi, M. (2014). Modelling reading development through phonological decoding and self-teaching: implications for dyslexia. *Philosophical Transactions: Biological Sciences*, *369*(1634), 1–9.

Links visited

https://doi.org/10.1037/amp0000452 accessed on 23.2.24

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7082242/ accessed on 24.2.24