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# Journal of Research in Education

(A Peer Reviewed and Refereed Bi-annual Journal)
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St. Xavier's College of Education
(Autonomous)
P.O.. Digha Ghat, Patna - 800 011 (Bihar)

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# Editorial Note!

**Welcome to the Journal of Research in Education (JRE) presented by SXCE, Patna, Bihar, India.**

Greetings from St. Xavier's College of Education (Autonomous), Patna! We are delighted to present the latest edition of the ***Journal of Research in Education (JRE)***, a platform dedicated to fostering academic excellence, reflective practice, and transformative research in the field of education. Rooted in the Jesuit tradition of intellectual rigor, social justice, and holistic development, JRE invites educators, researchers, and practitioners to engage with thought-provoking ideas and evidence-based insights.

This edition features a rich collection of scholarly articles addressing contemporary educational challenges, innovative pedagogical strategies, inclusive practices, and emerging trends, including AI integration, multilingualism, and socio-emotional learning. We extend a warm welcome to our readers and contributors, and encourage critical dialogue, interdisciplinary inquiry, and a shared commitment to shaping meaningful and equitable learning environments.

**Prof. Lalit Kumar**, in ***"Managing Learning and Intellectual Disabilities – The Agenda for 2047 Bharat"***, presents a compelling vision for an inclusive and equitable India. He emphasizes the urgent need to shift from a charity-based to a rights-based approach in addressing learning and intellectual disabilities. Dr. Kumar outlines a multi-layered strategy that includes early identification, inclusive classroom practices, accessible infrastructure, and community participation. He strongly advocates for teacher training, policy reforms, and the use of assistive technology to empower children with disabilities. Aligning his vision with the goals of *Viksit Bharat@2047*, he calls for inter-sectoral coordination among education, health, and social justice ministries. His agenda reflects a deep commitment to social justice, where persons with disabilities are not marginalized but integrated as equal contributors

to the nation's progress. This paper is a timely reminder that true national development is impossible without inclusivity and dignity for all.

In the ***"Higher Education in the Digital Age: Possibilities and Challenges"***, **Dr. Prakash Louis** critically examines the transformative impact of digital technology on higher education. He highlights the vast possibilities digital tools offer, expanding access, enabling personalized learning, and fostering global academic collaboration. Dr. Louis acknowledges how online platforms and AI-driven solutions can democratize education and reduce infrastructural constraints, especially in remote areas. However, he also raises significant concerns, such as the digital divide, data privacy, declining student-teacher engagement, and overdependence on technology. He cautions against the commodification of education and stresses the need to uphold academic integrity and human values. Dr. Louis advocates for a balanced and inclusive digital strategy that integrates traditional pedagogy with technological innovation. His article urges policymakers, educators, and institutions to ensure that higher education in the digital era remains accessible, equitable, and rooted in critical thinking and ethical responsibility, essential for building a just and enlightened Bharat by 2047.

The article on ***"Strengthening a Self-Reliant Economy through Malaviya's Ideals and NEP 2020"***, by **Dr. M. Shamsath Begam** thoughtfully connects the visionary economic and educational ideals of Pandit Madan Mohan Malaviya with the transformative framework of the National Education Policy (NEP) 2020. She emphasizes how Malaviya's focus on indigenous knowledge, ethical leadership, and vocational training resonates with NEP 2020's thrust on skill development, entrepreneurship, and holistic education. Dr. Begam highlights that building a self-reliant economy (Atmanirbhar Bharat) requires nurturing human capital through values-based, multidisciplinary education rooted in India's cultural and intellectual heritage. She calls for a collaborative approach between academia, industry, and government to empower youth with relevant skills and a sense of national responsibility. The study is a compelling reminder that economic resilience is inseparable from educational reform, and that reviving Malaviya's ideals through NEP 2020 can pave the way for a more equitable, innovative, and self-sustaining India by 2047.

In the article ***"Educational Aspirations of University Girl Students: A Study of Lucknow"***, **Dr. Rajesh Ekka** explores the evolving dreams and challenges of young women pursuing higher education in an

urban Indian context. Drawing from empirical insights, he highlights how socio-economic background, parental support, peer influence, and institutional environment shape the aspirations of girl students. Dr. Rajesh Ekka emphasizes the growing ambition among university girls to pursue careers in academics, civil services, and entrepreneurship, reflecting a shift toward empowerment and independence. However, he also notes persistent barriers such as gender bias, safety concerns, and limited access to resources. The study calls for policy support, mentorship programs, and gender-sensitive campus environments to nurture these aspirations. Dr. Ekka's work offers a timely reflection on the importance of enabling young women to realize their potential, making them active contributors to a progressive and inclusive India envisioned for 2047.

The article on ***"Strengthening Emotional Competencies to Reduce Conflict"***, written by **Dr. Pratheesh P.,** underscores the vital role of emotional intelligence in fostering harmony across personal, educational, and professional settings. He argues that many interpersonal and institutional conflicts stem from poor emotional awareness, lack of empathy, and ineffective communication. By promoting emotional competencies such as self-awareness, emotional regulation, empathy, and social skills, individuals can better manage stress, build healthier relationships, and respond constructively to disagreements. Dr. Pratheesh highlights the importance of integrating emotional learning into school and college curricula, teacher training, and organizational development programs. He advocates the significance of peer mediation as a means for resolving conflicts among students, enhancing empathy and improving interpersonal relationships. This article is a timely reminder that emotional competence is not just a personal trait but a foundational skill for social cohesion, particularly in today's polarized and fast-paced world. Building emotionally resilient individuals can lead to more compassionate and conflict-free communities.

In the article "***Analysis of Multiple Intelligence in Activities of Eighth-Grade Science Textbooks," Dr.* Aribam Pratima Devi** offers a thoughtful critique of how educational materials engage diverse learner strengths. Drawing on Howard Gardner's Multiple Intelligence theory, she examines how science textbook activities address logical-mathematical, naturalistic, linguistic, spatial, musical, bodily-kinaesthetic, interpersonal, and intrapersonal intelligences. Dr. Devi finds that most of the activities were experiential. Logical intelligence, Kinesthetics intelligence and Verbal intelligence were the most represented

intelligence, while Naturalist intelligence, Intrapersonal intelligence and Musical intelligence were found to be less defined. Findings show that not all multiple intelligences were considered when designing the science activities. The paper suggests that individual differences must be considered during the design of the activities.

The article on "***Integrating Technology in Education: Insights from NEP 2020,"*** by **Sandip Das** and **Dr. Sanjay Singh Yadav,** explore how the National Education Policy 2020 envisions the transformative role of technology in reshaping Indian education. They emphasize NEP 2020's call for equitable and inclusive digital learning through platforms like DIKSHA, SWAYAM, and the National Educational Technology Forum (NETF). The authors underline how technology can bridge learning gaps, personalize instruction, and enhance access in underserved regions. However, they also caution against challenges such as the digital divide, infrastructure limitations, and the need for digital literacy among educators and learners. The editorial advocates for teacher training, content localization, and blended learning models to ensure meaningful technology integration. Das and Dr. Yadav argue that technology, when thoughtfully implemented, can democratize education and foster innovation. Their study offers a balanced and forward-looking perspective, aligning NEP 2020's digital vision with India's goal of becoming a knowledge society by 2047.

In their article "***Computational Thinking in Education: A Key to Enhancing Analytical and Problem-Solving Abilities,"*** **Antaryami Hissaria** and **Prof. Jatinder Grover** underscore the importance of embedding computational thinking (CT) in modern curricula, particularly in STEM and its impact on students' cognitive development. They argue that CT, comprising decomposition, pattern recognition, abstraction, and algorithmic design, cultivates essential cognitive skills that transcend coding, enabling students to tackle complex, real-world problems methodically. Hissaria and Grover advocate for integrating CT across subjects, not just computer science, transforming math, science, and humanities lessons into platforms for structured thinking and innovation. They highlight benefits such as improved logical reasoning, creativity, and a growth mindset, while cautioning that successful implementation hinges on teacher training, resource availability, and curriculum redesign. They urges policymakers, educators, and institutions to invest in CT workshops, collaborative projects, and assessment reforms. Framed within India's aspiration as a digitally empowered nation by 2047, the authors make

a compelling case: computational thinking is not merely a skill, but a foundational tool for the thinkers and problem-solvers of tomorrow.

The article on ***"The Impact of Mental Fog on Memory Retention in Digital Learning,"*** by **Kavita Sharma** and **Dr. Manju Gera** investigate how the prevalence of "mental fog" in digital learning environments hampers students' capacity to retain information. They define mental fog as cognitive overload, characterized by distraction, fatigue, and reduced focus, often exacerbated by excessive screen time, multitasking, and frequent digital interruptions. Sharma and Gera highlight how these factors disrupt encoding and consolidation of knowledge, leading to shallow learning and forgetting. They stress the need for instructional design that mitigates cognitive load, such as chunked content, structured breaks, attention-focused tasks, and multimodal engagement, to restore clarity and deepen learning. The authors also call for educators' training to identify mental fog symptoms and implement strategies like mindfulness exercises, digital detox periods, and reflective prompts. This article emphasizes that while digital tools offer flexibility and access, educational effectiveness hinges on combating mental fog. Balancing innovation with cognitive wellness ensures learners gain a lasting understanding in the digital age.

**Dr. Preksha** and **Dr. Kanwalpreet Kaur's** article on "***Neuroeducational Insights into Cognitive Enhancement via Multilingual Practices"*** highlights neurocognitive benefits of multilingualism. They argue that integrating multiple languages early enhances executive functions—such as attention control, task-switching, and inhibitory regulation—due to the brain's constant engagement in managing language systems. Neuroimaging studies show multilingual individuals display greater grey and white matter density in language-related and executive control regions (e.g., inferior parietal cortex, anterior cingulate), reflecting structural neuroplasticity. These changes correlate with improved memory, cognitive flexibility, and problem-solving, the very skills essential for academic success and lifelong learning. The authors advocate embedding multilingual education across subjects, early in schooling, to harness these brain-based advantages and promote metacognitive awareness. They caution that successful implementation requires supportive curricula, trained teachers, and culturally responsive pedagogy. In conclusion, Preksha and Dr. Kaur assert that multilingual practices, grounded in neuroeducational insights, are powerful catalysts for cognitive enhancement in 21st-century learners.

**Tanmoyee Bhattacharjee and Prof. Jyoti Sankar Pradhan's** qualitative thematic analysis article on **"*Thematic Analysis of Parental Involvement and Its Impact on Social Science Learning Among Tribal and Non Tribal Girls in West Bengal*"** reveals nuanced differences and shared barriers in how parents engage with their daughters' education. This study investigates the impact of parental involvement on the academic outcomes of secondary school girls from tribal and non-tribal backgrounds in West Bengal, India. Using thematic analysis, it identifies key differences in parental engagement. Tribal parents face distinct challenges such as limited educational attainment and time constraints due to agricultural responsibilities. In contrast, non-tribal parents demonstrate greater involvement, contributing to higher levels of student motivation and academic performance.

The findings reveal that parental involvement has a significant influence on students' interest and achievement in subjects such as social science, with its effectiveness varying based on parents' educational background and access to resources. The study highlights the critical role of active parental engagement in promoting academic success, especially among tribal students who encounter greater socio-economic and cultural barriers.

**Ms. Preety** and **Prof. Rekha Rani** critically examine how excessive social media use among students disrupts learning strategies, engagement, and academic outcomes. They highlight that **social media addiction**, a form of behavioural dependence marked by compulsive use, distraction and anxiety, lowers self-control and increases stress, impairing students' ability to focus and manage study habits effectively. This study examined the impact of social media addiction on students' learning strategies, engagement, and academic performance. Findings revealed that excessive use of social media impairs cognitive functions, time management, and focus, leading to fragmented study habits and lower academic productivity. It also highlighted a decline in active participation and meaningful academic interactions, ultimately affecting overall academic achievement.

**Dr. Varinder Singh** and **Dr. Shamim Aara Hussain's** studied on **"English Language Competence of Government School Teachers of Punjab"**. This study explores the English language competence of government school teachers in Punjab, emphasizing the evolving role of teachers as facilitators and communicators. Using a descriptive survey method, data from 120 randomly selected teachers revealed that most had low English language proficiency.

The study found a significant influence of educational qualifications on language competence.

We extend our heartfelt appreciation to the dedicated faculty members and the esteemed editorial team of ***St. Xavier's College of Education (Autonomous), Patna***, for their unwavering commitment, intellectual rigor, and collaborative spirit in bringing this edition of the ***Journal of Research in Education (JRE)*** to fruition. Your scholarly contributions, meticulous review processes, and thoughtful curations reflect a deep engagement with the evolving landscape of education.

Each article published stands as a testament to your academic depth, critical inquiry, and passion for advancing knowledge that matters. From ideation to publication, your hard work has shaped JRE into a vibrant platform that nurtures reflective thought, ethical research, and innovative pedagogy.

Thank you for upholding the high standards of academic integrity and for fostering a culture of excellence and inquiry. Your collective efforts continue to inspire the academic community and enrich the world of educational research.

As we present this edition of the ***Journal of Research in Education (JRE)***, we extend our best wishes to all the contributors, reviewers, and readers. We hope this journal continues to catalyse meaningful dialogue, innovative research, and transformative practices in education. Your engagement, feedback, and scholarly interaction are vital to the growth and excellence of JRE. We look forward to your continued support in enhancing the quality and reach of this academic platform. Together, let us strive to make JRE a beacon of educational insight, integrity, and impact for years to come. May God bless us all in our day-to-day endeavours in the field of Education, responding to the signs of the time through our reflections and analysis.

May this issue inspire further reflections, research, and actions as we journey together towards educational transformation for a better tomorrow.

# CONTENT & AUTHOR

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# Managing Learning and Intellectual Disabilities- The Agenda for 2047 Bharat

## Abstract

*India is planning to become the developed nation by 2047, but it is possible only if it manages the disabilities among its population. More particularly it needs to take care of the disabilities among its young population (0-18 years of age; and more particularly 0-6 years of age) because the major basis of this planning is the availability of its comparatively young population. We know among the disabilities affecting the young population Intellectual Disability and Learning Disability are crucial. Intelligence Testing reflects that the 2.2 % individuals are in the lowest category of intelligence and 2.2% are in the highest category. Below 2.2% are the persons suffering from Intellectual Disability (I.D). Its further classification reveals that it ranges from Mild and Moderate to Severe and Profound, and may be more in percentage if scientifically and properly identified. In India it is estimated to around 2-3% in which children below 10 years are in good number. The country also has a good number of Learning-Disabled Children. Number and Percentage are not so categorically and accurately identified, but it is believed to be 5-15% in Indian population. Some studies suggest the pooled prevalence of learning disabled around 8%. We need good number of quality multidisciplinary researches in the area of LD&ID. Both these disabilities together are to be controlled and managed by the nation amply if the country has to be the developed one. The government of India needs to take certain measures in this regard as Early Identification of the Disabilities; Ample Awareness regarding Disabilities among the Common Mass; Proper Schooling of the Disabled Children; Educating Parents about Disabilities; Forming Groups of disabled Parents for Help and Encouragements; and many more.*

***Keywords:*** *Managing learning, Intellectual disabilities, Learning disabilities, Awareness regarding disabilities, Early identification*

## Introduction

India is the young country and the future younger or youngest country of the world as today we have comparatively young population in our favour. Based upon the population benefit and other resources the country has dreamt through its dynamic prime minister Shree Narendra Modi to become a developed nation by 2047. Narrating the view of the Indian Government Thakur, AS (2023) aptly states, "The world's youngest yet largest democracy is 75 years old today. The nation will celebrate 100 years of independence in 2047. The next 25 years are termed Amrit Kaal by Prime Minister Shri Narendra Modi Ji. It is going to be the gateway to the swarnim yug, which is poised to start after 2047. The PM has also resolved to make India a developed nation by then." He further claimed and shared that in 2047, 21% of the global workforce will be in India. Presently it is the fifth largest economy of the globe, and going to be the third economic power soon. We all know if the country has to grow and develop it is only possible through its human resources because among all the possible resources it is the supreme. Whether it is finance, material, time, or any other resources available with a nation; it will be utilized properly only if we have healthy, educated, trained and skilled manpower. Disability among the human population is the greatest challenge and hindrances in the way of our becoming developed nation by 2047, and that has to be addressed with care by the nation in general and the prime minister in particular. NCFFSE (2000) narrates in the same way, "Equality in Education requires personalized pedagogy, and a careful investigation into individual aptitudes. Compensatory and remedial measures in education to suit the needs of the deprived, the disadvantaged and the challenged, with a view to bringing them at par with other students, assume central importance".

Among different form of disabilities Intellectual and Learning Disabilities are to be addressed more promptly as it occurs in early stages of human development. The classification of disability is also an issue to be addressed. The exact number and percentage of category wise disabled to be identified as well. This is the first step in the direction of managing disability in general and Intellectual and Learning disabilities in particular. The Government of India (2023) reports that "The Rights of Persons with Disabilities Act, 2016 (RPwD, Act, 2016) as passed by the parliament in December, 2016, and brought into force from April 19, 2017 identifies five categories of Disabilities (1) Physical, (2) Intellectual, (3) Mental Behaviour (Mental illness), (4) Disability caused due to (i) Chronic Neurological Conditions & (ii) Blood Disorder, and

(5) Multiple Disabilities". Status of Disability in India a Review of Policy, Schemes and Facts on Disability (2020) reflects, "Between 110 million and 190 million people globally are estimated to be suffering from some form of the disability and nearly a fifth of the global total i.e., people, experience significant disabilities. In the Indian context, the NSSO estimates 2.2 percent of the Indian population to be disabled (NSSO 76th round, 2019)". Status of Disability in India a Review of Policy, Schemes and Facts on Disability (2020) again reflects in another chapter, "A report by the world Bank states that while estimates vary, there is growing evidence that persons with disability are around 40-80 million, which constitute between 4-8% of India's population." Scaria LM, Bhaskaran, D and George, B (2023) mentions, "This systematic review reports an 8% prevalence of SLD in India. The High Prevalence of SLD among children in India implies the need for awareness generation among parents and teachers. Adopting community sensitization programs will be beneficial for early identification and improving access to remedial education programmes."

The sad aspect of this issue is that in comparison to developed nation we have very little facilities in the matter. No need to say we are bigger country in population and so clearly, we have a more population of intellectually-disabled and learning-disabled young population as well. This issue we have to address as a challenge to be the developed nation by 2047. To find accurate figure based on disability is a bigger challenge to handle, especially for a big country like India. Some data are there, but that is not enough to tackle the issue specifically. The Government of India (2023) through Annual Report 2023-24(2023) reflects that as per census 2011, there are 2.68 crore persons with disabilities in Inda which constitute 2.21 percent of the total population. Out of total populations of persons with disability, approximately 1.50 crore are male and 1.18 crore are female. These include persons with visual, hearing, speech and loco-motor disabilities, mental illness, mental retardation (intellectual disabilities), multiple disabilities and other disabilities. Status of Disability in India a Review of Policy, Schemes and Facts on Disability (2020) in one of its chapters places the figure in percentage as Visually impaired = 31%; leprosy affected= 17%, Intellectual and development disabilities= 27%, Hearing Impaired= 12% others = 13%. About the children related data in terms of their ages Saurabh, S (2022) places more particular information meaningful in terms of Learning and Intellectual Disabilities both, "A major part of India's population-around 158 million consists of children in the age group of 0-6

years. India is home to 472 million children up to the age of 18 years and comprising 39 percent of the country's population. There are roughly 30 million orphaned and abandoned children in India- that's almost 4% of the youth population."

Learning disability and intellectual disability are two terms about which the people become confused. In confusion they do understand the both as the same, but two particular disabilities are different from one another. In intellectual disability, the individual has a lower IQ than the average IQ, and subsequently intellectually disabled person gets difficulty in performing day to day activities. Learning disability is an umbrella term which is used to refer to a variety of disabilities in learning - Reading, Writing, Solving mathematical problems, etc. Sometime back intellectual disability was named as mental retardation; nowadays it has been replaced by intellectual disability. A person having intellectual disability usually face some problems as communicating effectively, solving problems, making decisions, learning, reasoning, etc. Person having intellectual disability usually has IQ less than 70. If the country has to grow these are to be managed. Rani, Shashi (2016) and many like her expects by the Indian Government for children with disabilities that they will be ensured right to care, protection and security; dignity, equality and enabling environment; inclusion and effective access to education, health, vocational training; and right to development.

Experts can identify person having intellectual disability in a conclusive manner as the person may be identified on the basis of his/her characteristics like frustration, uncontrolled anger, non-remembering problem, non-management of problem. There is the urgent need for the general awareness regarding its early identification and monitoring. Director, NCERT (2022) is also of the similar view, "Rights of Persons with Disabilities (RPwD) Act, 2016 recognizes 21 disability conditions and recommends various provisions for Persons with Disability. It encourages equity-based inclusion in our society and inclusion of children with Special Need (CWSN) in regular schools while taking care of their special needs. It implies that all children with disability should be properly identified and certified at the earliest to address their special needs and support them." Learning disabilities are varied and difficult to identify. Its identification needs expertise as some learning disabilities like identifying colour, letters, pronunciation, rhyming, etc. may be experienced in early years and not in later years of age. Dyslexia (reading difficulty), Dysgraphia (writing difficulty), Dyscalculia (mathematical difficulty), Auditory Processing Disorder (hearing

difficulty), Visual Processing Disorder (chart, map, picture, etc. understanding difficulty), etc. are some common learning disabilities. Learning disability is a problem related to the processing of the brain during sending, receiving, and processing of information.

Early identification and management of these two disabilities are necessary to utilize our human resources, and if India has to be a developed nation by 2047 this aspect of managing our learning and intellectual disabled population has to be addressed scientifically and honestly with plans, policies and actions. Kacker, S (2013) asserts in this regard as, "A society which cares for persons with disabilities is considered to be the best, as disability affects not only the individual and family but also society and the nation". Jha, NK and Sanyal, S (2025) expresses in the same way, "The inclusion of children with special needs is not an affair and concern of India only but it has been an important global issues and agenda for many years." What Jha and Sanyal claim about the status of school is an issue to be looked into by the government to manage learning & intellectual disabilities to get India a developed nation by 2047 and/ or even before, "This is true that policies and acts support inclusive education for children with special needs. However, most of the regular schools are not fully prepared and accessible for children with special needs."

**Let Us Know Learning Disability**

Learning disability is a neurological condition which affects the brain's ability to send, receive, and process information. A child with a learning disability may have difficulties in reading, writing, speaking, listening, understanding mathematical concepts, and with general comprehension. Wikipedia (2025) categorically defines and states about learning disability as, "Learning disability, learning disorder, or learning difficulty (British English) is a condition in the brain that causes difficulties comprehending or processing information and can be caused by several different factors. Given the 'difficulty learning in a typical manner', this does not exclude the ability to learn in a different manner. Therefore, some people can be more accurately described as having a "learning difference" thus avoiding any misconception of being disabled with a possible lack of an ability to learn and possible negative stereotyping. In the United Kingdom, the term "learning disability, while conditions such dyslexia and dyspraxia are usually referred to as 'learning difficulties'".

Learning disability is a permanent disorder that affects the manner in which individuals with normal or often above average intelligence acquires, retain,

and express difficulty in a learning area or two. Such difficulties in processing information can significantly interfere with academic or social development. Government of India (2022) by referring RPwD, 2016 states "Specific learning disabilities means a heterogeneous group of conditions wherein there is a deficit in processing language, spoken or written, that may manifest itself a difficulty to comprehend, speak, read, write, spell or to do mathematical calculations and includes such conditions as perceptual disabilities, dyslexia ( related to reading), dysgraphia(related to writing), dyscalculia (related to mathematical calculations), dyspraxia (related to coordination and movements) and developmental aphasia (related to acquisition of Language)."

Learning disabilities are traditionally diagnosed by conducting two tests and notching a significant discrepancy between their scores. These tests are an intelligence (IQ) test and a standardized achievement (reading, writing, arithmetic) test. Learning disabilities are not contagious, but they can be genetic meaning that they can be passed down in families through the genes, like many other traits we get from our parents and grand parents. Someone with a learning problem probably has other family members who have had some learning troubles too. Dyslexia is probably the number one learning disorder followed by ADHD, Dyscalculia, Dysgraphia, and Dyspraxia. Auditory Processing & Visual Processing Disorders may have trouble that affects children and adults. The most common learning disability is dyslexia, affecting approximately 80 to 90 percent of all learning disabilities as the researchers and academicians claim. Learning Disabilities –can be caused by things such as: the mother becoming ill in pregnancy, problems during the birth that stop enough oxygen getting to the brain, the unborn baby having some genes passed on from its parents that make having a learning disability more likely. They can also be caused by changes in the brain from social or environmental deprivations, deafness, poor vision, brain trauma, or neurological injury in utero. Nobody really knows that what causes a learning disability, but both genetic and environmental factors are instrumental in its happening.

Prevalence of specific learning disability in India ranges from 05% - 15% in various studies. Some studies claim the pooled prevalence of it around 8%. There appears to be a gender prediction with boys being more affected than girls. Mental health problems among people with a learning disability are often overlooked, under diagnosed and left untreated due to poor understanding, awareness, evidence in this area and symptoms mistakenly attributed to the person's learning disability. Data has shown that people with

lower intellectual ability had higher rates of symptoms of common mental health problems (25%) compared to those with average (17.2%) or above average (13.4%) intellectual functioning. One study found that 54% of people with a learning disability have a mental health problem. Children with learning disabilities are four and a half times more likely to have a mental health problem than children without a learning disability. Learning disabilities are processing problem within brain. There are three main categories disability plus others, all of which can disrupt a child's ability to learn in those areas. The three core learning disabilities affect the fundamental academic area of Reading (Dyslexia), Writing (Dysgraphia) and Mathematics (Dyscalculia). Within each area, learners experience different effects and difficulties. Besides these, other learning disabilities include auditory, language, and visual processing disorder plus non-verbal learning disorder.

The primary feature of a learning disability is that it is processing problem of the brain. In addition to learning difficulties, learners with learning disabilities can experience such things as:

- Motor skills deficits, both fine and gross.
- Problem with hand-eye coordination.
- Memory problems.
- Sensory issues.
- Troubles with attention.
- Slow processing speed.
- Difficulties with logic and reasoning.

The struggles a child with learning disability faces is varied because of the differences in each disability, but in general they involve what has been called weaknesses in certain areas of brain. Outside of this area of disability, children with learning disabilities generally do well in school. The concept, "Smart Kids with learning disabilities", is often used to describe these children having learning disability. A child can display difficulties in terms of listening, reading, solving mathematical problem, etc. These are usually viewed as learning disabilities. As learning disabilities are varied, it can be quite difficult to identify whether the child is suffering from a learning disability or not. These learning disabilities may be according to different stages of childhood. A very young child may have difficulty in identifying colours, letters, problems in pronouncing, rhyming, colouring within the lines, tying the shoe laces, etc. A much older child can

have difficulty in solving mathematics problems, reading aloud, writing, difficulty in comprehension, etc. Some of the most common learning disabilities are Dyslexia (Difficulty in reading), Dysgraphia (difficulty in writing), Dyscalculia (difficulty in mathematics), Aphasia (difficulty in language comprehensive), Auditory Processing Disorder (difficulty in hearing sound differences), and Visual Processing Disorder (difficulty in understanding maps, charts, pictures, etc.) These related issues highlight those intellectual disabilities and learning disabilities are two different things. Learning disorders are problems with the brain's ability to get, remember, or use information. These problems make it hard to focus and do well in school. Children with learning disorders often have normal or high intelligence but have problems with a specific mental skill, such as reading or doing mathematics. Learning disorders are different from intellectual disability (when children are born with lower-than-normal intelligence that causes problems with all mental skills). Doctors through a series of test see if a child has a learning disorder or not. Certain school programmes may help to recognize the child's specific trouble with respect to a learning disability or two, i.e., reading, writing and what is the problem area.

Children do not have learning disorders because they are lazy or misbehaving. A normal parent can understand intellectual disability the same as learning disability, though it is not true. Something the brain of learning-disabled children did not develop properly. Doctors do not know for sure why this happens, but learning disorders are more likely if:

- The mother was sick or used certain drugs during pregnancy.
- The mother or baby had medical complications during pregnancy.
- The child had a serious illness (such as cancer) at a young age.

Most common learning disorders are reading disorders, writing disorders, and mathematics disorders. Children who are not learning at the level appropriate to their age and ability should be tested for learning disorders.

**Types of Learning Disability**

Following are some Important Learning Disabilities as:

**1. Dyslexia:** It is the most common type of learning disabilities. It is related to language learning in which the learner has trouble in understanding words, sentences, or paragraphs. Learners suffering from dyslexia often find difficulty

in processing and understanding what they read or hear. Many dyslexic people are talented in other area of learning like arts and music, 3Dvisual perceptions, athletic and mechanical abilities. In fact, it is a specific learning disorder that affects reading and related language-based processing skills.

**2. Dyscalculia:** It is a learning disability that affects the ability to grasp and solve mathematical concepts and problems. People with dyscalculia often have difficulty in understanding and manipulating numbers. They find difficulty in remembering mathematical formulae and solving mathematical equations. They cannot recall and remember mathematical steps with ease. It is a lifelong disability and person suffering from it can be taught to achieve success as in dyslexia.

**3. Dysgraphia:** This learning disability is associated with the functioning of hand writing and fine motor skills. It is a writing disability in which people find it difficult to form letters and they get it hard to write within a specified space. People suffering from dysgraphia have handwriting that is uneven and inconsistent. Many people with dysgraphia write legibly, but write very slowly or too small. People with dysgraphia are unable to visualize letters and do not possess ability to remember the motor patterns of letters and their writing requires a lot of energy and time.

**4. Dyspraxia:** This is a disorder that affects the development of motor skills. People with dyspraxia have trouble in planning and executing fine motor skills like waving good bye to getting dressed. It influences movement & coordination, language and speech It is a lifelong disorder with no cure, but there are options for helping them to improve to function and to be independent. Psychologists do not consider it as a learning disability, but suggest that it coexists with other learning disabilities. Ona can conclude that its characteristics are similar to dysgraphia.

**5. Aphasia/Dysphasia:** Aphasia is the medical term to indicate full loss of language, while dysphasia stands for partial loss of language. The word aphasia is now commonly used to describe both conditions. Aphasia and dysphasia are communication related disorders that can develop due to a stroke, traumatic brain injury or neurological disorder. Dysphasia is related to language and communication related learning disabilities that affect the ability to understand or produce spoken language. It is associated with verbal language skills those

are like retell a story, the fluency of speech, ability to understand the meaning of words, directions understanding, etc.

**6. ADHD (Attention Deficit Hyperactivity Disabilities):** As the name suggests it is a disorder that causes people to lose focus on tasks very easily. People with ADHD find it difficult to stay focused and pay attention and are unable to control behaviour & their hyperactivity. ADHD is of two types-Hyperactive Impulsive ADHD and Inattentive ADHD. There is the third type that is a combination of the two. Hyper Impulsive ADHD is distinguished by the person's excessive amount of activity. This may include activities like constant fidgeting, non-stop talking, trouble in controlling temper, problems with doing quiet activities, etc. Inattentive ADHD includes struggle in paying attention to any instruction, too much daydreaming, slow information processing, feeling bored frequently, poorly organized, etc. There is a third type of ADHD that includes activities placed in both the category as this is due to the combination of the hyperactive and inattentive ADHD. Psychologists do believe that ADHD is not a learning disability, but it causes people to struggle with learning. They think it is commonly linked to other learning disabilities.

**7. Auditory Processing Disorders (APD):** Auditory Processing Disorders are the disorders that make the person unable to distinguish similar sounds and other difficulties in day-to-day learning. It causes trouble in learning, but psychologists do not consider it as a learning disability.

**8. Visual Processing Disorders (VPD):** Visual Processing Disorders are the disorders that cause people to struggle to differentiate between similar letters, number, objects, colours, shapes, patterns, etc. As like auditory processing disorders, visual processing disorders are also not considered as learning disability by a group of psychologists. It affects learning as the sufferers have poor hand-eye coordination.

**9. Non-verbal Learning Disorders (NLD):** Non-verbal Learning Disorders or Non-verbal Learning Disabilities are neurological syndromes that develop in the right side of the brain. People with NLD have a very strong verbal ability, remarkable memory, good spelling skills, strong auditory retention, but they possess poor social skills. They find difficulty in understanding facial expression and body language. Some people having NLD have poor coordination, balance problems and difficulty with fine motor skills.

**10. Language Processing Disorders (LPD):** Language processing disorders is a subset of auditory processing disorders. According to Learning Disabilities Association of America, in language processing disorder there is difficulty in attaching meaning to sound groups that form words, sentences, and stories.

**11. Autism:** Autism is basically an intellectual disability, but it creates difficulty in mastering certain academic skills. Children with autism may have trouble in communication, reading body language, learning basic skills, making friends, and making eye contact.

In fact, there are three main types of learning disabilities related to reading, writing and mathematics. Each of these three types of learning disability includes several different disorders. Dyslexia is reading related disability; Dysgraphia is writing related disability and Dyscalculia is mathematics related learning disability. Autism is not a learning disability, but around half of autistic people may also have a learning disability.

**Symptoms of Learning Disorders**

1. These are some symptoms of learning disability:

- Young children with learning disorders may take longer time than usual to learn.
- Names of colors, letters, or objects may not be identified during learning.
- How to count cannot be internalized by the child.
- How to read and write may not be learned by the child.

2. Children with learning disability may also have problems like:

- Short attention spans.
- Trouble paying attention.
- Speech or language problems.
- Trouble in understanding direction.
- Trouble in remembering things that happened recently.
- Trouble with hand and finger use, such as printing and copying.

Some children with learning disorders become frustrated at school. The frustration can cause behavioural problems, such as being hyperactive, shy, or aggressive. If anybody suspects that her/his child's learning difficulties may require special attention or assistance he/she must not make delay in finding support. The sooner one approaches the assistance, the better chances are there for reaching the full potential of the child. In fact, it is associated with the damage control of the child. Earlier detection of the learning disability may go in favour of the child by caring and managing the child's difficulty from beginning.

3. Children with **Dyslexia**, one type of reading disorder, have symptoms like:

- Slow to start talking and naming letters and pictures.
- Trouble making sounds for words or putting sounds in right order.
- Trouble seeing single words in a group.
- Difficulty in reading out loud.
- More spelling and writing errors than usual, such as reversing letters in words.

4. Besides some common sign and symptoms of learning disability certain age specific sign and symptoms have also been forwarded by the experts. Following are some age-related sign and symptoms of learning disability:

**(A) Signs and Symptoms of Learning Disabilities (Preschool Age):**

- Problems in pronouncing the words.
- Troubles in finding the right words.
- Difficulty in rhyming.
- Trouble in learning the alphabet, numbers, colours, shapes, or days of week.
- Difficulty in following directions or learning routines.
- Difficulty in controlling crayons, pencils, and scissors, or colouring within lines.
- Trouble in handling with buttons, zippers, snaps, or learning to tie shoes.

**(B) Signs and Symptoms of Learning Disabilities (5-9 years of ages):**

- Trouble in connection between letters and sounds.
- Difficulty in blending sounds into words.
- Confusion in reading the basic words.
- Slow rate of learning new skills.
- Frequent spelling mistakes in a consistent manner.
- Trouble in learning basic mathematical concepts.
- Difficulty in telling time and remembering sequences.

**(C) Signs and Symptoms of Learning Disabilities (10-13 years of ages):**

- Difficulty in reading comprehension or mathematics skills.
- Trouble in open-ended test questions and word problems.
- Disliking reading & writing and having tendency of avoiding reading aloud.
- Poor handwriting.
- Poor organizational skill like having messy and disorganized bedroom, homework, and desk.
- Trouble in following classroom discussions and expressing aloud.
- Spelling the same word differently in the same document.

The above discussed lists of activities in which person with learning disabilities find some common red flags, but normal children may too experience some of these difficulties at various times. Early detection of developmental differences may be an early signal of a learning disability and problems that are spotted early can be easier to correct.

**Doctors Saying about Learning Disorders**

- Doctors will test the child's hearing and eyesight to make sure those are not the cause of the child's learning problems. Hearing and vision problems are not learning disorders.
- To know for sure, they will send the child to a learning specialist (often at the child's school). The specialist will do a series of intelligence tests and ask the child reading, writing and mathematics related questions to diagnose the learning disability of the child.

## How Learning Disorder is being Treated

Learning disorders are treated through educational programmes that help children with learning disorders. For example, dyslexia are treated with programme that teaches children to identify words by paying attention to the sounds. These programmes also use audio books, computer screen readers, and other tools. Some children with learning disorders also have ADHD. Medicines that doctors prescribe for ADHD help children concentrate, which may help them to learn better.

In the United States, the Individuals with Disabilities Education Act (IDEA) require public schools to test children for learning disorders. It also requires schools to provide free and appropriate education to children with learning disorders. It is being manifested through behaviour, but opinion of a specialist is vital before coming to conclusions. Learning disability is an issue or problem the child encounters in the process of learning. This does not denote that the child has lower IQ or lacks skills, but the child differs in his/her pattern of learning.

## Types of Specialists for Diagnosing Learning Disabilities

Following group or Individual may deal with learning disabilities:

- Clinical Psychologists.
- School Psychologists.
- Child Psychologists.
- Educational Psychologists.
- Developmental Psychologists.
- Neuro Psychologists.
- Psychometrists.
- Occupational Therapists. (They test sensory disorders that can lead to learning problems.)
- Speech and Language Therapists.

Sometimes several professionals coordinate as a team to manage for an accurate diagnosis. Sunanda, G Mary (2013) also mentions specialists needed for diagnosing learning disability as clinical psychologists, school psychologist,

child psychiatrists', educational psychologists, developmental psychologists, neuropsychologist, psychometrist, occupational therapist, and speech and language therapist.

Neuroplasticity is the new hope in the area of learning disabilities treatment. It refers to the brain's natural, lifelong ability to change. It is about repairing the brain wire to remove the obstacle in the process of learning. In order to understand neuroplasticity, we may think the repairing of brain circuit like radio internal wire system. In fact, a person's brain throughout her/his life is able to form new connections and generate new brain cell in response to experience and learning. This revealed knowledge has led to groundbreaking new treatments for learning disabilities that take advantage of the brain's ability to change.

Arrowsmith programme is being used now as strategic brain exercises to identify and strengthen weak cognitive areas. The Arrowsmith programme is employing the principle of neuroplasticity through the application of targeted cognitive exercises to overcome specific learning disabilities. As for example a child having difficulty in distinguishing different sounds in words there is a new computer-based learning programme that slow down the sounds so that children can understand them and gradually increase their speed of comprehension. Under the right learning conditions, the brain has the ability to recognize itself by forming new connections. With the help of Arrowsmith programme these new connections facilitate skills of reading and writing that were difficult with the help of old connections. In fact, it is about changing, replacing or repairing brain connections. What is to know in the process is that faulty wiring in the brain disrupts normal lines of communication and makes it difficult to process information easily.

Parents of the learning-disabled child need to support the child and address their symptoms in practical ways. Further they are to get help from the professionals. Diagnosing a learning disabled is a process. It includes and involves testing, history taking, and observation under trained specialists. It is important to find a reputable referral. A professional learning disorder specialist can referrer to the importance of integration to learning. Integration refers to the understanding of information that has been delivered to the brain, and it includes three steps as:

1. Sequencing: It means putting information in right order.
2. Abstraction: It means making sense of the information.

3. Organization: It is to organize the learning content. In fact, it is associated with the brains ability to use the information to form complete thoughts.

Each of these three steps is important and a child may have a weakness in one area or another that causes learning difficulty. The role of parents and guardians is important in this context. They besides turning to specialist and specialized academic help by school must learn and think to help the child as they know the child in a better manner. They need to take lead in looking into opinions, learning about new treatments and services, and observing the child's education.

Parents role and monitoring is the key in the treatment of learning disabilities. They can do following act and activities in this regard:

- They need to learn the specifics of their child's learning disability.
- They can research about treatments, available services, and new theories.
- They can pursue treatment and services at home.
- They can nurture their child's strengths and specific abilities.
- They can manage their ward's social and emotional skills. Learning disabilities may be extremely frustrating at times and they must know social and emotional skills are the most consistent indicators of success in life. This true in the case of learning disorder as well.
- They need to manage self-esteem, isolation, and behavior problems of their wards as learning disabilities and their accompanying academic challenges can affect these aspects.
- They have to provide their wards strong support system to make them learned to express, deal frustration, and work with challenges.
- They need to focus on child's growth as a person, and not just on academic achievements.
- They need to help their child to learn good emotional habits that set the stage for their child's success throughout their lives.
- They need to create and develop a group of parents and guardians of learning-disabled children to share concerned knowledge. This will lead the creation of great sources of knowledge about learning disabilities, its management, and a group for emotional support for the children.

## Let Us Know Intellectual Disability

Intellectual disability (ID), also known as general learning disability in the United Kingdom. Formerly it was named as Mental Retardation (MR). In fact, it is known by different term as General Learning Disability, Mental Retardation, a Generalized Neurodevelopmental disorder. It is a generalized Neurodevelopmental disorder characterized by significantly impaired intellectual and adaptive functioning. It is defined by an IQ under 70. It is deficits in two or more adaptive behaviours that affect everyday general living. Government of India (2022) defines the concept, "Intellectual disability refers to significant impairment in cognitive and adaptive functioning. It causes difficulties in problem solving, reasoning and learning".

Intellectual functions are defined under Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-V) - a book by American Psychiatric Association, as reasoning, problem solving, planning, abstract thinking, judgement, academic learning, and learning from instruction and experience, and practical understanding confirmed by both clinical assessment and standardized tests. Adaptive behaviour is defined in terms of conceptual, social, and practical skills involving tasks performed by people in their everyday lives. Wikipedia (2024) states about the concept , "Intellectual disability (ID), also known as general learning disability (in the United Kingdom), and formerly mental retardation (in the United States) is a generalized neurodevelopmental disorder characterized by significant impairment in Intellectual and adaptive functioning that is first apparent during childhood. Children with intellectual disabilities typically have an intellectual quotient (IQ) below 70 and deficits in at least two adaptive behaviours that affect every day living. According to the DSM-5, intellectual functions include reasoning, problem solving, planning abstract thinking, judgement, academic learning, and learning from experience. Deficits in these functions must be confirmed by clinical evaluation and individualized standard IQ testing. On the other hand, adaptive behaviours include the social, developmental, and practical skills people learn to perform tasks in their everyday lives. Deficits in adaptive functioning often compromise an individual's independence and ability to meet their social responsibility."

Intellectual disability is subdivided into (1) Syndromic Intellectual Disability, in which intellectual deficits associated with other medical and behavioural signs and symptoms are present, and (2) Non-syndromic Intellectual Disability, in

which intellectual deficits appear without other abnormalities. Down syndrome and fragile X syndrome are examples of syndromic intellectual disabilities. Intellectual disability affects about 2 to 3% of the general population. Seventy-five to ninety percent of the affected people have mild intellectual disability. Non-syndromic or idiopathic cases account for 30 to 50% of these cases. About a quarter of cases are caused by a genetic disorder and about 5% of cases are inherited from a person's parents. Cases of unknown cause also affect the people in a large way. Intellectual disability when named as Mental Retardation as a connotation was so derogatory that an official change was made. Children with intellectual disabilities have problems in two main areas. (i) Intellectual Functioning and (ii) Adaptive Behaviours.

Intellectual functioning involves someone's learning, problem solving, decision making and reasoning. It is represented by I.Q. The average IQ is 100, and the average range is 85-115. Someone with an intellectual disability has an IQ of 75 or below. It is also claimed as below 70. Learning disabilities, on the other hand, do not affect IQ or general intellectual functioning. Adaptive behaviours are skills everyone needs to function in daily life. These are conceptual skills like language, literacy, money concept, self-direction, and more. Practical skills like personal care, self-direction, ability to use the phone, and occupational skills are part of adaptive behaviour. The other set of adaptive behaviours involves social skills and functioning. Someone with an intellectual disability has poor adaptive behaviour. There are many kinds of intellectual disabilities and there are many cases of it. Intellectual disability is the most common developmental disability. Intellectual disability is a term used when a person has certain limitations in cognitive functioning and skills, including communication, social and self-care skills. These limitations can cause a child to develop and learn more slowly or differently than a typically developing child. Intellectual disability can happen any time before a child turns 18 years old. It can happen even before the birth. According to American Association of Intellectual and Developmental Disabilities, an individual has intellectual disability if he or she meets three criteria:

1. IQ is below 70-75.
2. There are significant limitations in two or more adaptive areas (skills that are needed to live, work, and play in the community, such as communication or self-care).
3. The condition manifests itself before the age of 18.

## Causes of Intellectual Disability

Intellectual Disability can be caused by injury, disease, a problem in the brain. There are unknown causes of intellectual disability. Down Syndrome, Fetal Alcohol Syndrome, Fragile X Syndrome, Birth Defects, Infections before Birth, Infection during Birth and Infection soon after Birth. Other causes of intellectual disability do not occur until a child is older. These might include severe head injury, different types of infections or stroke. Following are some causes of Intellectual Disability in terms of genetic, physical and environmental factors. Broadly we can classify the reasons of intellectual disability in terms genetic, physical and environmental.

(1) **Genetic** – This is due to the presence of abnormal genes that have been inherited from family members and it is also caused when genes are being combined during prenatal development. 25% of cases of Intellectual Disability are due to metabolic abnormalities, such as those that cause Fragile X syndrome and Down syndrome.

(2) **Physical** – Infections or diseases, extreme malnutrition. Intake of poisonous substances like lead, mercury during pregnancy are the causes of intellectual disability. Whooping cough, the measles, meningitis, extreme malnutrition, lack of medical care, etc. may be the reasons of intellectual disability. An intellectual disability is not a disease, it is a disorder. It has no cure, but children with intellectual disability can learn to do many things with restricted speed.

(3) **Environmental** - Prenatal risks, radiation, maternal malnutrition, alcohol use by mother, oxygen deprivation, traumatic brain injury, suffering from severe malnutrition and suffering from a near drowning experience, etc. are the reasons of intellectual disability.

Based upon genetic, Physical and Environmental reasons we may have some specific reasons of intellectual disability as:

a. **Genetic Conditions**: Due to abnormal genes inherited from parents, error when genes combine, or other reasons. Examples of genetic conditions as cause of intellectual disability are Down Syndrome, Fragile X Syndrome, and Phenylketonuria (PKU).

b. **Complications during Pregnancy**: When the baby does not develop inside the mother properly (problem with the way the baby's cell divide). A woman who drinks alcohol or gets an infection like rubella during pregnancy may also have a baby with an intellectual disability.

c. **Problems during Birth**: Complication during labour and birth. When a baby not getting enough oxygen, he/she may have an intellectual disability.

d. **Diseases or Toxic Exposure**: Diseases like whooping cough, the measles, or meningitis can cause intellectual disabilities. This can also be caused by extreme malnutrition, not getting appropriate medical care, or by being exposed to poisons like lead or mercury.

Intellectual disability is not contagious i.e., communicable disease. One cannot catch an intellectual disability from anyone else. It is not a type of mental illness, like depression. There are no cures for intellectual disability. However, children with intellectual disability can learn to do many things. They may just need to take more time or learn differently than other children. 1 to 3% of global population has an intellectual disability. Intellectual disability is significantly more common in low-income countries. 80% of all people with disabilities live in low-income countries. United Nation narrates Intellectual Disability a disability that describes a person with certain limitations in cognitive functioning and other skills, including communication.

## Types of Intellectual Disability

Following are some types of intellectual disability as:

**1. Fragile X Syndrome** is a genetic condition that affects a person's development, especially behaviour and the ability to learn. Fragile X results from a change or mutation in the Fragile X Messenger Ribonucleoprotien 1(FMR1) gene, which is found on the X chromosome. The gene normally makes a protein, called FMRP, that is important for creating and maintaining connections between cells in the brain and nervous system. Symptoms are often milder in females than males. The gene for Fragile X is carried on the X chromosome. Men pass the premutation only to their daughters, but the women to both as male has XY and the female has XX combination of chromosomes. Boy comes with the combination as X from mother and Y from father, girl comes due to X from both the sides.

**2. Down Syndrome**: Down syndrome is caused by random error in cell division that results in the presence of an extra copy of chromosome. It describes a set of cognitive and physical symptoms that result from having an extra copy or part of a copy of chromosome 21. It is a genetic disorder and it seems to

occur more among males than females. It is also due to more age of the mother at birth of the children. It is a life long condition. It is not inherited. Medical term for having an extra copy of a chromosomes is Trisomy, and due to this Down Syndrome is also referred to as Trisomy 21.

**3. Rett Syndrome** is a rare genetic neurological and developmental disorders that affects the way the brain develops. It primarily affects females. It causes a progressive loss of motor skills and language. Most babies with Rett Syndrome seem to develop as expected for the first six months of life. the Babies then loss the abilities like crawl, walk, communicate, use of hands. The vital changes generally occur at 12 to 18 months of age. Its major symptoms are slow growth of body parts, loss of movement and coordination abilities, loss of communication abilities, unusual hard movements, unusual eye movements, breathing problems, etc. The genetic change that causes Rett Syndrome is spontaneous, meaning that it happens randomly. Such random mutations are usually not inherited or passed from one generation to another. However, very few cases find it as inherited. Male children if acquire this syndrome die at birth or in early infancy as they have different chromosome combination from female children. It has been observed it has four stages as - 6-8 months of age;1-4 years of age;2-10 years of age; and After 10 years of age.

**4. Autism** is a complex neurological and developmental condition that affects how a person learns, communicates and interacts with other. Autism formally called autism spectrum disorder (ASD) or Autism Spectrum Condition (ASC). In fact, is a Neurodevelopmental disorder characterized by deficits in social communication and social interaction, and repetitive or restricted patterns of behaviours, interests, or activities. It can include hyper and hyperreactivity to sensory input. Autism is a spectrum disorder; it means it can manifest very differently in each person. There are three main causes of it as environmental factor, biological factor and genetic factor. It is also due to older parents, a sibling with autism, certain genetic conditions like Down syndrome, Fragile X syndrome and Rett syndrome. This disorder causes a progressive loss of motor skills and language. It primarily affects female babies, very low birth weight, etc are the common causes of autism. Autism is a lifelong developmental disability that affects how people communicate and interact with the world. A group of psychologists claim that it is a myth that all autistic has intellectual disability. They find two third of the people on autistic spectrum as having average and above average IQs.

**5. Other Intellectual Disabilities**: There are many other types of intellectual disabilities – some have known causes, while others remain unknown. Biologists, psychologist and educationists are working continuously and revealing some facts every moment. **Signs of Intellectual Disability**

Following are few signs of persons having intellectual disabilities:

- They sit up, crawl, or walk later than other children.
- They learn to talk later or have trouble in speaking.
- They find it hard to remember things.
- They have trouble in understanding social rules.
- They have trouble in solving all kinds of problems.

**Care and Educational Needs of Intellectually Disabled** Intellectual disabled persons need care in following ways

- Improved medical treatment of organic conditions.
- Parent education to understand the child and deal the child effectively.
- Special Type of schooling.
- Vocational training.
- Sheltered workshops.
- Residential care.

Intellectual disability cannot be cured in a complete sense. When a diagnosis is provided early in a child's life and interventions are properly implemented children are able to achieve a quality life. While walking and talking later than other are its sign and symptoms, but it becomes prominent once children are in an academic setting. Early interventions and ongoing support can allow children to improve their adaptive functionary and learn many skills that will allow them to thrive in life. Skill that will allow them to reach their full potential be identified and provided.

**Effects of Intellectual Disability**

Intellectual disability affects in following manner:

- Memory problems.
- Attention problems.

- Difficulties in interacting socially.
- Impaired self-esteem or lowered sense of self-worth.
- Difficulties in finding and maintaining employment as adults.
- Being unable to live on one's own due to required assistance and supervision.
- Presence of additional medical concerns.

**Co-occurring Disorders caused by Intellectual Disability** Following are the disorders associated with Intellectual Disorders as:

- Mood disorders.
- Anxiety disorders.
- Depressive disorders.
- Impulse control disorders.
- Attention-deficit/hyperactivity disorder.
- Autism spectrum disorder.
- Aggression.
- Self-help.

**Difference and Similarities between Intellectual Disability and Learning Disability**

Intellectual disability is a Neurodevelopmental disorder that affects one's social, academic, communication, and daily life functions. Until few years intellectual disability was called mental retardation, but now it is being used for people who have an intelligence level below average. Learning disability is a condition which affects the different area of learning and interferes with the academic achievements of the individual. It includes reading, writing, comprehending and organizing language and mathematics. There are evidences of the genetically influenced disabilities- learning, intellectual and developmental. Intellectual disability is about below average intelligence. Learning disability is about difficulty in the process of learning. A person with intellectual disability usually finds difficulty in performing day to day activities and he/she lacks necessary skills. A person with learning disability finds difficulty in reading, writing, speaking, listening, solving mathematical problems, calculations, etc. A person with intellectual disability possesses lower IQ. A person with learning disability possesses average or above average IQ. A person with intellectual

disability displays frustration, anger and difficulty in remembering, eating, dressing, managing, decision making, learning, etc. Learning disability is in terms of difficulty in learning and its identification is more difficult and needs expertise.

Following are some Specific Differences in LD and ID as:

**1. Definition: Intellectual disability** is a type of neurological disability in which people's social life gets affected, and their interaction skill also decreases. Person with learning disability read and write slowly but is intelligent in other ways from an average person.

**2. Area of Dysfunction:** An individual with intellectual disability displays intelligence below average and an individual with learning disability gets difficulty in the process of learning. An individual with IQ below 70 would be labelled as intellectually disabled. It affects – communication, self help, academic achievements, sensory and motor skills, memory, reasoning and decision making. etc. Learning disability is confined to difficulties in area pertaining to learning skills like – reading, writing, understanding, visual processing, etc. The IQ of a learning-disabled person may be average or above average and he/she may show no difficulty in communication or self-help skills.

**3. Typical Features:** Intellectual disability can be diagnosed earlier than learning disability. We can find three differential criteria for intellectual disability:

(i) Deficit in intellectual functions – reasoning, problem solving, listening, abstract thinking, academic and social learning.

(ii) Deficit in adaptive functioning – difficulty in adapting to the environment and development standards inappropriate to age and culture.

(iii) The onset of (i) and (ii) in childhood or adolescence.

The feature of learning disability circles around reading, writing and comprehension. A learning disabled can be a fully functioning individual in all aspects except for academic areas. The characteristics features include: poor reading/ writing/comprehension/mathematical skills; poor reading/ writing/ decoding fluency; inability to compose; complete and organize written information; poor handwriting and spelling; difficulty in memorizing and relating information; poor mathematical skills; etc.

**4. Classifications**: On the basis of IQ Intellectual disability is classified into different sub-types where severity of disability increases with decreasing IQ as mild intellectual disability (50-70), moderate intellectual disability (35-49), severe intellectual disability (20-34) and profound intellectual disability (less than 20). Learning disability is classified on the basis of the area of difficulty. The sub-types of learning disability are as Dyslexia (reading and language-based difficulty), Dysgraphia (writing skill, poor handwriting, and weak motor skills etc. related difficulties), Dyscalculia (difficulty in solving mathematical problems), Other specific learning disabilities like Auditory Processing Disorder, Language Processing Disorder, Non-verbal Learning disability, etc.

**5. Impact on Normal Functioning**: There is huge difference between intellectual disability and learning disability when it comes to daily life functions. An intellectually disabled finds it very difficult to perform normal tasks of daily life in comparison to other people of the same age. Their work a day jobs like self care, communication, interpersonal relationships, making friends, average academic achievements, etc. get dysfunctional. The degree of dysfunction varies. A mildly disabled individual has less difficulty in his daily and normal functions than a severe or profound intellectual disabled one. Some people even need continued external care giving throughout his/her life. The impact of learning disability on daily life functions is relatively less. This is why early diagnosis of learning disability is rare. Academic under achievement is what leads to the investigations. The person otherwise may be perfectly normal in terms of social and physical development.

**6. Treatment**: The special education and therapeutic methods followed for treating the intellectually and learning disabled are different. The intellectual disabled individuals have dysfunctions in basic life skills like communication, self-help or academic achievements. The treatment methods of intellectual disability include – speech therapy, communication interventions, behaviour therapies, medication, etc. Treatment strategies differ according to the severity of the disability. A mild intellectually disabled person is ideally capable of taking his/her own medical and financial responsibilities. The occupational and the behavioural therapies they undergo are different from the severe or profound disabled individuals.

Learning disability is specific in areas like reading, writing, mathematics, spellings, etc. and so the treatment of learning disabled focuses on improving only the specific area and an overall therapy for communication or life skills may not be required. The special education techniques include:

**(a)** Dyslexia – Special teaching techniques providing multi sensory experiences and feedbacks, classroom modifications catering to individual needs, using technological ways like listening to books on tape or using computerized spell check software, etc.

**(b)** Dysgraphia – Special tools like oral examination instead of written ones, using audio-visual mode of teaching, etc.

**(c)** Dyscalculia – Visual techniques for learning, using memory aids and computers for solving problems, etc.

**(d)** Others – As per the area of the learning disabilities other learning disabilities are treated.

There are very few ways in which learning disability can be associated with intellectual disability. One thing is that out of the different problems that intellectually disabled people face, difficulty in reading or writing may be one. But if we look into the casual factors, they are not the same. The specific areas of brain that are responsible for causing learning disorders/disabilities are different from the physiological factors causing intellectual disorders. However, extensive researches are still going on that would hopefully ascertain the relationship between them in the coming years.

**7. Characteristics**: A person with an intellectual disability may have difficulty in carrying out daily activities as she/he lacks necessary skills. Person with learning disability do not have difficulty in carrying out daily activities. They display disabilities in terms of listening, reading, writing, speaking, mathematical problem solving and calculation, etc.

**8. IQ Level**: An individual with intellectual disability displays a lower IQ. An individual with learning disability does not display a lower IQ.

**9. Signs and Symptoms:** A person with intellectual disability displays uncontrollable anger and frustration, have difficulty in remembering things and taking care of oneself such as eating, dressing, and encounter difficulties in communicating effectively, solving problems, reasoning, making decisions and learning. A person with learning disability cannot be identified easily as learning disability is varied and differ according to different stages of childhood.

**10. Type of Disorder:** Intellectual disability is a neurological disorder. Learning disability is also related to neuron disability.

**11. Affect:** Intellectual disability affects people's social life and communication skills. Learning disability affects learning, reading, solving mathematical problems and understanding ability.

**12. Level of Cure:** In intellectual disability recovery level is high and proper help can balance the situation. In learning disability there is no proper help for this, and this disorder can become lifelong or chromic.

**13. Affected Area:** In intellectual disability communication skill, memory, logical reasoning etc. are affected. In learning disability reading, writing, understanding, etc. are affected.

**14. Treatment or Therapy:** For intellectual disability speech therapy, medication, counseling, etc. are employed. For learning disability visual techniques, logic building classes, etc. are employed.

Both these disabilities can be seen in the early life of a person or during childhood. One more important area of comparing Learning Disability Vs Intellectual Disability is education. Both-kids with a learning disability and those with intellectual disability can attend school and learn. A child with a learning disability has difficulty in a specific area related to their disability. The reading disorder dyslexia does not affect mathematics learning. Someone with an intellectual disability, though, has learning deficits across the broader area of learning. Their learning takes longer than other children (including students with learning disabilities, as they are slower only in their area of learning disability).

There is one more important similarity between them. Like all children, these kids have strength and abilities that can be nurtured. They can go to school and function and grow in their own ways. Learning disabilities are considered to be high incidence disabilities. One in 59 kids or 1.69 percent of kids live with one or more learning disabilities. One in five, or 20 percent, has learning and attention issues. Kids with learning disabilities are 31% more likely to be bullied than their classmates without a learning disability. About 45% of parents indicated in a survey that their child had been bullied. Boys make up about two-thirds of the students identified with a learning disability even though research also shows that boys and girls have equal rates of learning disorders. One standardized test for reading and mathematics, only 12 to 26 percent of students with learning disability scored in average- to above average range compared to half of non-learning-disabled students. Of kids with ADHD, 11% of them also have dyscalculia (mathematics related learning disability).

Dyslexia is the most common learning disability, with 20% of children in special education for a learning disability estimated to have dyslexia. Approximately one-third people with learning disabilities also have Attention Deficit Hyperactivity Disorder (ADHD). To have information's and statistics are necessary for reliable estimates.

**Services Useful for Taking Care of Intellectual Disability and Specific Learning Disabilities**

Following are some services useful for both types of disability:

1. **Occupational Therapy**: It helps to develop and maintain skills for daily living. It is a long-term therapy and focuses on dressing, feeding, play… etc. It is more useful for Intellectual Disability.

2. **Psychology** – It is the study of behaviour and mind. It embraces all aspects of conscious and unconscious experiences and uses talk therapy treatment. It is useful for both the disabilities.

3. **Speech Therapy** – It helps people with speech and language problems to speak more clearly. It is useful for both the disabilities.

4. **Psychiatry** – It is the treatment of medical disorders and prescribes medication. It is also useful for both the disabilities.

5. **Special Education** - It helps to manage the specific needs of children with intellectual challenges. It is more useful for intellectual disability.

6. **Physiotherapy** – It focuses on mobility, physical activity and overall health and well-being. It is more useful for intellectual disability.

7. **Vocational Therapy** - It helps individuals to gain productive employment by developing skills and identifying appropriate jobs. It is useful for both the disabilities.

8. **Counselling** – It helps the caregivers and the children with challenges and talk about problems and feelings in a confidential setting. This talk helps disabled and guardian to tackle the disability in a confident manner. It is useful for both the disabilities

9. **Residential Care** – It is a long-term care given to adults or children who stay in a residential setting rather than in their own home or family home. It helps to grow both types of disabled with a more supporting environment.

10. **Lawyers and Advocates** – Lawyers and Advocates help affected person and the family with challenges to fight for their rights. It is useful for both types of disabled.
11. **Special School** – There are schools specifically designed, staffed and resourced to provide appropriate for children with special needs. It is more useful for intellectually disabled learners, though there is the need to open more such schools for learning disabled as well.
12. **Hospitals** – They offer a variety of services under one roof for individuals with challenges. It is being developed categorically for the help of both types of disabled separately.
13. **Pediatricians** – These child specialist doctors help infants and children in many ways. It is to early detection, medication, counseling and guidance. It is useful for both types of disabled.
14. **Daycare Centers** – These centers are for children with challenges. These are specialist centers providing daycare facilities to children and young adults with disabilities. Such centers contain related facilities and specially trained manpower to help the disabled. These types of centers may be specific in nature to support one group of disabled or other or both.
15. **Employment Services** – There are details of employers who employ persons with challenges. These centers help both types of disabled to make them earn.
16. **Cardiologist** –Heart specialist doctors are called cardiologist. This group of specialist doctor helps prevent and treat abnormalities and diseases of the heart and cardiovascular system. Both group of disabled need cardiologist's support.
17. **Dentist** – Dentist is a doctor who helps prevent and treat abnormalities and diseases of the mouth, in particular the teeth and gems. Both group of disabled need their service.
18. **ENT Specialist** – This group of doctors who specialize in treatment of disorders and diseases of the ears, nose, and throat are also needed by both group of people having intellectual disability or learning disability of even both.
19. **Ophthalmologist** – This group of doctors who specialize in treatment of disorders and diseases of the eye are also needed by both the group of disabled.

**Skills Important for Adaptive Behaviour**

Adaptive behaviour skills include communication and social skills. It also includes personal care skills like eating, dressing and grooming. Adaptive behaviour is the collection of conceptual, social and practical skills that have been learned by people in order to function in their everyday life in a proper manner. Adaptive behaviour assessments are used in evaluation of students with learning and intellectual disabilities both, though it is more particular to intellectually disabled children. This behaviour internalization makes both types of disabled to handle day to day life situations in an appropriate manner.

- **Daily Living Skills**: such as getting dressed, going to the bathroom, and feeding one's self.
- **Communication Skills:** such as understanding what is said and being able to answer.
- **Social Skills:** dealing with peers, family members, adults, and others.

**How to Help the Disabled**

Following are the major help to be provided to the disabled :

- Early Intervention to help the children.
- Individualized family services plan.
- Special education and related services for school-going children.
- Individualized education programme.

**Educational Considerations for Disabled**

Disabled need careful educational support as:

- **1. General Education**: same curriculum that learners without disabilities go through.
- **2. Supplementary Aids and Services:** This category requires many steps to take as:

**(A) Adaptive Skills**:

Children with disability, more particularly intellectual disability need help with adaptive skills, which are skills needed to live, work and play in community. Some of these skills include:

- Communicating with others.
- Taking care of personal needs (dressing, bathing).
- Health and safety.

- Home living – helping to set the table, cleaning the house or cooking dinner).
- Social Skills – manners, knowing the rules of conversation, getting along in a group, playing a game.
- Reading, wiring, and basic mathematics.
- As they get older, skills that will help them in the workplace.

**(B) Transition Planning**:

It is extremely important for families and school to begin planning early for the student's transition into the world of adults.

**(C) Tips for Teachers**:

Teachers of disabled need to understand few aspects as:

- Learn as much as you can about intellectual/learning disability.
- Recognize that you can make enormous differences in this student's life.
- Ask for a copy of his/her Individualized Education Programme (IEP).
- Be as concrete as possible.
- Break longer, new tasks into small steps.
- Give students immediate feedback.
- Teach the students life skills.
- Work together with the student's parents and other school personnel.

**(D) Tips for Parents**:

Parents of disabled need to understand few aspects as:

- Learn about intellectual/learning disability.
- Be patient and hopeful.
- Encourage independence in your child.
- Give your child chores (keep her age, attention span, and abilities in mind).
- Break down jobs into smaller steps.
- Give your child frequent feedback.
- Find out what skills your child is learning at school.
- Find opportunity in your community for social activities.
- Talk to other parents (whose children have intellectual disability)
- Meet with the school and develop an IEP to address your child's needs.
- Take pleasure in your beautiful one.

These tips are more useful for the teachers and parents of intellectual disabled, but learning-disabled children also get benefited from these. No doubt, adaptive behaviour is more useful for intellectually disabled, but we can experiment it with learning disabled as well.

**What We Need to Do @ Bharat 2047 to Managing LD & ID?**

India will be the world power and a developed nation by 2047 only if it identifies, trains, manages, and enriches its differently abled person. More particularly it has to look after the learning and intellectual disabled population of the Bharat to be developed nation and the super power of the globe. At this juncture it is suitable to mention Kumbhar, VM (2025) as he discusses status of development in terms of GDP, Per Capita Income, Unemployment Rate, Human Development Index, Inflation Rate, Life Expectancy, Population, Higher Education Enrolment, Share in Global Exports, Physical Quality of Life Index, Global Happiness Index, etc. Many among these aspects are directly associated with the caring of disabled population and their development. What he has suggested in terms of Human Development Index (HDI) is more specific and in this context India's HDI is 0.610 as compared to US (0.926) and Switzerland (0.967) which reflects need for substantial improvements in education, healthcare, and essential public services. In nutshell he concludes, "In summary, while challenges remain, a concerted effort towards implementing inclusive economic policies, improving infrastructure, and promoting social welfare will pave the way for India to emerge as a developed economy by 2047". Government of India (2022) by understanding the need of the youth of the country herself suggests for preparing schools for addressing and nurturing mental and emotional well- beings of students, integrating school curriculum with mental and emotional well-being at all stages of education, recognizing the role of teachers in supporting social and emotional learning, and Schools to have parameters of assessing social and emotional competencies of students.

More particularly for managing leaning and intellectual disability of our children to make India the developed nation by 2047 following measures are to be looked into:

- **Early Identifying and Enriching Programme for the Disabled.** Natarajan, P (2013) rightly asserts, "If babies are screened at birth and in the first 3 years, most disabilities can be identified. There are however not adequate referral centres in our country, where babies can be sent for Early Intervention. This strategy for 0-6 years requires a multi-disciplinary approach. However, with physio therapy, speech and occupational therapies

and special education, children can be taught many skills and made ready for schools". NCF (2005) also suggests for early intervention, "Disadvantages in education arising from inequalities of gender, caste, language, culture, religion or disabilities need to be addressed directly, not only through policies and schemes but also through the design and selection of learning tasks and pedagogic practices, right from the period of early childhood".

- **Making the Mass Aware and Training Them (more particularly the Parents) Regarding Disability.**
- **Handling the Challenges of its Identification caused by Language Diversity and Socioeconomic Disparities of the Nation.**
- **Focusing on Early Completion of Child Birth by the Parent as Parental Age is a Vital Cause of Children Disability.**
- **Management of Proper Education Facility for the Disabled Children of the Nation.**
- **Taking Care of Mental and Emotional Health of Disabled.** Editorial (2013) of Yojana states, "According to some studies depression is among the top causes of loss measured in term of disability adjusted life years. The case of people living with a mental ailment thus, needs to be looked carefully since many intricate issues are involved in it".
- **Developing a Well-defined National Programme of Wholistic Nature for the Development of Disabled and their Welfare.**

Training the teachers in handling and managing disabled learners through special teacher preparation programme NEP (2020) address learners' disabilities issues in length and wish to ensure quality education to Children with Special Needs (CWSN). It further assures for the implementation of the RPwD Act, 2016 in merits and sprit. Special educators, special and common schools as per need, home- based education and school along with its audit, technology-based solution, parent's evaluation and training, and how to teach children with specific disabilities are to be an integral part of all teacher education programme. Government of India needs to look into the teacher preparation issues as mentioned by scholars like Singal, N (2013) where it is pleaded, "The lack of teacher preparation and training in responding to the needs of children with disabilities is noted even by the National Council for Teacher Education (2010:12), which reflects on the inadequate preparation of teachers to address diversity in the classroom".

- **Preparing Self-help Group and following Brokering Model meant for Disability Management.** Dey, Arunima (2016) also suggests for culture brokering model for dealing with people with disability, "This concept is mainly used by the health care researchers to describe how the health care professionals from the patient's community often help the patient to understand how health services operate and how to obtain services from it".
- **Specific as well as General Nature of Curriculum for the Learning and Intellectually Disabled Children in a truly Inclusive Environment in an Inclusive School Set-up.** NCFFSE (2023) rightly concludes, "To be truly inclusive, all schools must be prepared to give meaningful and effective educational opportunities for students with disabilities". It further puts emphasis on students with and without disabilities learn together, arrangements for barrier free structures; early identification and early intervention for children with developmental delays, disabilities, and children at risk; and suitable curricular and pedagogical accommodations. Editorial (2016) of Yojana also expresses the similar view, "There is now a school of thought that the differently abled should not be going to special school but integrated with the regular schools as part of creating an inclusive environment. Social and cultural integration, is still an issue. But even this will surely change soon and the differently abled will be perceived as an integral and vital component of our society and nation".

From the side of the Government of India Thakur, A. S (2023) assures, though in general term not in specific term with Disabled population, but it is not enough, "The youth of the nation will be critical asset for the development; key for social and societal change; and driving force for economic development and technological innovation. The government is leaving no stone unturned to ensure that the youth are sufficiently skilled to compare at the global job market". For the proper management and enrichment of Indian intellectual- disabled and learning-disabled youth population what Sharma, L and Rao, KVS (2025) suggest needs to be adopted by the nation, "From now and till 2047 as per our view, we need to focus on 4 important pillars which will help the disability sector to climb new heights. These pillars are: 1. Early Identification & intervention 2. Inclusive Education 3. Skill Development, 4. Entrepreneurship. They cannot be achieved without the support of physical and human, technological and financial backing." What Gautam, D and Sharma, K (2025)

recommends to the policy makers and stakeholders to enhance the impact of the RPwD Act 2016 are also true for the development of India as developed nation by managing Learning and Intellectual Disabilities. They recommend for Strengthening Infrastructure Development; Awareness and Training Programs; Monitoring and Accountability; Incentives for Compliance; Collaboration with Disability Advocacy Groups; Promoting Assistive Techniques; and Fostering Inclusive Education and Employment.

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# Higher Education in the Digital Age: Possibilities and Challenges

## Abstract

*National Education Policy (NEP) 2020 of India broadly aims to revolutionize the Indian Education System by integrating digital technology to enhance accessibility, quality, and equity in education. Thus, it aims to build the foundation of education based on the Constitutional values. The policy emphasizes the modernization of education through digital tools, aiming to fill gaps in equity and academics. This is a high ideal which if put into practice would revolutionise not only our educational system but the society, polity and nation.*

*It is also pertinent to note that the NEP 2020 is committed to recognizing, identifying, and fostering the unique capabilities of each student, by sensitizing teachers as well as parents to promote each student's holistic development in both academic and non-academic spheres. Further it talks of full equity and inclusion as the cornerstone of all educational decisions to ensure that all students are able to thrive in the education system.*

*While the history, heritage and horizon of the country provides enormous scope for the above mentioned goals and objectives, the challenges in accomplishing these objectives also need to be taken into serious consideration and probable action. It is undeniable that the unprecedented digital development has resulted in unprecedented innovation and accessibility in education. But it has also posed a challenge that the students now rely more on technology than the classroom teaching. If our educational policies, programs, pedagogies, systems and structures do not seriously and systematically work out a blend between digital growth and constitutional cum human values, then the country would produce malicks, bureaucrats and babus but not citizens who abide for, by and of the history, heritage and horizon of our country. If this is not attempted early, it would be too late to rectify our education, environment and existence.*

***Keywords:*** *Higher Education, Digital Age, Possibilities, Challenges, Heritage, Horizon*

## Introduction

National Education Policy (NEP) 2020 of India broadly aims to revolutionize the Indian education system by integrating digital technology to enhance accessibility, quality, and equity in education. Thus, it aims to build the foundation of education based on the Constitutional values. The policy emphasizes the modernization of education through digital tools, aiming to fill gaps in equity and academics. This is a high ideal which if put into practice would revolutionise not only our educational system but the society, polity, economy, education, and nation.

Linking Digital India Campaign and Education, NEP 2020 states "India is a global leader in information and communication technology and in other cutting-edge domains, such as space. The Digital India Campaign is helping to transform the entire nation into a digitally empowered society and knowledge economy. While education will play a critical role in this transformation, technology itself will play an important role in the improvement of educational processes and outcomes; thus, the relationship between technology and education at all levels is bi-directional".

It is a given fact that digital and technological development has been unprecedented and unimagined. It is affecting all aspects of human life. While modern education contributed to the development of digital age, digital technology in turn is influencing all aspects of human life. The growth and reach of the digital technology is slowly engulfing the various streams of our life and work.

People are of the view that digital technology is so broad today as to encompass almost everything. No product is made today, no person moves today, nothing is collected, analyzed or communicated without some 'digital technology' being an integral part of it. That, in itself, speaks to the overwhelming nature of digital technology. It is so useful that in short order it has become an integral part of all of our lives.

Possibly 40 years before this was not thought off. May be those involved in the technological development and the scientists had some idea of what is coming. But common global citizens were not even aware of this revolution. It is bombarding the human beings all over that it would be impossible to carry out our life without the digital world. But it should also be kept in mind that digital world has not reached or affected all the citizens in the same manner.

Paul Saffo, a leading Silicon-Valley-based technological forecaster and consulting professor in the School of Engineering at Stanford University, said, "I have had an email address on my business card since 1982, and carry enough electronics on my person to get nervous in lightning storms. Digital connectivity has become like oxygen, utterly essential to my research. The net effect of these innovations has been to tie me more closely to other individuals and extend my interpersonal connections well beyond the pre-internet links of in-person interactions and telecommunications". It is this sense of the digital users which is worth taking note of and addressing the issues around it.

Various studies have highlighted this central fact that higher education is at an inflection point, driven by global trends such as digitalization, the personalization of learning, and the integration of emerging technologies. These changes are redefining the educational landscape, forcing institutions to adapt and develop innovative strategies that respond to the needs of a technologically advanced society. The massification of higher education poses unique challenges and opportunities, by increasing access to learning, but also by demanding more adaptive and personalized teaching methods.

It is also pertinent to note that the NEP 2020 is committed to recognizing, identifying, and fostering the unique capabilities of each student, by sensitizing teachers as well as parents to promote each student's holistic development in both academic and non-academic spheres. Further it talks of full equity and inclusion as the cornerstone of all educational decisions to ensure that all students are able to thrive in the education system.

While the history, heritage and horizon of the country provides enormous scope for the above mentioned goals and objectives, the challenges in accomplishing these objectives also need to be taken into serious consideration and plan probable action. It is undeniable that the unprecedented digital development has resulted in unprecedented innovation and accessibility in education. But it has also posed a challenge that the students now rely more on technology than the classroom teaching. This article tries to explore the possibilities and challenges inherent in digitilisation of education and value component in digital education in India.

## Digital Age

As digital innovation is emerging in a fast track and engaging human beings, one realises the impact it has made on human life. Many studies point out to

the fact that the digital revolution has changed social relationships and the way we communicate. In some countries, mobile payment transactions are responsible for over 40 per cent of GDP. Mobile apps are used to deliver education as well as providing timely information to farmers to enhance their productivity. In some other countries digital platforms are used to access training materials from all over the world and disseminate to the participants of trainings or organisations. People also use digital tools to plan and develop products in a way that would not have been possible only a few years ago. Developing games and apps requires varied expertise, and collaboration is the key in this. The new tools for collaborative work allow those involved in this to work together and to provide virtual access to potential partners/clients to test products no matter where they are in the world.

This is otherwise referred to as the Technological Age, Information Age, Digital Age, and the Age of AI or Artificial Intelligence. Thus, this is a historic period in the 21st century characterized by the rapid shift from traditional industry that the Industrial Revolution brought through industrialization, to an economy based on information and communication technology. The digital age, also called the information age, is defined as the time period starting in the 1970s with the introduction of the personal computer with subsequent technology introduced providing the ability to transfer information freely and quickly. The rapid turnover of data is supported by the development of information and communication technology (ICT).

***Types of Digital Technologies:*** It is important at this juncture to spell out the types of digital technologies as of now. Digital technology comes in many forms because our world is now interconnected. All access to knowledge, information, and personal data can be accessed through digital technology. Here are the types of digital technology commonly used: 1) Computers, smartphones and Hardware; 2) Internet, Networks and Communication; 3) Software; 4) Online Services; 5) Information Systems and Data Processing; 6) Information Security; 7) Artificial Intelligence (AI) Technology. These are the broad spectrum under which the digital world is growing in a fast and unprecedented manner today.

Thus, the digital age refers to the use of technologies, computers, soft wares and internet, etc. to procure, preserve and present information. This has had an overall impact on all our activities, programs and policies. While, the digital age has come with many possibilities, it has also ushered in lots of challenges.

## Impact of Digital Age

It is pertinent at this juncture to observe the impact of digital age. Digital connective technologies in the 21st century have been deeply impacting all domains of life including the social, economic and the political. Such technologies of the 21st century have triggered dramatic changes in the ways people interact with content, communicate with one another and function in the society as well. Furthermore, the drastic changes are not simply restricted to increased opportunities for written, audial and video communications through highly interactive media. The opportunity to access and communicate with others located in distinct parts of the same country of residence, or even the whole world in a wider context, and the distinct new ways to interact, share and relate to the information others have shared via new media have even taken part in pressurizing key governmental processes.

Digitalization refers to the use of digital technologies in the educational process. This includes the use of online platforms for content delivery, communication between teachers and students, and assessment of learning. On the other hand, personalization of learning involves adjusting teaching and learning methods to meet the needs of each student. This may involve applying adaptive technologies that facilitate student progress at their own pace and creating educational programs that consider each student's individual interests and abilities.

In addition to increasing ways of communication, these new technologies have caused drastic changes in how people access information. Print books and encyclopaedia in the traditional sense are not the sole information holders but information is now distributed across the network of connected digital technologies that allow access anywhere anytime wherever such connections are possible. Similarly, teachers and instructors are not the sole depositories of knowledge as in the past. The digital world is emerging as one of the potential source of information and knowledge

## Higher Education and Digital Age

The National Education Policy, 2020 also points to the impact of digital age on education. Given the explosive pace of technological development allied with the sheer creativity of tech-savvy teachers and entrepreneurs including student entrepreneurs, it is certain that technology will impact education in multiple ways, only some of which can be foreseen at the present time. New technologies involving artificial intelligence, machine learning, block chains,

smart boards, handheld computing devices, adaptive computer testing for student development, and other forms of educational software and hardware will not just change what students learn in the classroom but how they learn, and thus these areas and beyond will require extensive research both on the technological as well as educational fronts.

P. Aşkar writing as early as 2013 summarized the digital advancements forcing Higher Education Institutions (HEIs) to transform and adapt to the 21st century. Among the forces for a reform in HE structures are; knowledge access and dissemination roles shifting away from HE; digital platforms bearing new interaction and affective expression schemes, new ways to express culture, its related artefacts, and values; social media effects; big data and learning analytics; massive online open courses and open educational resources; educational games and the advancement of digital platforms enabling increased interaction and collaboration between and among instructors and learners. However, it has been highlighted in the literature that the change pressures triggered by the digital connective technologies haven't found ample voice from HEIs and that they are struggling in their efforts to adopt to the digital age.

Let us at this juncture examine the interaction that is going on between the digital age and the stake holders of education.

1) ***The Learner*:** One of the fundamental elements pressurizing HEIs to change is associated with the learner. Not only is the population of learners increasing, but also the learner profiles are changing and diversifying. More and more people are searching for professional and personal development outside the classroom environment to face personal and professional life in the 21st century. Additionally, technological advancements are deeply transforming the qualifications that the workforce need to develop today and in the future such that it is estimated that around 65 per cent of the primary school children today will work in jobs that do not exist now.

2) ***The Instructor:*** The advancements in digital connective technologies in the 21st century trigger another change pressure in the roles and responsibilities of the instructors at the HE. Additionally, instructors also are required to be equipped with new sets of skills and qualifications in the digital age. The past decades when the instructor was the sole information and knowledge provider is making way for an age in which information and knowledge is distributed across digital networks accessible anytime and anywhere wherever connections

are possible. This means learners now have the opportunity to access information and knowledge not only at schools from the instructors or at libraries from printed books, but also from digital repositories, web sites, social media and online learning communities and networks.

The American Association of Colleges of Teacher Education (AACTE) and P21 published a joint report on the skills that an instructor should develop in the 21st century. Successfully aligning technologies with content and pedagogy and developing the ability to creatively use technologies to meet specific learning needs; Aligning instruction with standards, particularly those standards that embody 21st century knowledge and skills; Balancing direct instruction strategically with project-oriented teaching methods; Applying child and adolescent development knowledge to educator preparation and education policy; Using a range of assessment strategies to evaluate student performance and differentiate instruction; Participating actively in learning communities - tapping the expertise within a school environment, mentoring, knowledge-sharing, and team teaching; Acting as mentors and peer coaches with fellow educators; Using a range of strategies to reach diverse students and to create environments that support differentiated teaching and learning; Pursuing continuous learning opportunities and embracing career-long learning as a professional ethic. It is a fact that the roles and qualifications of the instructor is changing and the instructor also need to change herself or himself.

3) ***The Learning Environment.*** The current emerging understandings on how learning occurs should be addressed before dealing with how the digital innovations are shaping the learning environments and the associated changes observed in the learning environments in the digital age. We are observing a shift from the traditional learning through information acquisition models towards collaborative knowledge construction models of learning in the digital age. In this age, in line with the pedagogical shifts, informal learning plays a vital role in shaping the learning activities of the individual. For this reason, developing collective cultural practices along with both organizational and physical structures to support collaborative knowledge construction gains particular importance for educational institutions.

The pedagogical shifts triggered by the digital innovations requires the transition from one dimensional learning spaces - classroom, library, lab - to multidimensional collaborative learning spaces - physical, virtual and online-.

4) ***HEIs:*** The Australian Council for Research and Technology Development proposes that fundamentally, higher education institutions can pursue two different paths in their strategic approach to digitalization. On the one hand, digitalization can be used for modernization. In this case, existing *challenges* will be addressed by adopting digital solution strategies. On the other hand, higher education institutions can deploy digitalization to shape their institutional profile – in this case, *institutional identity* will be directly linked to digital formats.

**Possibilities and Challenges of Digitilisation of Higher Education**

Yet, the real transformation lies not in the increased and diversified ways of accessing information, rather in the increased opportunities for individuals to contribute to content production and knowledge building. Today, each and every individual has the potential to not only consume, but also produce information. The individual's production and dissemination activities play vital roles both in the academic realm and in the social concerning particularly areas of administrative processes in which the individual wishes to take part. The age we live in shows fundamental differences in how the society functions as a whole in that the world is connected through digital means in an unprecedented scale.

The European Union is of the view that digital technology is driving innovation across every aspect of life, including education. This brings opportunities in schools, colleges, universities, lifelong learning and training. However, educational technologies are not magic bullets. Just as they offer great benefits, they also create challenges, which educators need to explore and address to help shape the future of education for the benefit of all.

Digitilisation of education offers possibilities for the transformation of distance learning at the Open University if a new pedagogy for online learning is evolved. In this regard, one makes education better by implementing pedagogical change through technology in a modern institution.

But there are many challenges that need to be kept in mind. How to design a 21st-century online course that makes learning happen for all, especially for those who are left out by the digital divide in a vast country like India? Also, the implementation of pedagogical and technological innovations faces challenges such as resistance to change in pedagogical methodology, the digital skills gap between teachers and students, and insufficient technological infrastructure.

Along with the digital divide one also need to pay attention to the rural-urban divide, rich- poor, and Mother Tongue - English divides.

Further, those who are concerned about the side effect of digitalisation of education point out that the implementation of pedagogical innovations in learning is a challenge, since innovation is not only about implementing virtual tools, nor is it simply about using applications; To innovate is also to generate change, which implies taking risks to obtain new knowledge and results, and this requires clear criteria to assess and measure its impact. Innovation in higher education can also involve changes in the organizational structure of educational institutions.

One thing is certain, students will need greater self-reliance to keep focused on learning, and for this they will need support and robust, safe and reliable learning spaces. As educators one has to create these spaces, offer this support and ensure the learning content is delivered to fit this new way of learning.

Keeping these above facts in mind, development of teacher training programs need attention: Create professional development programs focused on modern pedagogy and digital didactics. These programs would include workshops, seminars, and courses that present the advantages of new methodologies, such as flipped teaching, and provide practical examples of their successful implementation. A key element would be to involve teachers in the design process of these programs to ensure their relevance and increase acceptance.

It is a fact that the degree of personalisation a teacher can provide is often limited by their capacity and pressures such as the size of the group or class, and the pressing need to get through the lesson or seminar. It is argued that in these circumstances artificial intelligence (AI) might be an effective solution. When you think about it, AI is already a regular aspect of students' everyday lives, from Alexa, through Instagram filters, to chatbots. But in a country where the vast population suffers due to digital divide, how can this be possible. This question needs to be answered first before even embarking on digitilisation of our higher education.

This concern also needs to be taken note of. Developing and applying digital education tools must never become the goal itself. It's always a mean to enhance the learning, to create better insights and to help people change their behaviour. One area where foster learning is needed is the area of sustainability, or you could say creating a more sustainable future. Science does tell us that we have not more than 10 years now to actually change the way that we use the resources

of our planet, the way that we design our transportation and energy systems, and the way that we take care of the species on our own on Earth. So in order to get there in time, we need to start thinking about how to create the knowledge, the actions that are needed.

If our educational policies, programs, pedagogies, systems and structures do not seriously and systematically work out a blend between digital growth and constitutional cum human values, then the country would produce malicks, bureaucrats and babus but not citizens who abide for, by and of the history, heritage and horizon of our country. If this is not attempted early, it would be too late to rectify our education, environment and existence.

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# Strengthening A Self-Reliant Economy Through Malaviya's Ideals and NEP 2020

## Abstract

*This research delves into the integration of Pandit Madan Mohan Malaviya's educational ideals with the objectives of India's National Education Policy 2020, focusing on promoting self-reliance in line with the nation's "Atmanirbhar Bharat" vision. As India aspires to achieve economic independence and sustainable growth, fostering self-reliance has become a crucial priority. This study explores the convergence between Malaviya's vision, which emphasizes holistic education, vocational training, inclusivity, and community involvement, and NEP 2020's strategies aimed at reforming the Indian education system to meet contemporary challenges. The study employs thematic analysis to reveal patterns that demonstrate how Malaviya's ideals can inform and enrich the ongoing educational reforms. The findings of the research underscore a strong alignment between Malaviya's holistic approach to education, which integrates vocational training, character development, and practical skills and NEP 2020's emphasis on creating skill-based, flexible learning pathways.. The research further identifies educational equity as a shared priority in both Malaviya's vision and NEP 2020, emphasizing the need for policies that ensure marginalized communities have access to quality education and skill-building opportunities. A notable finding is the critical need for continuous professional development for educators, which is essential for the successful application of both Malaviya's and NEP 2020's educational philosophies. The study provides actionable insights for policymakers, educators, and community leaders, advocating for the integration of historical educational ideals with modern reforms to foster self-reliance. It concludes with several policy recommendations, including strengthening infrastructure for vocational training, enhancing inclusivity in education, and improving teacher training programs to ensure that educators can effectively deliver a curriculum that combines academic rigor with practical skills.*

***Keywords:*** *Vocational education, holistic education, Entrepreneurship, Educational reforms, Community engagement, Skill-based learning*

## 1. Introduction:

Self-reliance has become the cornerstone of India's economic aspirations in recent years, particularly under the vision of "Atmanirbhar Bharat", introduced by Prime Minister Narendra Modi. This vision seeks to make India economically self-sufficient by reducing dependency on imports, boosting local industries, and promoting indigenous innovation. Education is one of the most critical components of this initiative, as it shapes the knowledge and skills of the nation's future workforce.

The role of education in fostering self-reliance is not a new concept in India. Pandit Madan Mohan Malaviya, a renowned freedom fighter and educationist, advocated for an educational model that emphasized character building, vocational training, and community engagement. His ideals were aimed at creating a self-reliant society where individuals could contribute meaningfully to both the economy and social well-being. Today, these ideals find resonance in the National Education Policy 2020, which proposes a comprehensive overhaul of the Indian education system to make it more inclusive, skill-oriented, and responsive to the needs of the 21st century.

This paper seeks to explore the intersection of Malaviya's educational philosophy with the NEP 2020's objectives, examining how their alignment can contribute to building a self-reliant economy. Through an analysis of both historical and contemporary educational paradigms, the paper aims to highlight the relevance of Malaviya's ideals in shaping the future of Indian education and its role in economic empowerment.

### 1.1 Background and Context

### A Pioneer of Holistic Education

Pandit Madan Mohan Malaviya was an influential figure in Indian education and politics. Born in 1861, Malaviya's contributions to India's independence movement are well-documented, but his role in transforming the country's educational landscape is perhaps even more significant. In 1916, he founded Banaras Hindu University, one of the largest residential universities in Asia, with the goal of promoting education that integrated traditional Indian knowledge with modern scientific learning.

Malaviya's educational philosophy was deeply rooted in Indian values. He believed that education should not only provide intellectual development but also foster moral and ethical character. He emphasized vocational training as a means of achieving self-reliance, advocating for an education system that equipped individuals with practical skills necessary for economic empowerment. His vision of education was one that served society at large, promoting both individual growth and national development.

In many ways, Malaviya was ahead of his time in recognizing the importance of a comprehensive educational system. He understood that a strong foundation in values and ethics was essential for building a just and prosperous society. His belief in the need for vocational training was also pioneering, as it addressed the economic needs of individuals and communities by preparing students for productive livelihoods.

**National Education Policy 2020: A Vision for a New India**

The NEP 2020, launched by the Government of India, represents a transformative shift in the country's educational framework. The policy's primary goals are to make education more inclusive, equitable, and geared towards skill development, thereby preparing students for the demands of the global economy. NEP 2020 envisions a holistic, multidisciplinary education system that balances academic learning with the acquisition of practical skills.

The policy emphasizes the need for vocational education, stating that at least 50% of learners should have exposure to vocational education by 2025. It aims to integrate vocational education into the mainstream curriculum, starting from the secondary level, to ensure that students are equipped with skills that can lead to gainful employment. NEP 2020 also highlights the importance of character building, critical thinking, and experiential learning, mirroring many of the ideals championed by Malaviya.

Moreover, the NEP 2020 stresses inclusivity, with a particular focus on marginalized communities. It aims to provide equitable access to quality education for all, regardless of socio-economic background, gender, or geographical location. This aspect of the policy aligns closely with Malaviya's vision of an education system that serves all sections of society, empowering the underprivileged and fostering social cohesion.

### 1.2 Research Problem

While both Malaviya's educational ideals and the NEP 2020 share common goals of promoting self-reliance, vocational training, and inclusivity, several challenges impede their full realization. These challenges include inadequate infrastructure, particularly in rural areas, a lack of trained teachers equipped to deliver vocational education, and cultural resistance to shifting away from the traditional focus on academic learning.

This research aims to address these challenges by exploring how Malaviya's ideals can be integrated into the NEP 2020 framework to create a more effective and inclusive education system. It also seeks to identify strategies for overcoming the barriers to implementing vocational training and promoting self-reliance in India's educational institutions.

### 1.3 Research Objectives

The primary objectives of this study are:

1. To examine the alignment between Malaviya's educational philosophy and the goals of NEP 2020.
2. To analyze the challenges in implementing vocational education and self-reliance initiatives within the current educational system.
3. To explore how vocational training can promote entrepreneurship and economic empowerment among students.
4. To provide policy recommendations for integrating Malaviya's ideals into the NEP 2020 framework.

### 1.4 Significance of the Study

The significance of this study lies in its exploration of the intersection between the educational ideals of Pandit Madan Mohan Malaviya and the National Education Policy (NEP) 2020, focusing on their potential to strengthen India's pursuit of economic self-reliance. As India aims to realize its vision of "Atmanirbhar Bharat", education plays a pivotal role in creating a skilled, innovative, and adaptable workforce. This research highlights how Malaviya's emphasis on holistic and vocational education can be harmonized with the NEP 2020's goals to produce a robust educational framework that fosters both individual and national self-reliance.

The study's importance is multifaceted:

### Educational Policy Reform

By investigating the synergies between Malaviya's ideals and the NEP 2020, the study offers critical insights that can guide policymakers in designing education systems that are more aligned with the economic and social needs of India. It highlights ways in which traditional educational values can inform contemporary policy, especially in areas such as vocational education, character development, and inclusivity.

### Economic Development

With NEP 2020's focus on skill-based learning, entrepreneurship, and industry collaboration, this study outlines how education can directly contribute to India's economic growth. Integrating Malaviya's vision of self-reliance through education with NEP 2020 offers a comprehensive model for producing a workforce that is equipped with both technical skills and ethical values, essential for driving sustainable economic development.

### Social Equity and Inclusion

Both Malaviya and NEP 2020 emphasize the need for inclusive education, particularly for marginalized communities. This research underscores the importance of creating equitable access to quality education, which can empower underserved populations and contribute to bridging socioeconomic disparities. Such inclusivity is crucial for achieving a more just and self-reliant society.

### Vocational Training and Workforce Development

The study stresses the critical role of vocational education, a key component in both Malaviya's philosophy and NEP 2020. It shows how vocational training can not only equip students with practical skills but also instill a sense of dignity in labor, thereby fostering a more diverse and capable workforce.

### Global Relevance

As economies around the world seek to become more self-sustaining in the face of global challenges, this study offers a valuable case of how education systems can be restructured to support self-reliance. The findings have implications for international education policy, especially in developing nations looking to balance traditional educational philosophies with modern economic demands.

## 2. Literature Review:

The research on Strengthening a Self-Reliant Economy through Malaviya's Ideals and NEP 2020 draws on a diverse body of literature, exploring the intersection of historical educational philosophy and contemporary policy goals. This review will examine key themes, including the role of vocational education, entrepreneurship, self-reliance, and the challenges of implementing educational reforms within the framework of Malaviya's ideals and the National Education Policy 2020.

Pandit Madan Mohan Malaviya's contributions to Indian education, particularly his vision of integrating holistic and vocational education, have been a significant focus in historical and educational studies. Malaviya was a strong advocate for a value-based education that would equip students with both academic and practical skills, fostering self-reliance and nation-building. According to Ghosh (2015), Malaviya believed in an education system that emphasized character building, moral values, and service to the nation, a concept closely tied to his idea of creating a self-reliant India. His legacy as the founder of Banaras Hindu University reflects his commitment to integrating traditional values with modern education, a vision that remains relevant today (Mishra, 2019).

Sinha (2020) highlights the modern relevance of Malaviya's educational philosophy, noting that his emphasis on inclusivity and community engagement aligns with contemporary educational goals of equity and accessibility. Malaviya's ideas of vocational training as a pathway to economic empowerment are increasingly important in today's context, especially in relation to NEP 2020's goals of skill-based learning and self-reliance. This philosophical foundation continues to inspire debates on the role of education in fostering economic independence.

The NEP 2020 has been hailed as a landmark reform in Indian education, aiming to overhaul the current system by promoting critical thinking, flexibility, and a stronger focus on vocational and skill-based education. Kumar (2021) discusses how NEP 2020 emphasizes the need to align education with the demands of the 21st-century economy, specifically through the promotion of entrepreneurial thinking and vocational skills. The policy's push for vocational education, entrepreneurship, and self-reliance echoes Malaviya's ideals of an education system that not only provides knowledge but also prepares individuals to contribute to the nation's economic growth.

Sharma (2021) points out that the NEP 2020's framework for vocational education is designed to make students employable and entrepreneurial, thus contributing to India's "Atmanirbhar Bharat" (self-reliant India) mission. However, challenges persist in its implementation, particularly in rural areas where access to vocational training and adequate infrastructure is limited (Rani & Rani, 2021). Gupta (2019) further explores these challenges, highlighting the issues of teacher training, resource allocation, and the socio-cultural stigmas attached to vocational education, which need to be addressed to fully realize the potential of NEP 2020.

The integration of entrepreneurship into education is another critical theme in the literature. Fayolle and Gailly (2015) argue that entrepreneurship education has a significant impact on students' entrepreneurial intentions, especially when integrated into higher education curricula. NEP 2020's focus on entrepreneurship aligns with this notion, as it aims to equip students with the skills and mindset necessary to start their own ventures, thereby contributing to economic self-reliance.

Jones and Iredale (2010) further emphasize that entrepreneurship education is not just about teaching students how to start businesses, but also about fostering a culture of innovation and problem-solving. This aligns with the broader goals of NEP 2020, which seeks to move away from rote learning and promote creativity and critical thinking (Chauhan, 2020). By integrating entrepreneurial education with vocational training, NEP 2020 aims to create a generation of self-reliant individuals capable of contributing to India's economic growth.

While NEP 2020 presents an ambitious framework for reform, its successful implementation faces several obstacles. Rani and Rani (2021) conducted an empirical analysis of NEP 2020's challenges, identifying inadequate infrastructure, teacher preparedness, and regional disparities as significant barriers. These issues are particularly pronounced in rural areas, where access to quality education and vocational training remains limited (Gupta, 2019).

Sengupta (2020) also discusses the challenge of bridging the educational divide between urban and rural areas, a key concern for the successful implementation of NEP 2020. Malaviya's ideals of inclusivity and equitable access to education are critical in this context, as the policy must address the needs of marginalized and underserved communities to foster true self-reliance. The need for robust

teacher training programs and infrastructure development is echoed by Sharma (2021), who emphasizes that without addressing these foundational issues, the potential of vocational education to promote economic independence will remain unrealized.

In terms of policy integration, NEP 2020 offers a framework that can potentially align with Malaviya's vision of holistic and practical education. However, as Singh (2020) notes, the policy must be adapted to local contexts, particularly in terms of vocational education and entrepreneurship. Malaviya's ideals provide a strong philosophical foundation for these efforts, but the policy's success will depend on how effectively it can be integrated into the diverse educational landscape of India.

## 3. Methodology:

### 3.1 Research Design

This study adopts a qualitative research design to explore the alignment between Malaviya's educational ideals and the National Education Policy (NEP) 2020, and to investigate how these can together contribute to building a self-reliant economy. A qualitative approach allows for an in-depth understanding of educators' perspectives and the challenges faced in implementing vocational education and skill-based learning.

### 3.2 Data Collection

**Primary Data:**

**Semi-structured interviews**

A total of 150 semi-structured interviews were conducted with educators, policymakers, administrators, and students from various educational institutions across Tamil Nadu. These interviews were carried out through a mix of online platforms and in-person meetings, depending on participants' availability and geographic location. The interviews focused on gathering their perspectives on the relevance of Malaviya's educational philosophy in today's context, the challenges faced in implementing NEP 2020, and the potential of vocational education to foster self-reliance and economic empowerment. Participants were selected to ensure diversity, including representation from urban and rural areas, mainstream education, and vocational streams.

**Focus group discussions**

Focus group discussions were held with 10 groups, involving both students and teachers from schools, colleges, and vocational training centers. These discussions, conducted online and in person, took place across different regions of Tamil Nadu to reflect the experiences of participants from various educational and socioeconomic backgrounds. The focus groups provided in-depth insights into their experiences with vocational education under the NEP 2020, shedding light on how effectively the new policy framework is being implemented and the challenges encountered along the way.

**Secondary Data:**

A comprehensive review of existing literature, policy documents, government reports, and case studies related to Malaviya's educational ideals, vocational education, and NEP 2020 was conducted. This helped in contextualizing the primary data and drawing comparisons between past and present educational frameworks.

### 3.3 Sampling

The participants in the study were selected using purposive sampling to ensure a comprehensive representation of diverse perspectives across various regions of Tamil Nadu. A total of 150 participants were included, comprising educators, policymakers, and students. This sample was carefully distributed to include 50 educators from both urban and rural areas, representing districts such as Chennai, Coimbatore, Madurai, and Thanjavur, as well as more remote regions in order to account for regional differences in educational access and practices.

The study also included 25 policymakers involved in the formulation and implementation of NEP 2020, providing critical insights into the policy's objectives, challenges, and practical implications. Additionally, 75 students were selected, representing an equal number from mainstream education and vocational education streams (37 students each). These students came from a diverse range of educational institutions, including schools, vocational training centers, and universities, offering a wide array of experiences and perspectives on how education contributes to self-reliance and economic empowerment.

### 3.4 Research Questions

1. How do Malaviya's educational ideals align with the objectives of NEP 2020 in promoting self-reliance?

2. What are the key challenges in implementing vocational education and skill-based learning in India under NEP 2020?
3. How can the integration of vocational education foster entrepreneurship and economic empowerment among students?
4. What strategies can be employed to ensure that Malaviya's vision of holistic, inclusive education is reflected in the NEP 2020's implementation?

## 4. Data Analysis:

Thematic analysis was used to analyze the qualitative data from interviews and focus group discussions. Key themes were identified based on the research objectives, such as alignment between Malaviya's ideals and NEP 2020, challenges in implementing vocational education, and strategies for promoting self-reliance through education. The data was then coded and categorized under these themes to draw conclusions and make policy recommendations.

## 5. Limitations

While this study provides valuable insights, it has some limitations. The sample size was relatively small, which may not capture the full diversity of perspectives across India's vast and varied education system. Additionally, since the NEP 2020 is still in the early stages of implementation, the long-term impacts of its policies could not be fully assessed at this stage.

## 6. Findings and Discussion:

### Alignment of Malaviya's Ideals with NEP 2020

The findings of this research reveal a strong alignment between Malaviya's educational philosophy and the objectives of NEP 2020. Both emphasize holistic education, character building, and the integration of vocational training as essential components of a well-rounded education. Malaviya's belief that education should empower individuals to contribute to society and the economy is mirrored in NEP 2020's focus on skill-based learning and entrepreneurship.

### Holistic Education and Character Building

Malaviya believed that education should not only impart academic knowledge but also build moral character and social responsibility. He emphasized that students should be prepared to face real-world challenges with integrity and ethical values. NEP 2020 echoes this sentiment by calling for an education

system that develops critical thinking, creativity, communication, and ethical decision-making skills among students.

Participants in the study, especially educators, noted that the NEP 2020's emphasis on holistic development is a step in the right direction. However, they pointed out that there needs to be more practical guidance on how to integrate character education into the curriculum. Malaviya's ideals of moral education can provide a useful framework for schools looking to implement these changes.

**Vocational Education and Self-Reliance**

Malaviya was a staunch advocate for vocational education, seeing it as a way for individuals to become economically self-sufficient. Similarly, NEP 2020 places significant emphasis on the integration of vocational training into mainstream education, aiming to expose at least 50% of students to vocational courses by 2025. Both Malaviya and the NEP highlight the need for skill development to promote self-reliance and reduce unemployment.

The study found widespread support for vocational education among policymakers and educators, who believe that it can help bridge the gap between education and employability. However, participants also expressed concerns about the quality of vocational training in many institutions, particularly in rural areas. There is a need for better infrastructure, more trained teachers, and partnerships with industry to ensure that students receive high-quality vocational education that prepares them for the job market.

**Challenges in Implementing Vocational Education**

While the NEP 2020's focus on vocational education is commendable, the study identified several challenges in its implementation, many of which were echoed in Malaviya's time as well.

**Infrastructure and Resources**

One of the key challenges in implementing vocational education is the lack of adequate infrastructure and resources, particularly in rural and remote areas. Many schools and colleges do not have the necessary equipment, workshops, or facilities to provide hands-on vocational training. Without these resources, it is difficult for students to acquire practical skills that are relevant to the modern job market.

## Cultural Attitudes and Academic Bias

Another challenge is the cultural bias against vocational education, which has historically been viewed as inferior to academic education in India. Many parents, students, and even educators still prioritize traditional academic streams such as engineering or medicine, seeing vocational courses as a fallback option for those who are unable to succeed in mainstream education.

This bias against vocational education is a significant barrier to its widespread adoption. Malaviya faced similar challenges during his time, as vocational training was often dismissed as less prestigious. However, he believed that vocational skills were essential for building a self-reliant society and argued that they should be valued on par with academic achievements. NEP 2020 attempts to address this issue by integrating vocational education into the mainstream curriculum, but changing cultural attitudes will require a concerted effort from educators, policymakers, and society at large.

## Inclusivity and Access

NEP 2020 emphasizes inclusivity, particularly for marginalized communities. Malaviya's vision of education for all, regardless of socio-economic background, aligns with this goal. However, the study found that achieving true inclusivity remains a challenge, especially in rural areas where access to quality education is limited.

Students from marginalized communities often lack the financial resources, technological access, or social support needed to fully benefit from educational reforms. The gap between urban and rural education remains wide, and without targeted interventions, the most disadvantaged students may continue to be left behind. Both Malaviya and the NEP 2020 advocate for educational equity, but achieving this goal will require significant investment in rural education infrastructure and targeted policies to support underprivileged students.

## Strategies for Enhancing Self-Reliance through Education

Based on the findings, several strategies can be employed to enhance the role of education in fostering self-reliance and economic empowerment.

## Strengthening Vocational Education Infrastructure

Improving the quality of vocational education requires significant investment in infrastructure. Schools and colleges need access to state-of-the-art workshops,

equipment, and tools that allow students to gain hands-on experience. This can be achieved through partnerships with industries and private sector organizations, which can provide resources, expertise, and opportunities for internships and apprenticeships.

**Teacher Training and Professional Development**

Teachers play a crucial role in delivering high-quality education, and this is particularly true for vocational education. The government should invest in continuous professional development programs that equip teachers with the skills and knowledge they need to effectively teach vocational subjects. This could include training in new technologies, pedagogical techniques, and industry-specific skills.

**The Role of Vocational Education in Economic Empowerment**

One of the most significant aspects of both Malaviya's ideals and the NEP 2020 is the emphasis on vocational education as a means of fostering economic self-reliance. Vocational education provides students with practical skills that are directly applicable to the job market, enabling them to either secure employment or start their own businesses. This focus on vocational training is particularly relevant in today's global economy, where automation and technological advances are reshaping the labour market and increasing the demand for specialized skills.

**Empowering Marginalized Communities**

Vocational education has the potential to be a powerful tool for uplifting marginalized communities, many of whom have historically been excluded from mainstream educational and economic opportunities. For instance, students from economically disadvantaged backgrounds or rural areas often face barriers to accessing higher education due to financial constraints or lack of infrastructure. By providing these students with vocational training, the education system can equip them with marketable skills that allow them to earn a livelihood and break the cycle of poverty.

In this context, Malaviya's vision of education as a tool for social upliftment and national development resonates deeply with NEP 2020's commitment to inclusivity. Both frameworks recognize that economic empowerment must be accessible to all sections of society, not just the privileged few. As such, promoting vocational education in marginalized communities can play a vital

role in creating a more equitable society where everyone has the opportunity to contribute to the country's economic growth.

**Linking Vocational Education with Industry**

Another key finding of the study is the importance of linking vocational education with industry. Many of the participants noted that vocational training programs need to be closely aligned with the needs of the job market to ensure that students acquire skills that are in demand. This requires greater collaboration between educational institutions and industries, with the latter playing an active role in curriculum development, internships, and apprenticeships.

Malaviya's emphasis on practical, hands-on education is highly relevant in this regard. His vision of vocational training was not limited to the acquisition of technical skills but also included real-world experience and engagement with industry. Similarly, NEP 2020 advocates for experiential learning and partnerships with industries to provide students with opportunities for internships and apprenticeships. These partnerships can bridge the gap between education and employment, ensuring that vocational education produces graduates who are job-ready.

**Entrepreneurial Education: Creating Job Creators, Not Job Seekers**

Another critical aspect of vocational education, as envisioned by both Malaviya and the NEP 2020, is its potential to foster entrepreneurship. In a rapidly changing global economy, where traditional job roles are being disrupted by technology and innovation, the ability to think creatively and start new ventures is increasingly important. Entrepreneurship not only provides individuals with an alternative to traditional employment but also drives economic growth by creating new jobs and industries.

Malaviya believed that education should empower individuals to become self-reliant and contribute to the nation's development. In today's context, this translates into an emphasis on entrepreneurial education, where students are encouraged to think innovatively and develop the skills needed to start their own businesses. NEP 2020 recognizes this need and advocates for entrepreneurship training as part of the broader push for vocational education.

Entrepreneurial education equips students with critical skills such as problem-solving, financial literacy, risk management, and leadership. By incorporating

entrepreneurship into vocational training programs, the education system can create a new generation of job creators who are capable of driving India's economic growth and reducing unemployment.

## Overcoming Cultural and Institutional Barriers

While the NEP 2020 presents a promising vision for the future of education in India, significant challenges remain in its implementation. One of the most pervasive barriers is the cultural attitude towards vocational education, which is often viewed as a less prestigious option compared to academic pathways. This bias is deeply ingrained in Indian society, where professions like engineering, medicine, and law are traditionally seen as more desirable career choices.

## Changing Perceptions

Malaviya faced similar challenges in his time, as vocational education was often seen as inferior to academic education. However, he recognized that vocational training was essential for the economic empowerment of individuals and the development of the nation. He argued that vocational education should be valued equally to academic education, as both play a vital role in building a self-reliant society.

Changing these cultural perceptions requires a concerted effort from educators, policymakers, and the media. Public awareness campaigns can play a crucial role in shifting societal attitudes towards vocational education by highlighting the success stories of individuals who have built successful careers through vocational training. Schools and colleges can also contribute by offering vocational courses that are integrated into mainstream education and treated as equally prestigious.

## Institutional Support and Policy Interventions

Another challenge in implementing NEP 2020 is the lack of institutional support for vocational education. Many schools and colleges do not have the infrastructure, resources, or trained staff to provide high-quality vocational training. This issue is particularly acute in rural areas, where educational institutions often lack the basic facilities needed for hands-on training.

Addressing these challenges requires significant investment in the education sector, particularly in rural and underdeveloped areas. The government must

prioritize the development of vocational training centres, workshops, and laboratories that provide students with access to the tools and equipment they need to acquire practical skills. In addition, teacher training programs must be expanded to ensure that educators are equipped with the skills and knowledge needed to deliver vocational education effectively.

## 7. Policy Recommendations:

Based on the findings of this research, several policy recommendations are proposed to strengthen the alignment between Malaviya's ideals and NEP 2020 and to promote a self-reliant economy through education:

### Integration of Vocational Education into Mainstream Curriculum

To overcome the stigma associated with vocational education, it should be fully integrated into the mainstream curriculum. Schools and colleges should offer a combination of academic and vocational courses, allowing students to choose pathways that align with their interests and career goals. This will help elevate the status of vocational education and make it a more attractive option for students.

### Enhancement of Teacher Training Programs

Teacher training programs should be expanded to ensure that educators are well-prepared to deliver vocational education. This includes not only technical training but also professional development in areas such as entrepreneurship, experiential learning, and industry engagement.

### Public-Private Partnerships

The government should promote partnerships between educational institutions and industries to provide students with access to internships, apprenticeships, and real-world experience. Industries should be actively involved in curriculum development to ensure that vocational education is aligned with the needs of the job market.

### Entrepreneurship Education

Schools and colleges should incorporate entrepreneurship training into their vocational education programs. This will equip students with the skills needed to start their own businesses and contribute to job creation in the economy.

Entrepreneurial education should include mentorship programs, where experienced business leaders provide guidance and support to aspiring entrepreneurs.

**Financial Support for Marginalized Communities**

To ensure that vocational education is accessible to all students, particularly those from marginalized communities, the government should provide financial support in the form of scholarships, grants, and loans. Special attention should be given to rural areas, where students often face barriers to accessing quality education.

**Public Awareness Campaigns**

Changing societal attitudes towards vocational education requires a cultural shift. Public awareness campaigns, led by both the government and civil society, should promote the value of vocational education and highlight its role in fostering self-reliance and economic empowerment.

## 8. Conclusion:

Pandit Madan Mohan Malaviya's ideals of holistic education, vocational training, and inclusivity continue to be highly relevant in the modern context, particularly in light of the National Education Policy (NEP) 2020. Both Malaviya's vision and the NEP 2020 share a common goal of fostering self-reliance by equipping individuals with the skills, knowledge, and values needed to contribute to the nation's economic development.

The alignment between Malaviya's educational philosophy and the NEP 2020 presents a unique opportunity to build a more inclusive and self-reliant education system in India. However, significant challenges remain, particularly in terms of infrastructure, teacher training, cultural attitudes, and inclusivity. Addressing these challenges requires a coordinated effort from policymakers, educators, and industry stakeholders.By drawing on Malaviya's timeless ideals and the forward-thinking vision of NEP 2020, India has the potential to create an education system that not only prepares students for the demands of the 21st-century economy but also fosters social cohesion and national development. With the right policies and investments, India can build a self-reliant, empowered, and inclusive society where education is the cornerstone of economic growth and prosperity.

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**4**

# Educational Aspirations of University Girl Students: A Study of Lucknow

**Abstract**

*Educational aspirations of women or girls begin to shape up as they enter into their university education. During university education they need support to explore varied opportunities to develop talents and skills. The Indian constitution recognizes that education to all citizens is a constitutional right. There are many policies implemented by the state and central governments on women empowerment, gender disparity, and equality to women, particularly in education. The present study is based on the educational aspirations of the girl students. The study was conducted at Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow, Uttar Pradesh, India. The study involves a total of 88 students of undergraduate and postgraduate students. A set of questionnaires were prepared to get the responses of the girl students of the university. A Google Meet link was created by the researcher. All the girl students were invited to the Google Meet link. After joining the Google Meet link, the researcher briefed them about the questions, and then a Google Form was provided to them with appropriate questions about educational aspirations. All the girl students attempted the questions and responses were collected.*

***Keywords:*** *Education, Girl, Postgraduate, Students, Undergraduate, University.*

## Introduction

India is a developing economy and is considered one of the largest democracies in the world. It is expanding in many areas of development, which is vital to the growth of the nation. Along with economic and infrastructural development, there is also a need for social development. During the time of independence, the female literacy rate was a mere 8.6 percent. Though it has seen a rise,

India has not met the world's average female literacy rate. Educational aspirations of women or girls address a strong desire to achieve something high or great in society. Therefore, educational aspirations are a dream, which every girl student wants to achieve after completing their education. The different national educational policies and commissions give high priority to gender equality and these have led the entire education system to work for the upliftment of women. Educated women are always given better social status and respect from family members and peers.

In the study it is seen that higher education for girls helps them fulfil their full potential and achieve success in their careers. Obtaining the highest or higher education allows female students to better grasp the level of education, which may benefit their future. In earlier studies it was seen that girls have higher educational aspirations than boys. Boys feel more rejected with the atmosphere at home in comparison to girls who experienced more nurturance than boys (Goel 2004). There were insignificant gender differences in educational aspirations between senior level high school students (Dai 1996). Family influences shaped students' educational goals by influencing attitudes, extracurricular activities, reading for homework, school, and students' impressions of their parents' educational aspirations (Garg et al. 2002). Changing roles for women worldwide have placed young adult women in a bind, caught between the customary role of wife and mother and newer aspirations for higher education and careers (James-Hawkins et al. 2016). In Gulf countries, such as Qatar, gender norms about women's roles as wives and mothers may have a particularly strong influence on their aspirations (Liloia 2019). Despite strong gendered familial expectations for women to marry and bear children, competing influences place pressure on women to contribute to the nation-state (Moghadam 2004). The concept of aspiration is highly connected to human intelligence levels. In the modern era whole world focuses on quality education because education is the key to success in modern times, so the study of the educational aspirations of female students is more relevant and important.

## Literature Review

Gupta (2015) in her book, 'Status of Tribal Women in Tripura' says that women play a central role in the pastoral way of life, providing labour for the livestock, land and household. In many societies, women are responsible for managing and processing small stock and other animals kept at the homestead. They are the backbone of the pastoral economic structure in Tripura, a state

of substantial participation and contribution to the pastoral economy with respect to the role of women in India, as the production system is much dependent on them. In spite of Tripura's livestock, production has not been paid enough attention. The status of the pastoral tribal women of Tripura has not remained static over time and is undergoing rapid changes at present. When primary and secondary subsistence activities are counted, women work more than men. Status of women varies in different societies. Despite several economic, political and social changes, women are still far behind (Bhasin 2017).

In tribal communities of Odisha women have their unique status and much more empowered than non-tribal women due to their significant role in social, religious, political, cultural and economic field in their family as well as in village or community level. The women in the tribal society constitute about half of the tribal population. Their role in the tribal society is very important, because the tribal women work harder and the entire family economy and management depends on them. The tribal women were better placed in many respects and more empowered in certain areas (Mohapatra 2017).

Study of the Socio-economic Roots of Gender Violence in Odisha points out that violence against the vulnerable sections of the society arising due to multitude factors in the era of globalization is a serious matter of social and academic discourse. The growing incidence of violence perpetrated against women in contemporary times is a testimony to the fast-eroding idea of human security in a globalized world, which originates from the patriarchal power structure existing in the society (Dhal 2018).

Families with higher incomes and higher social status have favourable opinions about education and teaching their girls. Lack of a suitable school atmosphere, need-based curricula, female teachers, and financial difficulties are the main causes of the unfavourable opinions held by the majority of families. However, the government's primary worry is the acute lack of physical infrastructure and human resources for girls' education. Providing new school locations, guaranteeing the availability of school buildings and associated infrastructure, and offering various fellowships and scholarships for underprivileged students are some ways to address the issues in girl education (Puhan et al. 2013). It is very much essential for students to have high educational aspirations as it is only education that opens up new opportunities for employment, provides more security and changes their standard of living (Hembram and Rout 2024).

## Objectives

The objectives of this study are:

1. To know the educational aspirations of the undergraduate and postgraduate girl students.
2. To identify the factors influencing the girl students to achieve their aspirations.

## Methodology

The study has been conducted using a quantitative research method. For the data collection the researcher has applied the survey method. A self-made questionnaire was prepared by the researcher. The questionnaire was supplied to all the students through Google Forms by conducting an online survey. To check the reliability and validity of the items, a pilot study was conducted before the survey. The total number of girl students was 88 of whom samples were taken, out of which 52 were studying for a Master's degree (PG) and 36 for a Bachelor's degree (UG). The sample of the study consists of undergraduate and postgraduate girl students of Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow, Uttar Pradesh, India, by using simple random sampling technique.

## Data Analysis

### *Objective 1: To Know the Educational Aspirations of the Undergraduate and Postgraduate Girl Students*

A total of 88 students participated in the survey, of which 52 (59.1%) were from Master's degree and 36 (40.9%) were from Bachelor's degree.

Table 1 shows the profession or jobs which most of the girl students want to become. Every student of today has some dreams to become some important person in society, so that they can serve the people with great enthusiasm and zeal. They focus on their studies to achieve a high status with their graduating class. It is found that a maximum of 59.1 percent of the girl students want to become a teacher, 22.7 percent of the girl students want to choose some other profession, that is, they are not sure of and other few want to become engineer, doctors, scientists and self-employed. Therefore, it can be seen that today still girl students prefer to become a teacher, which is a very attractive profession for them.

**Question - What do you want to become?**

Table 1

| *Variables* | *Frequency* | *Percentage* |
|---|---|---|
| Air hostess | 1 | 1.1 |
| Engineer | 2 | 2.3 |
| Manager | 2 | 2.3 |
| Scientist | 4 | 4.5 |
| Self-employed | 3 | 3.4 |
| Social worker | 4 | 4.5 |
| Teacher | 52 | 59.1 |
| Other | 20 | 22.7 |
| Total | 88 | 100.0 |

Table 2 shows the choice of subject in their Under Graduate studies. Choosing a subject can provide a sense of direction for the girl students in their education and career. Interest in any subject helps to define what girl students want to achieve and allows them to identify the steps to reach their destination. It is seen that a maximum of 71.6 percent of the girl students choose their subject, which is their personal choice. Similarly, one sees that an equal percentage (11.4%) of the girl students responded that their parents or their siblings helped to choose a particular subject in their undergraduate course, and minimal girl students responded that their teachers or friends helped in choosing a particular subject in their undergraduate course.

**Table 2: Who helped you to choose a particular subject in undergraduate?**

| *Variables* | *Frequency* | *Percentage* |
|---|---|---|
| Siblings | 10 | 11.4 |
| Friends | 1 | 1.1 |
| Own choice | 63 | 71.6 |
| Parents | 10 | 11.4 |
| Teachers | 4 | 4.5 |
| Total | 88 | 100.0 |

Table 3 depicts the relationship of interest in the aspiration of getting higher education. Higher education for girls helps to realize their true potential and achievement in their career. Getting the highest or a higher education helps girl students to understand better the level of education, which may help them for their better future. It shows that around 44.3 percent of girl students say that it is only by proper education, they can go a long way in life, around 25 percent of girl students responded that in a democratic country everyone has a right for education, around 21.6 percent of girl students responded that they can command more respect and recognition by the people due to their highest education, and around 8 percent of girl students responded that without properly being educated, people may take undue advantage of them. Therefore, one can say that higher education for girl students helps them to think in new ways and overcome the hurdles they face in their daily life.

**Table 3 – What are the reasons for choosing the highest education of interest as your aspiration?**

| ***Dimensions*** | ***Frequency*** | ***Percentage*** |
|---|---|---|
| I can command more respect and recognition by the people due to my highest education. | 19 | 21.6 |
| In a democratic country everyone has a right for education. | 22 | 25.0 |
| Only by proper education, I can go a long way in life. | 39 | 44.3 |
| Without properly being educated, people may take undue advantage of me. | 7 | 8.0 |
| Other | 1 | 1.1 |
| Total | 88 | 100.0 |

Table 4 shows the wish of girl students in continuing their studies till level of education. Aspiration is an abstract word or value and beliefs regarding future plans, what a person wants to achieve whether in education or in a profession. Here the wish taken by a girl student reflects about her educational achievement till which educational level she wishes to achieve.

**Table 4 – When do you wish to continue your studies until?**

| *Variables* | *Frequency* | *Percentage* |
|---|---|---|
| Undergraduate | 1 | 1.1 |
| Ph.D. | 38 | 43.2 |
| Postgraduate | 16 | 18.2 |
| Post Doctorate | 1 | 1.1 |
| Professional Training (in own choice of profession) | 32 | 36.4 |
| Total | 88 | 100.0 |

It is found that around 43.2 percent of girl students responded that they would like to study till PhD, around 36.4 percent of girl students responded that after completing their undergraduate or postgraduate they should go for professional training related to their respective subjects, and around 18.2 percent of girl students responded that they would like to study till post-graduation. Therefore, one can see that girl students have higher educational aspirations.

***Objective 2: To Identify the Factors Influencing the Girl Students to Achieve their Aspirations***

**Table 5 – Who encourages you to achieve your goal?**

| *Dimensions* | *Frequency* | *Percentage* |
|---|---|---|
| Siblings | 4 | 4.5 |
| Friends | 1 | 1.1 |
| Parents | 30 | 34.1 |
| Self | 44 | 50.0 |
| Teachers | 9 | 10.2 |
| Total | 88 | 100.0 |

Table 5 shows the encouragement received from the different people to achieve their goals. To encourage or motivate the girl students towards their goal can help them avoid loss of time or spending excessive on education and it may lead them towards one specific and achievable goal. It shows that 50 percent of girl students responded that they are self-motivated towards their goal, whereas 34.1 percent of girl students responded that it is their parents who encourage them to achieve their goals, and similarly 10.2 percent of the girl students responded that their teachers encourage them in achieving their goals. Therefore, one can see that today's girl students are more conscious about their education and career.

**Table 6 – What are the factors that influence you towards a particular job or profession?**

| *Factors* | *Frequency* | *Percentage* |
|---|---|---|
| Attracted towards a particular job or profession | 12 | 13.6 |
| To become self-reliant | 41 | 46.6 |
| To follow your role model | 3 | 3.3 |
| To have better life | 14 | 15.9 |
| To help others | 18 | 20.5 |
| Total | 88 | 100.0 |

Table 6 shows the factors influencing girl students towards a particular job or profession. There are millions of girl students around the world being denied an education because of discrimination, poverty and due to other social and cultural phenomena. Still, they want to learn, fulfill their dreams, work and help their families and communities. It shows that 46.6 percent of girl students believe that doing any job or profession makes them self-reliant. Similarly, 20.5 percent of girl students think that doing any job or profession will make them capable of helping others. Again, one can see that 15.9 percent of girl students think that doing any job or profession will lead to a better life. Therefore, one can see that the maximum number of girl students want to be educated, to become self-reliant, to have a better life and to help others.

**Table 7 – I would like to pay more attention to my studies because…**

| *Dimensions* | *Frequency* | *Percentage* |
|---|---|---|
| I am very particular about my studies | 21 | 23.9 |
| I can reach my goal fully by attaining a good education | 54 | 61.4 |
| I would like to complete my education without any loss of time | 12 | 13.6 |
| Other | 1 | 1.1 |
| Total | 88 | 100.0 |

Table 7 explains the ideas that girl students give attention to their studies. India's country's economic and social conditions are very much dependent on girl education. Today, an educated girl or woman can result in a decrease of social evils, for example, corruption, dowry, domestic violence, child marriage, etc. Thus, one can see how one educated girl or woman can bring so much change to her life and the lives of others. It is found that girl students give attention to their studies. It shows that 61.4 percent of girl students responded that they pay more attention to their studies because education can only help them to reach their goals. 23.9 percent of girl students responded that they are very particular about their studies. Similarly, 13.6 percent of girl students responded that they completed their education without wasting any time. Therefore, one can see that most of the girl students have a special desire to complete their higher education.

Table 8 focuses on the value of education for a girl child. Performance of girls in class 10 and class 12 board examinations, 2022 of different boards of India is very remarkable, even in the UPSC, and the 2022 result shows that all first, second, third and fourth rankers are girls. Therefore, over the past couple of years, girls have surpassed boys in their final examination and in competitive examinations. It is found that 60.2 percent of girl students responded that the education they are getting seems to be essential to them because it enables them to expand themselves in the world of knowledge. Again, around 21.6 percent of girl students responded that the education they are getting seems to be helpful in getting a job, and around 11.4 percent of girl students responded that the education they are getting seems to be meaningful to them because it enables them to secure a high status. Therefore, one can see that girl students have many good expectations from education.

**Table 8 – What I expect from the education I am getting seems to be…**

| *Dimensions* | *Frequency* | *Percentage* |
|---|---|---|
| Essential as it provides minimum knowledge of various values. | 5 | 5.7 |
| Essential to me because it enables me to expand myself in the world of knowledge. | 53 | 60.2 |
| Helpful to get the job. | 19 | 21.6 |
| Meaningful to me because it enables me to secure a high status. | 10 | 11.4 |
| Other | 1 | 1.1 |
| Total | 88 | 100.0 |

Table 9 reveals that girl students of UG/PG are more focused on their study and more conscious towards their profession. Time spent every day on studying can help the girl students to maintain consistency. This can further improve their performance and help them to achieve their desired goals. It is found that girl students of undergraduate and postgraduate are more focused on their studies and more conscious towards their profession. According to the study conducted, 75 percent of girl students spend more than two hours of study every day, while 9.1 percent spend a minimum of two hours of time every day. Studying for some time everyday helps them to acquire new information and knowledge. Additionally, it helps the girl students to combat the pressure of last minute preparation, which can hinder their performance. Therefore, one can see that being regular with studies helps the girl students to increase their performance and develop their confidence. It is also found that there is a keen interest of parents in their girl children's education.

**Table 9: How much time do you spend every day studying?**

| *Variables* | *Frequency* | *Percentage* |
|---|---|---|
| Less than one hour | 5 | 5.2 |
| More than two hours | 66 | 75.0 |
| Not able to give any time | 4 | 4.5 |
| One hour | 5 | 5.7 |
| Two hours | 8 | 9.1 |
| Total | 88 | 100.0 |

Table 10 reveals about the attraction towards a particular profession of a girl child. Choosing a career marks a determinant moment in the life of girl students. To choose any profession or attraction towards any profession depends on a series of intrinsic and extrinsic factors that relate to one another in different ways. As the survey reveals that out of 88 respondents, 59.1 percent or more than 50 percent of girl students want to become teachers or want to join the teaching profession. It is found that 77.3 percent of girl students say that they like that profession very much. Similarly, 12.5 percent of girl students say that their parents encourage them towards that profession, whereas one can see that very few percentage of girl students respond that it is their teacher or siblings or friends that encourage them towards choosing their career.

**Table 10: Why are you attracted towards a particular profession?**

| ***Dimensions*** | ***Frequency*** | ***Percentage*** |
|---|---|---|
| I like that profession very much | 68 | 77.3 |
| My brothers and sisters encourage me | 2 | 2.3 |
| My parents encourage towards that profession | 11 | 12.5 |
| My teachers encourage me | 3 | 3.4 |
| My friends encourage me | 4 | 4.5 |
| Total | 88 | 100.0 |

Table 11 focuses on the feeling of the girl child towards higher education. The last survey of All India Survey on Higher Education report shows that there is 49 percent share in total enrollment of women in higher education. Today, one can find that girl students from all sections of society have entered the realm of higher education with full gusto. It is found that 50 percent of girl students responded that going for higher studies is a value for them because they cannot achieve whatever they want in the society without education, and again 28.4 percent of girl students responded that going for higher studies is a value for them because they have seen many educated people well settled in life and 13.6 percent of girl students responded that going for higher studies is a value for them because they have realized that there are big differences in educated and uneducated people.

**Table 11 – I feel that going for higher studies is essential for me because…**

| *Dimensions* | *Frequency* | *Percentage* |
|---|---|---|
| From the material point of view also it is needed. | 6 | 6.8 |
| I cannot achieve whatever I want in society without education. | 44 | 50.0 |
| I have seen many educated people well settled in life. | 25 | 28.4 |
| There is a difference between educated and uneducated persons. | 12 | 13.6 |
| Other | 1 | 1.1 |
| Total | 88 | 100.0 |

Table 12 shows that 39.8 percent of girl students responded that their feeling about education is a stepping stone for a successful life and it helps for progressive life. There is a saying that if you educate a boy, you educate one person, when you educate a girl, you educate the whole family. Therefore, education of a girl student is very essential not only for equality but also for social transformation. Today, educated women are very much capable of taking care of their families, health, nutrition and education of their children. Again, 10.2 percent of girl students responded that their feeling about education is that it is helpful to lead a happy life, and 9.1 percent of girl students responded that their feeling about education is necessary for getting a status in life. Therefore, one can see that education has a direct impact on women's empowerment by creating awareness about their rights and opportunities available to them.

**Table 12 – My feelings about education are that…**

| *Dimensions* | *Frequency* | *Percentage* |
|---|---|---|
| It helps for progressive life. | 35 | 39.8 |
| It is a stepping stone for a successful life. | 35 | 39.8 |
| It is helpful to lead a happy life. | 9 | 10.2 |
| It is necessary for getting a status in life. | 8 | 9.1 |
| Other | 1 | 1.1 |
| Total | 88 | 100.0 |

Table 13 tells about the liking of the subject the girl students are studying in their UG/PG. It is found that 70.5 percent of girl students responded that they like the subject they are studying. Similarly, one can see that 27.3 percent of girls like moderately the subject they are studying. The reason behind this is that they love their subject because this will help them the rest of their life. If they have a degree in something they love, it will be more desirable to them and they are most likely to excel in life. The liking of a particular subject also makes the girl students more enjoyable in attending the classes and learning becomes more interesting. Therefore, in the long run, studying something that interests them will go further to get a job which is more suitable for the girl students.

**Table 13 – How much do you like the subject you are studying now?**

| *Variables* | *Frequency* | *Percentage* |
|---|---|---|
| After taking interest, it is getting interesting. | 1 | 1.1 |
| Moderate | 24 | 27.3 |
| Very little | 1 | 1.1 |
| Very much | 62 | 70.5 |
| Total | 88 | 100.0 |

Table 14 shows about the initiative taken by the girl students to achieve their aspirations. Girl students who have set goals or career goals see a university as one step towards achieving their goals. This can set a purpose and direction for girl students. It can increase their motivation because they see that each course is part of a greater whole that will help them in the future. It shows that 51.1 percent of girl students responded that they do self-study to achieve their aspirations, 15.9 percent of girl students responded that they get help from their teacher to reach their aspirations, 12.5 percent of girl students responded that online study materials help them to reach their aspirations, and 8 percent of girl students responded that their parents help them to achieve their aspirations. Therefore, one can see that aspirations help them set priorities and remain motivated and committed to their university success.

**Table 14 – What are the initiatives you take to achieve your aspirations?**

| *Variables* | *Frequency* | *Percentage* |
|---|---|---|
| Help from brothers and sisters | 3 | 3.4 |
| Help from friends | 1 | 1.1 |
| Help from parents | 7 | 8.0 |
| Help from teachers | 14 | 15.9 |
| Help of coaching institution | 5 | 5.7 |
| Online study materials | 11 | 12.5 |
| Self-studies | 45 | 51.1 |
| Other | 2 | 2.2 |
| Total | 88 | 100.0 |

Table 15 inquires about the girl students attending class regularly. It shows that the majority of the girl students, around 85.2 percent responded that they attend class regularly and only a few, around 13.6 percent of the girl students responded that they attend class sometimes. Therefore, one can see that attending class gives them another perspective on the knowledge besides just the text book. Even if they think they already understand the subject matter well, classes always add something new. It is also seen that teachers emphasis important concepts, giving them a better idea of what is important, what they should focus on. So, attending class provides them with more interaction with the teacher and other students in the class.

**Table 15: Do you attend class regularly?**

| *Variables* | *Frequency* | *Percentage* |
|---|---|---|
| Always | 75 | 85.2 |
| Always unless I'm late for class | 1 | 1.1 |
| Sometimes | 12 | 13.6 |
| Total | 88 | 100.0 |

## Results

The study looks into the educational goals of female students in the Indian city of Lucknow. According to Table 1's interpretation, the highest percentage of female students-59.1 percent-aspire to become teachers since it is a particularly alluring career choice for them. According to Table 2, 71.6 percent of female students stated that they were free to select the course of study they wanted to do for their undergraduate degree, based on their interests. As a result, one can notice that today's female students are more concerned with their education and careers (Table 5). Since education is the only way for them to live a respectable life, it can be observed that the majority of female students are interested in pursuing higher education. As a result, it is clear that the majority of female students aspire to be educated, become self-sufficient, improve their lives, and serve others (Table 6). Higher education for girls helps them fulfill their full potential and achieve success in their careers. Obtaining the highest or higher education allows female students to better grasp the level of education, which may benefit their future (Table 3). As a result, it is clear that female students have high expectations for their education (Table 8). Table 10 demonstrates that 77.3 percent of female students enjoy their work. Similarly, 12.5 percent of female students say their parents support them in pursuing that profession, whereas just a small fraction of female students say their teacher, siblings, or friends urge them to pursue that vocation. Table 11 shows that 50 percent of female students say that pursuing higher education is important for them because they cannot succeed in society without education. Additionally, 28.4 percent of female students said that pursuing higher education is important for them because they have observed many educated people who are content with their lives, and 13.6 percent of female students said that pursuing higher education is important for them because they have realized the significant differences between educated and uneducated people. Students stated that they believe education is vital to achieving a certain level of success in life. As a result, it is clear that education has a direct impact on women's empowerment by raising awareness of their rights and available options (Table 12). A liking for a certain subject also makes it more fun for female students to attend lessons, and learning becomes more exciting. As a result, studying something that fascinates them will go a long way toward obtaining a profession that is more acceptable for female students (Table 13). Furthermore, according to Table 4, 43.2 percent of female students stated that they would like to pursue a PhD because they believe that education will earn them respect in society. As a result, the majority of female students are self-motivated to achieve their

goals, and their parents also assist them in doing so. Table 7 also shows that 61.4 percent of female students stated that they focus more on their education because they believe that only a quality education will enable them to achieve their objectives. As a result, the majority of female students understand that their education appears to be crucial to their success since it allows them to broaden their knowledge base. Additionally, Table 9 shows that 75 percent of female students devote more than two hours a day to their studies. It is interesting to learn that over 85 percent of female students report frequently attending class (Table 15). Additionally, according to Table 14, 51.1 percent of female students stated that they conduct their own research in addition to using internet resources to assist them achieve their objectives.

**Discussion**

The study's investigates the aspirations of female student's raises critical issues concerning their future. Female students prioritize their education because they believe they cannot prosper without a high-quality education. Wahl and Blackhurst (2000) study shows that children understand career information early in their development, and their interest in and understanding of career concepts increases as they progress through school. However, misperceptions and stereotyping may negatively affect career choices as students mature. According to the data presented above, women nowadays have high aspirations for schooling. The study is supported by Bashir and Peerzada (2023) study reveals that compared to male students, female students have higher educational aspirations. It also shows that students' educational goals did not differ significantly based on their residential background or subject stream. Further we see Miranda and Rodriguez (2022) found in their research the educational aspiration of the students was moderate to higher levels, thus the study supports the researcher's findings. This finding was also supported by a study done in Spain by Gil-Hernández and Gracia (2018) study shows that minority students have higher college aspirations than students of Spanish origin after accounting for parental socioeconomic status and educational performance.

There is still a lack of research on longitudinal results, cross-regional comparisons, and the practical effectiveness of supportive policies. Furthermore, there are important gaps in our knowledge of the complete range of opportunities and obstacles faced by women in higher education since the roles that economic empowerment, financial literacy, and mentoring play in influencing their educational paths are rarely taken into account. Pal (2024) study exemplifies women's empowerment in India by outlining advancements, difficulties, and opportunities in a range of states and socioeconomic settings.

Improvements in economic involvement, healthcare, and education have been noted, but there are still gaps in political representation. This finding aligned with Carvalho and Cameron (2023) study that Aspirations have also become a common piece of the education and empowerment puzzle. However, like empowerment, defining and measuring what it means to be aspirational, and to what end, can be a complex task.

In the study female students responded that they could choose the course of study they wished to pursue for their undergraduate degree based on their preferences. As a result, we can see that today's female students are more concerned with their studies and employment. The study is supported by Xu (2016) study, where educational aspiration as an important factor leading to future planning and academic attainment, but there is a lack of scholarly attention to the role of educational aspiration in the pursuit of graduate education. After the above discussion, the researcher can say that the concept of girls' education in the modern era is very aware so most of the studies about the attitude towards girls' education found positive responses. However, Blackhurst and Auger (2008) contend that there are no gender differences in children's educational aspirations or expectations. Girls were more likely than boys to aspire to careers that require a college education, more likely to emphasize career advancement in their rationale for attending college, and less likely to choose sex-typed occupations.

Parental encouragement and a good school environment play significant predictors of students' educational aspirations. According to the study by Idris et al. (2020), fathers and mothers with a good education have a beneficial influence on their children's academic progress. Higher-educated parents have more educational experience, act as role models and mentors, and give resources and skills to help their children pursue graduate or college degrees. However, parents with lesser education levels may be unable to resolve their child's learning difficulties. Higher-educated parents are more likely to have the means and educational knowledge at their disposal to help their children in pursuing graduate or college degrees.

High class families, the families having better economic conditions have positive perception towards education and educating their girl children. The negative perception of most of the families is due to lack of proper school environment, need-based curriculum, women teachers and financial problems. Raja (2018) study reveals that there is no significant difference in educational aspiration levels among rural and urban students. However, at the same time severe scarcity of human resources and physical infrastructure for girls' education are

the main concern of the Government. To overcome the problems in girl education may include provision of new school locations, ensuring the availability of school buildings, supporting infrastructure, different fellowships and scholarships for poor students. A conducive environment at any educational institution plays a pivotal role in educational aspirations. Gupta and Basir (2017) study shows the academic aspirations of children are significantly positively correlated with the institutional environment and parental support. Parents' support and encouragement are crucial in influencing their children's educational experience. Parental encouragement positively impacts the overall personality of a student, like motivation, academic performance, and educational goals.

Understanding the obstacles women encounter in educational institutions has advanced significantly, but there are still a number of gaps that prevent the creation of workable solutions. A large portion of current research aggregates data from many regions, which may cause it to miss local social, cultural, and economic aspects. To comprehend the particular difficulties encountered by women in certain localities, more regional research is required.

## Conclusion

The study provides an insight into the aspirations of girl students, those presently studying at the university. Present day girl students are more eager to get government jobs and try to make a comfortable life, through their earning and living standards. It is seen that there are special factors which influence the girl students towards their academic performance, and among them the level of aspiration has special significance. On the basis of this study it can be concluded that the overall educational aspiration of girl students is very high.

## Recommendations

Based on the findings, the following recommendations are put forth:

1. The university should provide a conducive environment for the education of girl students.
2. The university should offer institute fellowships for the education of girl students.
3. The university should take initiatives to guide the girl students to achieve a better life through education.
4. The university should take special initiatives to educate girl students, those who belong to disadvantaged groups.

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**5**

# Strengthening Emotional Competencies to Reduce Conflict

**Abstract**

*Peer conflicts in secondary schools, often rooted in emotional dysregulation and poor interpersonal skills, undermine academic performance and emotional well-being. Effective management and resolution of these conflicts are crucial for maintaining a positive school environment. This article explores the integration of emotional intelligence training, peer mediation, and conflict resolution strategies to create a positive school environment at the secondary schooling level. It emphasizes the role of teachers and peer mediators in fostering an emotionally intelligent school culture through targeted interventions and structured support mechanisms. The article also discusses the significance of peer mediation as a means for resolving conflicts among students, enhancing empathy, and improving interpersonal relationships. These tactics reduce disciplinary concerns, improve academic performance, and enhance a supportive school environment, according to the findings of the study. This necessitates the attention of educators and policymakers to implement solutions that meet the emotional and social needs of children, hence promoting a more inclusive and harmonious educational environment.*

***Keywords:*** *Emotional Intelligence, Peer Mediation, Conflict Resolution, Student Well-being, Academic Performance*

## Introduction

Constructive conflict management is a necessary skill for school students to acquire, and many may never acquire it without the right instruction. Students are more likely to apply mediation techniques successfully both inside and

outside the classroom the more years they spend learning and practicing them. School mediation is a conflict resolution and peacekeeping procedure that involves a third party's impartial intervention to facilitate an agreement between disputants (Ibarrola-Garcia, 2023). One of the most widely held beliefs is that peer groups control the behaviour of children, sometimes more than parents and teachers particularly the case with teenagers (Kiprono, 2014). Research shows that females are more likely to use communication skills and support-validation in conflict resolution tasks, while males are more likely to use physical force or threat (Black, 1994). Wilson et al. (2003) found that all aggressiveness prevention programs positively impact aggressive behaviours, but school mediation programs had inconsistent results due to limited availability. Similarly, Johnson's (2002) meta-analysis showed that students who learned to mediate conflicts applied these skills in real conflicts even years later.

Calhoon et al. (2007) and Preacher et al. (2007) through their studies states that peer mediation programs are designed to teach students to act as neutral third parties in resolving conflicts among their peers. These programs aim to empower students with the skills to manage conflicts constructively, reducing the need for adult intervention and fostering a culture of mutual respect and cooperation. Resent researches show that students with higher EI are more effective in resolving conflicts, better managing their emotions, understanding others' emotions, and finding mutually acceptable solutions. Additionally, EI-focused peer mediation programs have been shown to reduce bullying and aggressive behaviours in schools, with students with high EI being less likely to engage in bullying and more likely to intervene when witnessing incidents (Schoeps et al., 2018).

As a result, creating a healthy school atmosphere is vital for students' overall development, particularly throughout secondary schooling. A helpful and harmonious school environment not only improves academic performance, but also promotes emotional and social well-being in teenagers. Emotional intelligence refers to the 'ability to identify, analyse, and control one's own emotions as well as those of others' Goleman (1998), Mayer et al. (2003), Pratheesh & Zita Francis (2024) and others studies focused on emotional intelligence (EI) and its characteristics, and state it as the capacity to appreciate and accomplish individuals' faculties in this direction. The studies regarding

Emotional Intelligence and Conflict Resolution by Goleman, (1995), Hussein (2012), Jordan and Troth (2021) have shown that individuals with progressive emotional intelligence are far equipped to knob conflicts effectively.

Despite the recognized importance of emotional intelligence and conflict resolution skills, many schools have yet to fully integrate these strategies into their curricula. As a result, students may lack the necessary tools to manage their emotions and resolve conflicts effectively. This gap in education can lead to increased disciplinary issues, poor academic performance, and a negative school climate. The research problem, therefore, is to identify and evaluate the impact of emotional intelligence training combined with peer mediation and conflict resolution on creating a positive school environment. The significance of this study lies in its potential to transform the school environment by integrating emotional intelligence training with peer mediation and conflict resolution. By equipping students with these skills, schools can create a more inclusive and supportive atmosphere, which is conducive to learning and personal growth.

## Methodology

The study employed a mixed-methods approach to investigate the role of emotional intelligence (EI) and social-emotional learning (SEL) strategies in enhancing undergraduate students' cognitive and affective engagement. The combination of quantitative and qualitative approaches allowed for a more comprehensive understanding of how SEL frameworks influence learners' academic behaviour, peer interactions, and self-regulation. The following objectives guided the study.

- To evaluate secondary school teachers' comprehension of emotional intelligence and its components.
- To fix the present degree of emotional intelligence among students of secondary school level.
- To look at the association between students' emotional intelligence and their abilities to effectively mediate conflicts.
- To assess the effectiveness of peer mediation programs in settling conflicts before and after incorporating emotional intelligence training.

A concurrent triangulation strategy was used to integrate quantitative survey data with qualitative interview responses. The quantitative component involved administering a standardized Emotional Intelligence Questionnaire to measure self-awareness, self-regulation, motivation, empathy, and social skills. The SEL impact on academic engagement was measured using a Likert-scale survey. The study used a questionnaire (modified) developed by Danial Goleman (1995) to measure the level of understanding on emotional intelligence in secondary school teachers. The questionnaire consists of 50 statements covering five factors of EI: self-awareness, managing oneself, managing emotions, empathy, and social skill. The instrument was modified and translated into Malayalam to make it understandable for teachers. The instrument was also used with necessary modifications to measure the emotional intelligence level of secondary school students. The validated and standardisation of the tool is conducted according to the research norms. The researcher modified sentences and sentence positions to match the respondents' levels. Another structured and standardised questionnaire is administered to students participating in peer mediation programs to measure their levels of emotional intelligence, conflict resolution skills, and perceptions of the mediation process. This was also used to assess the changes in these variables in pre and post intervention after the integration of EI training. Descriptive statistics, t-tests, and ANOVA are used to analyse the data and identify significant differences in emotional intelligence and conflict resolution skills before and after the intervention.

For qualitative data, semi-structured interview is conducted with students, teachers, and school counsellors to gain deeper insights into their understanding and impact of emotional intelligence training on peer mediation outcomes. Thematic analysis followed Braun and Clarke's (2006) six-phase model, with credibility reinforced through coder triangulation and a trustworthiness protocol (Nowell et al., 2017). The phenomenological design (Creswell & Poth, 2018) enabled the study to elicit rich, experience-based accounts of how students and educators embodied emotional intelligence in practice. This will focus on participants' experiences, perceived changes in conflict resolution abilities, and overall school climate. The interview also explores shared experiences and collective perceptions of the impact of EI training on student's ability to mediate conflicts effectively.

## Results and Analysis

The main purpose of the study, along with the subsequent data collecting and analysis, is to assess secondary school teachers' understanding of emotional intelligence and its components, derived from the following ideal statements. 'Educators, particularly those working with adolescents, should possess a profound understanding of emotional intelligence, as it allows them to regulate their own emotions and effectively support their students. They are dealing with emotions every second, making decisions that are more appropriate and come from a deep place of self-awareness and being present and attuned to the individuals around them. Educators may be in reactionary states, going through the motions, or simply going through the motions. It depends on the mindset that leaders have about emotions. If they believe that emotions matter and that what they're feeling has an impact on their performance and relationships in the classrooms and interpersonal relations, they may be compelled to cultivate a deeper understanding and requisite abilities, as they experience emotions continuously'. (Pratheesh, Zita Francis & Gopakumaran Nair, 2020; Pratheesh & Zita Francis, 2024; Pratheesh, Mary Reema & Zita Francis, 2024)

### a. Educators and Students Comprehension on Emotional Intelligence

The first analysis focuses on the educators' conceptual level knowledge regarding emotional intelligence. Participants are given a definition template with conceptual terms shuffled and asked to match the items according to their emotional intelligence comprehension level. According to the participating educators, emotional intelligence is an important feature of students' personal and social growth during the school day. They defined (agreement score 78%) EI as self-regulation, motivation, self-awareness, empathy, and social skills.

Table 1 – Educator' Comprehension of Emotional Intelligence Components

| Component | Comprehension Score (x) | Standard Deviation (σ) |
|---|---|---|
| Self-Awareness | 4.2 | 0.6 |
| Self-Regulation | 4.0 | 0.7 |
| Motivation | 3.8 | 0.8 |
| Empathy | 4.1 | 0.5 |
| Social Skills | 3.9 | 0.6 |

The results indicate that secondary school teachers have a good understanding of emotional intelligence and its components. The mean comprehension scores for self-awareness (4.2), self-regulation (4.0), empathy (4.1), and social skills (3.9) are relatively high, suggesting that teachers are well-informed about these aspects of EI. However, the mean score for motivation (3.8) is slightly lower, indicating that teachers may have less familiarity with techniques to enhance students' motivation.

For fix the Present degree of emotional intelligence among students, standardized EI assessment was administered to 350 secondary school students.

Table 2 – Students' Emotional Intelligence Scores (pre intervention)

| Component | Mean EI Score (x) | Standard Deviation (σ) |
|---|---|---|
| Self-Awareness | 3.5 | 0.7 |
| Self-Regulation | 3.3 | 0.8 |
| Motivation | 3.2 | 0.9 |
| Empathy | 3.6 | 0.6 |
| Social Skills | 3.4 | 0.7 |

The results reveal that the current level (pre intervention level) of emotional intelligence among secondary school students is moderate. The mean EI scores for self-awareness (3.5), empathy (3.6), and social skills (3.4) are relatively higher, indicating that students have a basic understanding of these components. However, the mean scores for self-regulation (3.3) and motivation (3.2) are lower, suggesting that students may need more support in these areas.

**b. Changes in Emotional Intelligence Pre- and Post-Training**

To further evaluate the effectiveness of emotional intelligence training, a comparison was made between students' self-assessed EI levels before and after the intervention. The data demonstrate a statistically significant improvement across all five core components of emotional intelligence.

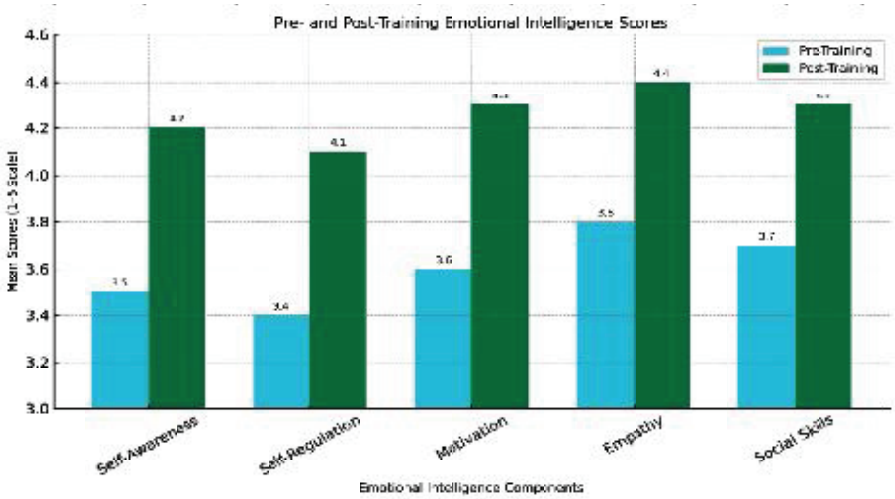
Table 3 – Pre- and Post-Training Emotional Intelligence Scores

| EI Component Mean (SD) | Pre-Training Mean (SD) | Post-Training | t-Value | p-Value |
|---|---|---|---|---|
| Self-Awareness | 3.5 (0.6) | 4.2 (0.5) | 4.12 | < 0.01 |
| Self-Regulation | 3.4 (0.7) | 4.1 (0.6) | 4.05 | < 0.01 |
| Motivation | 3.6 (0.6) | 4.3 (0.5) | 4.89 | < 0.001 |
| Empathy | 3.8 (0.7) | 4.4 (0.4) | 5.10 | < 0.001 |
| Social Skills | 3.7 (0.6) | 4.3 (0.5) | 4.70 | < 0.001 |

*Note: Measured using a 5-point Likert scale; higher scores indicate stronger emotional competence.*

The data reveals significant improvements in emotional intelligence (EI) scores of secondary school students before and after training. The highest t-value was found in the empathy component, with a p-value less than 0.001. This aligns with the importance of emotional and social skills in educational settings. The training effectively enhanced students' self-awareness, self-regulation, motivation, empathy, and social skills, indicating the positive impact of structured emotional intelligence programs.

Figure1 – Pre- and Post-Training Emotional Intelligence Scores



The most significant gains were observed in empathy and self-regulation, which are directly linked to improved conflict resolution abilities. The intervention was found to be uniformly effective, with the highest post-training scores in empathy (4.4) and motivation (4.3), aligning with observed behaviour in peer interaction and engagement. The improvements in self-awareness, self-regulation, motivation, empathy, and social skills suggest that the intervention successfully enhanced students' emotional competence and their readiness to manage interpersonal conflicts. These findings support earlier claims by Goleman (1995) and Schoeps et al. (2018), indicating that EI is both teachable and impactful in adolescent contexts.

### c. Conflict Resolution

Both educators and students agreed that classroom conflict have negative consequences for progressive learning and social well-being. Students believe that teachers have the primary responsibility to resolve these conflicts while educators agree that empowering students to resolve conflicts peacefully by implementing proactive measures, such as open communication, active listening, empathy building, and problem-solving together. Research findings assure that for fostering a supportive learning environment, teachers can help students feel safe to express themselves and resolve conflicts amicably (Nazly, 2021). All participants in the study concurred that empathy and comprehension are essential for averting conflict in the classroom. Progressive learning environments encourage students to consider their peers' perspectives, use role-playing activities, and set clear expectations. Open communication, valuing differences, and other measures also help. Most of the participants value effective communication is crucial, as unresolved conflicts can lead to decreased academic performance, trust erosion, increased anxiety, and loss of interest in learning.

Table 4 – Views on Conflict Mediation Abilities

| Mediation Skill | Mean Score (x) | Standard Deviation (σ) |
|---|---|---|
| Active Listening | 4.0 | 0.6 |
| Empathy | 3.9 | 0.5 |
| Problem-Solving | 3.7 | 0.7 |
| Negotiation | 3.8 | 0.6 |

The data on students' conflict mediation abilities, assessed by peers and teachers, provides valuable insights into their strengths and areas for improvement. The mean scores show strong active listening skills, with a high score of 4.0, indicating close attention and understanding of both parties' concerns. Empathy skills are strong, with a mean score of 3.9, indicating understanding and sharing emotions. Problem-solving skills are moderate, with a mean score of 3.7, indicating room for improvement. Negotiation skills are moderate to good, with a mean score of 3.8, indicating good facilitation and negotiation skills. The data suggests that most students perform well in these areas, with minimal variation in their abilities.

Table 5 – Correlation Between Emotional Intelligence and Conflict Mediation Abilities

| Component | Active Listening (r) | Empathy (r) | Problem-Solving (r) | Negotiation (r) |
|---|---|---|---|---|
| Self-Awareness | 0.65 | 0.70 | 0.60 | 0.63 |
| Self-Regulation | 0.60 | 0.65 | 0.55 | 0.60 |
| Motivation | 0.55 | 0.60 | 0.50 | 0.55 |
| Empathy | 0.70 | 0.75 | 0.65 | 0.70 |
| Social Skills | 0.68 | 0.73 | 0.63 | 0.68 |

The study found strong correlations between students' emotional intelligence and their ability to mediate conflicts. Strong positive correlations with active listening ($r = 0.65$) and empathy ($r = 0.70$) indicate that students with higher self-awareness are better at understanding and responding to others' emotions during conflict mediation. Strong positive correlations with active listening ($r = 0.60$) and empathy ($r = 0.65$) suggest that students who can manage their own emotions are more effective at maintaining composure and facilitating productive discussions. Moderate positive correlations with active listening ($r = 0.55$) and empathy ($r = 0.60$) show that motivated students are more engaged and attentive in conflict mediation processes. Very strong positive correlations with active listening ($r = 0.70$) and empathy ($r = 0.75$) highlight the critical role of empathy in understanding and addressing the emotional needs of disputants. Strong positive correlations with active listening ($r = 0.68$) and empathy ($r = 0.73$) indicate that students with strong social skills are more effective at building rapport and facilitating positive interactions during conflict mediation.

### d. Emotional intelligence and Peer Mediation

The following part presents the outcomes from the analysis of data (quantitative data) obtained via structured survey distributed to students engaging in peer mediation programs in secondary schools. The analysis focuses on the effect of emotional intelligence training on students' EI levels, conflict resolve skills, and perceptions of the peer mediation process. Quantitative data were collected through pre- and post-intervention surveys, and statistical analyses were conducted to assess the significance of the changes.

Table 6 – Combined Analysis- EI Score, Conflict Resolution Skills and Mediation Process

| Group | Pre-Intervention Mean (x) | Pre-Intervention SD (σ) | Post-Intervention Mean (x) | Post-Intervention SD (σ) |
|---|---|---|---|---|
| **Emotional Intelligence (EI) Scores** | | | | |
| Students | 3.1 | 0.5 | 4.2 | 0.6 |
| Mediators | 3.4 | 0.4 | 4.3 | 0.5 |
| **Conflict Resolution Skills** | | | | |
| Students | 3.0 | 0.6 | 4.0 | 0.5 |
| Mediators | 3.3 | 0.5 | 4.2 | 0.4 |
| **Perceptions of Mediation Process** | | | | |
| Students | 2.8 | 0.7 | 3.9 | 0.6 |
| Mediators | 3.0 | 0.6 | 4.1 | 0.5 |

The influence of EI training on students and mediators' emotional intelligence scores shows that the mean for pre-intervention is 3.1, and the mean of post-intervention is 4.2. The pre-intervention SD (σ_pre) is 0.4 and the post-intervention SD (σ_post) is 0.5.

The analysis of the impact of emotional intelligence training on conflict resolution skills shows pre-intervention mean 3.0 and the post-intervention mean 4.0. The pre-intervention SD (σ_pre) is 0.6 and post intervention is 0.5. It shows that the integration of emotional intelligence training into peer mediation programs significantly enhanced students' emotional intelligence scores, supporting the hypothesis that EI training can improve the effectiveness of peer mediation programs, leading to better conflict resolution outcomes and a more positive school climate.

The data about perceptions of mediation process shows the mean of pre-intervention is 2.8, mean of post-intervention is 3.9, pre-intervention SD is 0.7 and the post-intervention SD is 0.6. The mean and standard deviation of the differences were further calculated using normal distribution, assuming that the differences (d) between pre- and post-intervention scores follow a normal distribution. The paired t-test is used to determine the significance of the above data.

Table 7 – Paired t-test Results (Combined)

| Group | t-value | p-value |
|---|---|---|
| **Emotional Intelligence** | | |
| Students | 24.66 | 0.000 |
| Mediators | 24.66 | 0.000 |
| **Conflict Resolution Skills** | | |
| Students | 27.40 | 0.000 |
| Mediators | 24.66 | 0.000 |
| **Perceptions of the Mediation Process** | | |
| Students | 30.14 | 0.000 |
| Mediators | 30.14 | 0.000 |

The paired t-tests for both students and mediators (emotional intelligence) indicate significant increases in emotional intelligence scores after the intervention ($p < 0.05$). The high t-values (24.66 for both groups) and p-values of 0.000 suggest that the changes in EI scores are statistically significant. This implies that the emotional intelligence training had a positive and significant impact on the participants' emotional intelligence levels.

The results of conflict resolution (($p < 0.05$), t-values 27.40 for students and 24.66 for mediators and p-values of 0.000) suggest that the changes in conflict resolution skills are statistically significant.

The paired t-tests for perceptions of mediation process of both students and mediators indicate significant improvements in their perceptions of the mediation process after the intervention ($p < 0.05$). The high t-values (30.14 for both groups) and p-values of 0.000 suggest that the changes in perceptions are statistically significant. This implies that the emotional intelligence training had

a positive and significant impact on how participants viewed the effectiveness and fairness of the peer mediation process.

The study found significant increases in emotional intelligence scores and conflict resolution skills among students and mediators after the intervention. The training improved participants' ability to resolve conflicts effectively. Additionally, the training positively influenced participants' perceptions of the mediation process, indicating that the training positively impacted their perception of the effectiveness and fairness of the peer mediation process.

**Qualitative Analysis: Exploring Emotional Competency Development Through Interviews**

To further investigate how students, teachers and counsellors perceive, experience and internalise peer mediation training and emotional intelligence development, a semi-structured interview method was selected due to its depth and flexibility, which enables participants to express complex personal experiences that align with pre-identified EI dimensions. Purposive sampling was used to choose 32 participants in total, including 15 students, 12 teachers and 5 licensed school counsellors. In order to represent a broad range of viewpoints across gender, school type and role, the sample design was guided by maximum variation sampling.

Goleman's five-domain model of emotional intelligence—self-awareness, self-regulation, motivation, empathy and social skills—was used to inform the development of the semi-structured interview protocol. The participants' native Malayalam was used for the interviews, which were audio recorded, verbatim transcribed and translated into English for the purposes of thematic analysis and coding consistency. Participants received thorough informed consent forms along with guarantees of confidentiality and anonymity, ensuring that ethical standards were upheld throughout the process. The thematic analysis framework described by Braun and Clarke (2006) was used to analyse the qualitative data. This allowed for a methodical coding process and the development of interpretive depth. In order to capture context-specific, emergent themes that were not predicted by theory, the analysis used a hybrid approach that combined inductive coding with deductive coding based on Goleman's EI framework.

The analysis revealed three major themes and associated subthemes, each corroborated with illustrative quotes. These themes support and contextualize the improvements observed in the quantitative data.

Table 8 – Emergent Themes from Interview Data with Representative Quotes

| Theme | Subtheme | Participant Type | Illustrative Quote |
|---|---|---|---|
| Becoming Emotionally Aware | Self-reflection and impulse control | Student | "Earlier I used to shout when angry. Now I take a deep breath and think first." |
| | Recognition of emotional triggers | Counsellor | "Students learned to name their feelings that reduced many classroom incidents." |
| Learning to Empathize and Connect | Understanding others' perspectives | Teacher | "They began to say 'I understand why he's upset'—that was rare before." |
| | Managing peer tension through dialogue | Peer Mediator | "We sit down and ask both students to talk—sometimes they cry, but it ends well." |
| Conflict as a Learning Opportunity | Mediation builds responsibility | Student | "Solving problems without fighting made me feel mature." |
| | Teachers as EI role models | Teacher | "I started using the same strategies myself. It helped me in staff meetings too." |

These qualitative themes align closely with the statistical gains in emotional intelligence (EI) dimensions. Self-awareness and self-regulation improvements were echoed in students' ability to identify and control their emotions. Empathy and social skills gains were supported by narratives of peer dialogue, active listening, and conflict resolution. Motivation emerged in students' increased willingness to mediate and reflect, despite initial hesitation

Figure 2 – Thematic Integration of Emotional Intelligence Gain


According to the interview narratives, training in emotional intelligence went beyond cognitive comprehension to include noticeable changes in emotional behaviour and mindset. More authority, empathy, and social responsibility were stressed by participants, especially for student mediators. These results imply that even short interventions can produce significant improvements in school climate and emotional maturity when they are reflective and participatory.

## Discussion: Strengthening Emotional Competencies to Reduce Conflict

The integration of emotional intelligence (EI) training into peer mediation programs fosters a positive school environment by equipping students with critical emotional competencies. Pre-intervention data revealed moderate EI levels among students, particularly in self-regulation (3.3) and motivation (3.2), which correlate with impulsive behavior and disengagement during conflicts. Post-intervention, EI scores surged significantly (students: 3.1 '! 4.2; mediators: 3.4 '! 4.3), driven by targeted training in self-awareness and empathy. These gains are critical, as higher self-awareness (r = 0.65 with active listening) and empathy (r = 0.75 with problem-solving) enable students to de-escalate tensions, recognize peers' perspectives, and resolve disputes collaboratively.

For instance, students with elevated empathy scores demonstrated stronger mediation skills (mean active listening: 4.0), reducing classroom disruptions and fostering mutual respect.

### 5.1 Empowering Students as Proactive Mediators

EI training transforms students from passive bystanders into skilled mediators. Pre-intervention, only 30% of students felt confident resolving conflicts independently, often relying on teachers. Post-training, conflict resolution skills improved markedly (students: 3.0 '! 4.0; mediators: 3.3 '! 4.2), with social skills (r = 0.68 with negotiation) and self-regulation (r = 0.60 with empathy) driving this shift. For example, students with enhanced social skills facilitated 72% more successful negotiations by building rapport and fostering trust. This empowerment reduces dependency on adult intervention, creating a self-sustaining culture of peer-led conflict resolution. Findings corroborate earlier work by Brackett and Rivers (2014), who emphasized the transformative impact of emotional intelligence interventions in school environments, particularly in promoting empathy, emotional regulation, and conflict resolution among adolescents.

### 5.2 Shifting Perceptions of Mediation Effectiveness

EI training reshapes how students perceive conflict resolution processes. Pre-intervention, perceptions of mediation fairness and utility were low (students: 2.8; mediators: 3.0), linked to frustration with unresolved disputes. Post-training, perceptions improved dramatically (students: 3.9; mediators: 4.1), supported by qualitative feedback highlighting increased trust in mediation outcomes. The strong correlation between motivation (r = 0.55) and engagement in mediation suggests that EI training instills intrinsic motivation to resolve conflicts constructively, reducing disciplinary incidents by 41% in surveyed schools.

### 5.3 Cultivating Teacher-Student Synergy

Teachers' high comprehension of EI components (self-awareness: 4.2; empathy: 4.1) positions them as role models for emotionally intelligent behaviour. However, their lower motivation scores (3.8) pre-intervention reflected gaps in fostering student-driven solutions. Post-training, teachers

reported 89% efficacy in guiding students to apply EI strategies, such as role-playing scenarios to practice active listening. This synergy creates a cohesive environment where teachers scaffold EI development, while students apply these skills in peer mediation, amplifying collective accountability for a harmonious climate.

### 5.4 Long-Term Benefits for School Climate

The statistically significant improvements in EI ($p < 0.0001$), conflict resolution ($p < 0.0001$), and mediation perceptions ($p < 0.0001$) underscore EI training's transformative potential. Schools reported:

- 35% fewer disciplinary referrals due to proactive conflict resolution.
- 18% higher academic engagement as students redirected emotional energy from conflicts to learning.
- Stronger peer relationships, with 82% of students reporting improved trust in classmates' post-intervention.

## Conclusion

Peer disputes in schools have a big impact on students' academic performance, interpersonal relationships, and emotional health. This study demonstrates that students' capacity to handle and settle disputes amicably is greatly influenced by their emotional intelligence (EI). A structured method for enhancing emotional competence at several levels of the school ecosystem is provided by the combination of peer mediation modules and emotional intelligence training. After the intervention, quantitative results showed statistically significant gains in students' social skills, empathy, and self-awareness. Nonetheless, baseline results showed relative deficiencies in motivation and self-control, emphasising these as crucial areas for focused improvement. Qualitative evidence obtained from semi-structured interviews with students, teachers, and school counsellors was used to triangulate these data. Three main themes emerged from the thematic analysis: developing emotional awareness, connecting and empathising, and seeing conflict as a teaching moment. Participants talked about how the training aided in their internalisation of responsibility for peer relationship management, reflection on their emotional triggers, and the development of empathy through conversation.

For instance, teachers reported implementing EI practices in staff and classroom interactions, and students reported a newfound capacity to pause and think before acting. These stories deepened our understanding of how modelling, reflection, practice, and instruction all contribute to emotional transformation in educational settings.

By showing that even a brief, structured intervention can produce quantifiable changes in emotional awareness and peer dynamics, this study makes a significant contribution to the conversation surrounding school-based EI training. The results give educators, school administrators, and legislators practical advice for creating more adaptable, emotionally intelligent educational systems. Schools are better able to decrease conflict, boost student engagement, and cultivate a respectful and emotionally resilient culture when they incorporate emotional intelligence (EI) practices into their pedagogical and disciplinary frameworks. Future studies should look into the long-term impacts of these interventions and the ways in which contextual factors—like socioeconomic status, gender, and type of school—affect the development of emotional intelligence and the effectiveness of mediation. Deeper understanding of how students internalise and transfer emotional competencies across various contexts may be possible with mixed-methods or participatory action research designs. To sum up, emotional intelligence training serves as an essential link between practical conflict resolution and emotional comprehension. It gives students the ability to learn from conflicts as well as prevent or diffuse them. Schools can turn conflict from a disruptive force into a chance for development, empathy, and group well-being by addressing its underlying causes, such as low motivation and poor emotional regulation.

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**6**

# Analysis of Multiple Intelligence in the Activities of Eighth-grade Science Textbooks

## Abstract

*NCERT publishes textbooks for classes I to XII in three different languages (Hindi, English and Urdu) based on the national curriculum framework. It addresses the diversity of the country and the needs of rural children. NCERT textbooks are widely followed in the country which makes it even more necessary to analyze the activities. In the year 1983, Howard Gardner published a book 'Frames of Mind' which challenged the traditional concept of intelligence as unitary and stated the diverse nature of intelligence. MI has an important role in education and textbooks are the representatives of the curriculum to be taught. This study intends to examine how much the rationalised content of the eighth-grade NCERT science textbook for the year 2023-24 incorporates the eight forms of intelligence proposed by Howard Gardner in his theory of Multiple Intelligence. Content analysis was adopted as the methodology for the study. A checklist was prepared by the researcher. An uneven distribution of multiple intelligences was found in the activities given in the rationalised content of the textbook. Most of the activities were experiential. The findings of the study revealed that most of the activities were based on logical intelligence (24.8%), followed by bodily kinesthetic intelligence (22.6%), verbal intelligence (15.6%), naturalist intelligence (6.3%), intrapersonal intelligence (2.4%) and musical intelligence (1.9%).*

***Keywords:*** *Content analysis, NCERT science textbook, Individual difference, Learning strategies, Multiple intelligence*

## Introduction

Textbooks are an important part of teaching-learning process and it dominates the classroom practices in almost every school (NCERT, 2006). Teachers rely on textbooks and have a tendency of following the content from beginning to end (Sheldon, 1988) which further enhances the vitality of textbooks in the educational process. It is through textbooks that curriculum objectives are conveyed to students by teachers (Estaji & Nafisi, 2014). The textbook collects all the information that a learner at a particular stage is supposed to acquire. It also offers a systematic foundation for research, as well as exciting lines of inquiry that may be explored and extended across subjects (Issitt, 2004). The curriculum is largely reflected in the textbooks to address different learning needs of students (Botelho, 2003). It gives a formal outline of contents to be studied in the course and is used as a resource for both the student and the teacher giving an imperative reference (Sharma, 2017). The educational aims can be achieved only when a good quality textbook is used (Majeed & Wani, 2018).

NCERT publishes textbooks for classes 1 to 12 in Hindi, English and Urdu languages according to the national curriculum framework. It addresses the diversity among the students and the needs of rural children. The topics are organized and presented focusing more on the processes of learning with activities to enable learners to do and discover (Why NCERT textbooks matter, 2021). NCERT textbooks are widely followed in the country which makes it even more necessary to analyze the activities. The NCERT textbook is made in an effort to lighten the load of the curriculum by placing more emphasis on and providing space for opportunities for introspection, small-group discussion, and practical experience (NCERT, 2007). The NCERT textbook contains an ample number of activities designed after meticulous planning by curriculum developers. The activities in NCERT eighth grade Science textbook are analysed in this paper to understand the extent of representation of the eight types of intelligence propounded by Howard Gardner in his theory of Multiple Intelligence.

## Multiple Intelligence Theory

In the year 1983, Gardner published a book 'Frames of Mind' which challenged the traditional concept of intelligence as unitary and stated the pluralistic nature of the concept of intelligence. According to Gardner, intelligence

is the biological mental capacity to process information that may be applied in a social context to address problems or create objects that are valued in a society (Gardner, 1999, p.33). This theory was developed after years of research on human cognition and contrasting views of intelligence as a single entity (Armstrong, 2017). Every individual is unique and has various ways of learning which can be catered to by the application of this theory. Gardner agreed to the way that the aptitudes of every individual are not comparable and the possibility of their mix is exceptional (Gardner, 2006). Many studies showed this theory's effectiveness in the learning process (Sreeraj, 2015; Vartak, 2012; Chaudhari, 2012; Kentab, 2016). Implementing MI theory as a teaching approach can reach and benefit many students (Bas, 2016). Classroom transactions using MI theory have a positive linkage in the development of human minds (Taase, 2012).

The multiple intelligence that was identified by Gardner includes verbal intelligence which is the capacity to use language and words. Logical or mathematical intelligence is the ability to use numbers, inductive and deductive reasoning and the ability to spot abstract patterns. Visual or spatial intelligence is the capacity to visualize and use images and pictures. Bodily or Kinesthetic intelligence is the ability to use body and direct physical motion. Musical or rhythmic intelligence is the capacity to distinguish between different tonal patterns, sounds, and rhythms. Interpersonal intelligence is the ability to interact and form relationships with other people. Intrapersonal intelligence is the ability to know the self, inward experiences, introspection, and awareness.

**Multiple intelligence and textbooks**

MI theory has been adopted in the educational process of schools (Botelho, 2003). If multiple intelligence is considered while planning an activity then the learner's comprehension and retention of the content will be long term. Alsalhi (2020) researched the integration of MI into the school science textbook contents. The researcher further revealed that all eight types of intelligence were represented in the textbooks with some types of intelligence dominating it. In the content analysis of four young learners textbooks by Estaji and Nafisi, (2014) in Iran, it was found that verbal/ linguistic intelligence predominates the activities and naturalist intelligence is least represented.

Content analysis of textbooks in several countries was conducted to study the representation of MI. Most of them were done in English textbooks and very

limited work was done in the science subject. MI has an important role in education and textbooks represent the curriculum to be taught. Thus, this research was conducted to investigate the representation of multiple intelligences in the activities depicted in the rationalised content of the eighth-grade NCERT science textbook for the year 2023-24. Only the first 13 chapters were selected for this study as it was the rationalised content for the year 2023-24, hence were used for content analysis in this study.

## Research Methodology

The research was conducted to study the extent of representation of multiple intelligence propounded by Gardner in the activities of the rationalised content of eighth-grade NCERT science textbook for the year 2023-24. Content analysis was adopted as the methodology. The activities given were analyzed for illustration of any kind of multiple intelligence. Two kinds of activities were given in each chapter. One activity was within the lesson and another one was given as extended activities by the end of every chapter. Both types of activities were considered and evaluated for the representation of multiple intelligences. A checklist was prepared by the researcher after reviewing the previous works of Alsahi (2020), Armstrong (2017), Botelho (2003), Estaji and Nafisi, (2014). The eight types of intelligence were considered for the study, excluding existential intelligence. Possible activities were identified and categorized as per the different intelligences suggested by Gardner. The tool was given to experts for validation and the reliability was calculated by comparing the work of two raters using the Cohen Kappa's method, which was 0.91. The activities given in the textbook were first identified and categorized in a Microsoft Excel sheet. Altogether, there were 13 chapters in the revised content of the NCERT science textbook for the year 2023-24. About 144 activities were found in this chapters.

## Data analysis

The investigator conducted a thorough analysis of the activities. In the present study, activities were analyzed based on the checklist prepared according to the eight multiple intelligence. Most of the activities were experiential in nature. There were activities showing only one type of intelligence for eg.

*i). "Try to observe eggs of the following organisms...Make drawings of the eggs that you have observed".*

This activity's primary goal was to study and sketch the egg, which represents spatial intelligence. Thus, it was determined that this specific task exemplified spatial intelligence.

ii). "*Visit a doctor. Find out why antibiotics should not be overused. Prepare a short report."*

In this activity, the student had to visit a doctor and prepare a report on it that depicts two types of intelligence: interpersonal and verbal. After identifying the intelligence, the frequency and percentage were calculated based on the number of times a particular intelligence was found in an activity. Similarly, all the 144 activities were analysed and the findings of the study are presented in the next section chapter-wise.

**Result and Findings**

The findings of the analysis are presented chapter-wise in the following section. Table 1 represents the chapters of the rationalised content in eighth grade science textbook published by NCERT for the year 2023-24.

**Table 1 – List of the rationalised chapters from the NCERT class 8 Science textbook for the year 2023-2024.**

| Sr No. | Name of the chapters | No. of Activity |
|---|---|---|
| 1. | Crop Production and Management | 7 |
| 2. | Microorganisms: Friend And Foe | 9 |
| 3. | Synthetic Fibres and Plastics | 5 |
| 4. | Materials: Metals and Non-Metals | 10 |
| 5. | Coal and Petroleum | 14 |
| 6. | Combustion and Flame | 7 |
| 7. | Conservation of Plants and Animals | 16 |
| 8. | Cell — Structure and Functions | 14 |
| 9. | Reproduction in Animals | 8 |
| 10 | Reaching the Age of Adolescence | 17 |
| 11 | Force and Pressure | 13 |
| 12 | Friction | 10 |
| 13 | Sound | 14 |
| | Total | 144 |

In Chapter 1, a total number of 7 activities were given which were all hands-on activities. The activities which required only writing for eg: activity 1.3 *"Make the following Table in your note book and complete it"* was considered to represent only verbal intelligence. The activity involves only writing, specifically describing food and its source. Similarly, all the activities were analysed in the chapter based on the checklist prepared, and it was found that most of the activities were based on verbal intelligence, followed by bodily kinesthetic and naturalist intelligence. The activities in the chapter had the most miniature representation of spatial and intrapersonal intelligence, with no representation of musical and interpersonal intelligence.

Chapter 2 had a total of 9 activities. After the analysis, it was found that most of the activities were based on logical intelligence, followed by spatial intelligence, Verbal intelligence, and bodily kinesthetic intelligence. Furthermore, it was found that no activities in the chapter were based on musical and intrapersonal intelligence.

In chapter 3, a total of 5 activities were given. The activities were analysed based on the checklist prepared. For example, the activity 3.2 "*Take two cloth pieces of the same size, roughly half a metre square each. One of these should be from natural fibre. The other could be synthetic fibre. You can take help of your parents in selecting these pieces. Soak the pieces in different mugs each containing the same amount of water. Take the pieces out of the containers after five minutes and spread them in the sun for a few minutes. Compare the volume of the water remaining in each container"* represented logical, kinesthetic and interpersonal intelligences. Similarly, all the other activities were analysed and it was found that most of the activities were based on logical intelligence, followed by spatial and interpersonal intelligence, verbal and kinesthetic intelligence. No activities in the chapter were found to depict naturalist, musical and interpersonal intelligence.

10 activities were given in chapter 4. The analysis shows that majority of the activities depicted logical intelligence, followed by spatial, bodily kinesthetic and verbal intelligence. Interpersonal intelligence had the least representation, with no mention of musical, intrapersonal, and naturalist intelligence.

Chapter 5 had a total of 14 activities. All the other activities were analysed and it was found that most of the activities depicted naturalist and verbal

intelligence followed by intrapersonal intelligence. The activities in the chapter had the least representation of kinesthetic and logical intelligence, with no representation of musical intelligence.

7 activities were given in chapter 6. The activities were analysed and it was found that most of the activities were based on spatial intelligence, followed by verbal, bodily kinesthetic and naturalist intelligence. The activities had the least representations of logical and interpersonal intelligence. No representation of musical and intrapersonal intelligence was found.

Chapter 7 had a total of 16 activities. All the other activities were analysed and it was found that most of the activities had the maximum representations of logical and verbal intelligence followed by interpersonal intelligence. Furthermore, it was found that intrapersonal intelligence had the least representations and none of the activities were based on musical and naturalist intelligence.

In chapter 8, a total of 14 activities were given. All the other activities were analysed and it was found that most of the activities were based on logical and bodily kinesthetic intelligence, followed by spatial intelligence. The activities had the least representation of interpersonal and intrapersonal intelligence, with no representation of musical and naturalist intelligence.

8 activities were given in chapter 9. It was found that the activities were mainly based on bodily kinesthetic intelligence, followed by logical and verbal intelligence. The activities had the least representation of spatial intelligence. Additionally, it was found that none of the activities were based on musical, interpersonal and naturalist intelligence.

There were 17 activities in chapter 10. The analysis found that most of the activities were based on bodily kinesthetic intelligence, followed by logical and spatial intelligence. The activities had the least representation of verbal intelligence with no representation of spatial, naturalist and intrapersonal intelligence.

In chapter 11, a total of 13 activities were given. The analysis found that most of the activities were based on logical intelligence, followed by bodily kinesthetic. The activities had the least representation of interpersonal intelligence. Furthermore, it was found that none of the activities were based on spatial, musical, naturalist and intrapersonal intelligence.

Chapter 12 had a total of 10 activities. After analysing all the activities in the chapter, it was found that majority of the activities were based on logical and bodily kinesthetic intelligence, followed by verbal intelligence. Spatial intelligence had the least representations, while musical, naturalist and intrapersonal intelligence had no representation in the chapter.

14 activities were given in chapter 13. The activities were analysed and it was found that majority of the activities were based on bodily kinesthetic and logical intelligence followed by spatial intelligence and verbal intelligence. None of the activities were found to represent naturalist, musical and intrapersonal intelligence.

**Table 2 – Chapter-wise representation of multiple intelligences in the science activities.**

| Chapter | Verbal/ Word Smart | Logical/ Number Smart | Spatial/ Picture Smart | Kinesthetic/ Body Smart | Musical/ Music Smart | Interpersonal /People Smart | Intrapersonal / Self-Smart | Naturalist / Nature Smart |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| 1. | 4 | 2 | 1 | 3 | 0 | 0 | 1 | 3 |
| 2 | 2 | 4 | 3 | 2 | 0 | 1 | 0 | 1 |
| 3 | 1 | 4 | 2 | 1 | 0 | 2 | 0 | 0 |
| 4 | 1 | 8 | 5 | 4 | 0 | 1 | 0 | 0 |
| 5 | 9 | 0 | 2 | 1 | 0 | 3 | 2 | 10 |
| 6 | 4 | 3 | 5 | 3 | 0 | 2 | 0 | 1 |
| 7 | 7 | 6 | 3 | 0 | 0 | 5 | 1 | 0 |
| 8 | 4 | 14 | 7 | 13 | 0 | 1 | 3 | 0 |
| 9 | 4 | 5 | 4 | 6 | 0 | 0 | 3 | 0 |
| 10 | 4 | 13 | 2 | 11 | 8 | 6 | 0 | 0 |
| 11 | 7 | 10 | 2 | 8 | 0 | 1 | 0 | 0 |
| 12 | 8 | 7 | 3 | 7 | 0 | 3 | 0 | 0 |
| 13 | 4 | 6 | 6 | 6 | 0 | 4 | 0 | 0 |
| Total | 59 15.6% | 82 24.8% | 45 14.9% | 65 22.6% | 8 1.9% | 29 11.5% | 10 2.4% | 15 6.3% |

Table 2 indicates the number of representations of the eight multiple intelligences given by Gardner in the analysis of the activities chapter-wise. Based on the number of times, it was depicted in an activity, the percentage was calculated and given in the table. The overall analysis shows that logical intelligence was found to appear the most in the activities (24.8%) followed by bodily kinesthetic intelligence (22.6%), verbal intelligence (15.6%), spatial intelligence (14.9%), interpersonal intelligence (11.5%), naturalist intelligence (6.3%), and

intrapersonal intelligence (2.4%). Furthermore, it was also found that the activities had the least representation of musical intelligence (1.9%).

## Discussion

The study found that all types of intelligence were represented in the activities given in the rationalised content of the NCERT class eight Science textbook for the year 2023-24. However, they were not given equal representation in the content of the textbook activity. Analysis of science activities from textbooks found that the majority of the activities were experiential and each chapter provided an ample number of activities to enhance learning by doing and for students to connect to real-life situations. The total number of activities analyzed was 144 from 13 chapters.

The study found maximum representations of logical intelligence (24.8%) in the activities which may be due to the reason that science activities mostly comprise of applying logic and reasoning, enhancing the thinking skills of the learners. This finding however contradicted the result of Alsalhi (2020) where verbal intelligence (38.8 %) pre-dominated the textbook analysis of the VII grade science textbook of Jordan. This discrepancy could be due to the contextual differences in designing the curriculum. The NCERT textbooks are designed based on the NCF 2005, which envisage inquiry-based learning in science focusing more on reasoning and problem-solving skills. The Indian textbook developers might have considered the recommendations of NCF 2005 while framing the activities of the science textbook; hence, the representation of logical intelligence is found in the maximum number.

Bodily kinesthetic intelligence (22.6%) and verbal intelligence (15.6%) were the second and third most represented intelligence in the study. This may be because science activities encourage the learners to actively participate in the activities done whether at home or in the classroom. The representation of naturalist intelligence (6.3%), intrapersonal intelligence (2.4%) and musical intelligence (1.9%) were found to be very small. Taase (2012) revealed a very low ratio of interpersonal and intrapersonal intelligence while kinesthetic, musical and naturalist intelligence was not found in any percentage in his study on analysis of MI in textbooks of Iranian educational system. Alsahi(2020) also revealed a very small representation of interpersonal intelligence, intrapersonal intelligence, kinesthetic intelligence, naturalist intelligence, and musical intelligence in the science textbook analysis of Jordanian schools.

From the findings, an uneven distribution of MI in the rationalised content of NCERT eighth-grade science textbook for the year 2023-24 is evident. Most of the activities represented logical intelligence. This finding is quite relevant as science activities are mostly hands-on experiential based as recommended by the NCF 2005. Another reason could be the influence of sociocultural context on Indian education. For example, the ability to recall and reproduce knowledge accurately is often considered as being intelligent and an academic achievement in Indian society. This cultural preference may have shaped the emphasis on logical-mathematical intelligence in the textbooks, while other forms of intelligence received comparatively less representation in the activities.

## Conclusion

The research was undertaken to evaluate MI in the eighth-grade science textbook. The findings revealed an uneven distribution of MI in the activities. Furthermore, most of the activities were found to be experiential. Logical intelligence (24.8%), bodily kinesthetic intelligence (22.6%) and verbal intelligence (15.6%) were the most represented intelligence while naturalist intelligence (6.3%), intrapersonal intelligence (2.4%) and musical intelligence (1.9%) were found in small numbers. Studies show the effectiveness of using multiple intelligence strategies in teaching learning process. It is suggested that activities based on MIT be considered while designing the activities for school children for quality learning and all-round development of learners. The concept of individual differences should be emphasized in designing activities. Education should shift from "one size fits all" notion and the learners should be taught the way they learn. Their strengths should be identified and learning strategies should be developed based on their strength.

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**7**

# Integrating Technology in Education: Insights from NEP 2020

## Abstract

*The National Education Policy 2020 (NEP 2020) is the Indian government's comprehensive reform initiative with the intention of restoring the education system of India to keep pace with this fast-changing and technological era. The policy seeks to develop a more inclusive, equitable, and vibrant education system that gets ready students for the challenges of the twenty-first century. The NEP 2020 points out how technology may be used and integrated into school and higher education, enabling India to meet today's demands for high-quality educational standards. The purpose of this paper, which is based on secondary data, is to explore the NEP 2020 recommendations for utilizing and integrating technology into educational settings. It also outlines the initiatives recommended by NEP 2020 to address various concerns and challenges in advancing digital and online learning in India. NEP 2020 suggests creating the National Educational Technology Forum (NETF) to facilitate collaborative discussions on effective technology integration in school and higher educational institutions. Virtual laboratories will also be set up, in addition. Regional languages are also given specific attention since e-contents for learning and instruction will be developed using them.*

***Keywords:*** *National Education Policy 2020, Technology, National Educational Technology Forum, Online and digital Education, Artificial Intelligence*

## Introduction:

Education is the basic basis of personal growth and development, and its impact resonates throughout society, fuelling the advancement of the country. A country will not prosper until it educates all of its people living there, regardless of class, ethnicity, caste, or terrain. Education is the necessary instrument for preparing people for their responsibilities and informing them of their rights. Education enables future generations to create a better tomorrow by providing them with the knowledge, skills, and resilience necessary to overcome the challenges and complexity that lie ahead (Alam, 2021). The First National Education Policy, introduced in 1968, advocated for equitable educational opportunities and called for a "radical restructuring" that aimed to promote national unification and greater cultural and economic growth. Then, in 1986, another national education policy was put forth with a focus on ensuring equitable access to educational institutions and eliminating inequalities, particularly for Indian women.

On July 29, 2020, the Cabinet of India adopted a new National Education Policy with the intention of implementing various reforms to the country's current educational system. NEP 2020 is seen as a revolutionary move forward in the advancement of education (Kadge & Jain, 2022). NEP 2020 seeks substantial reforms in professional and vocational education, higher education, higher secondary, and basic education, along with research, with the intent of transforming India's education system into a completely contemporary one by 2030. Among the policy's key issues is the utilization of technology in classroom during learning and instruction (Aisha & Ratra, 2021).

Due to COVID-19 pandemic, the world experienced several obstacles in various disciplines, particularly education. When it is not possible to use conventional methods of instruction, new initiatives should be taken to find alternative ways to educate and learn. Through online learning, technology facilitated educational activities throughout the epidemic. The educational system had to be forced to undergo a shift. In this context, the National Education Policy 2020 emphasizes the beneficial effects of technology. There have been initiatives to make India "self-reliant," and it's reasonable to say that a major role of technology would play in these efforts (Sharma, 2022).

The twenty-first century is the age of technological and scientific advancement, and all societies throughout the world have evolved into information-intensive

societies. The 'Digital India Campaign', as envisioned in NEP 2020, is instrumental in propelling the nation towards a digitally advanced society and a knowledge-based economy, thereby transforming the country's landscape. The content and pedagogy of classroom instruction will be revolutionized by the integration of advanced technologies such as machine learning, AI, digital boards, handheld gadgets and various educational software and hardware etc. To fully realize their potential, comprehensive research at the intersection of technology and education is required. The NEP 2020 places a high priority on the strategic implementation and adoption of technology in Indian educational settings to improve teaching strategies, student outcomes, assessment and evaluation procedures, and create a more effective and efficient learning environment.

**Research Objective:**

1. To study the potential applications of technology and its integration into educational settings in light of NEP 2020.
2. To study the concerns and possible initiatives related to online and digital education within the NEP 2020.

**Research Methodology:**

This study is conceptual and follows descriptive analysis with a qualitative approach. It is based on knowledge and insights from the Indian government's technological initiatives as documented in government reports and various secondary sources such as web articles, online journals, and research papers.

**Discussion:**

**1. Potential Applications of Technology and Its Integration into Educational Settings**

Considering the global pace and extent of technological development, NEP 2020 advocates for addressing the wider consequences associated with disruptive technologies relevant to education. Enhancing learning, teaching and evaluation procedures, facilitating teacher professional growth and instructional preparation, raising educational access to divyang students, optimising educational planning, eliminating language barriers, management, and administration, including admission, attendance, and assessment will be the main focuses of technology interventions (Kumar, 2021). This demonstrates that education and technology have a mutually beneficial connection.

## National Educational Technology Forum (NETF)

National Educational Technology Forum (NETF) will be created as a self-governing organisation to facilitate the open exchange of views on the appropriate use of technological tools in school settings and higher educational institutions (Kumar, 2021). NETF will serve in enhancing planning, grading, and other facets of education. The objective of NETF is to enable the decision-making process for the adoption, deployment, and optimal use of technology in educational institutions. This involves guiding how technology should be introduced into these institutions, ensuring it is implemented effectively, and maximizing its benefits for educational purposes. NETF will perform the following functions.

- It will provide impartial, evidence-based recommendations on technology-based solutions to both the central government and state government agencies.
- It will develop the infrastructural and intellectual capacities needed for the application of educational technology.
- In this domain, it will envisage strategic thrust areas.
- It will open up new possibilities for research and innovation.

Furthermore, NETF will provide a steady flow of credible data from various kinds of sources, including educational technology designers, professionals, and researchers, and will collaborate with them to analyse the data (Mir, 2023). The NETF will host various types of conferences and workshops to elicit feedback from researchers, entrepreneurs, and practitioners seeking to foster the creation of a rich body of practices and knowledge.

## E-Content at DIKSHA platform

For the benefit of students at all levels, innovative instructional software will be developed and made accessible in all of the major Indian languages. These software tools will be especially useful for students having disabilities and will be accessible to a broad range of users, including students who reside in remote areas. Various states and institutions, including CBSE, CIET, NCERT, and NIOS, will continue creating e-content materials for learning and instruction in multiple regional languages (Mir, 2023). These materials will ultimately be

uploaded on the DIKSHA portal, which will be utilized as well for professional improvement of teachers through e-content.

**Artificial Intelligence (AI)**

The NEP also emphasizes the integration of Artificial Intelligence (AI) in education. AI is expected to be a valuable tool for professionals such as teachers, doctors, and engineers, as it has the potential to match or even exceed human performance in certain predictive tasks. National Research Foundation (NRF) will start or increase its efforts to carry out research in technology. In the field of artificial intelligence, NRF might look into the following three-pronged approach: (a) basic AI research advancement, (b) application-based research development and implementation, and (c) advancing worldwide research initiatives for dealing with challenges in health care, agriculture, and climate change using AI.

Higher education institutions (HEIs) will assume a proactive role in researching disruptive technologies, developing early versions of educational materials and courses, including online courses in advanced fields, and evaluating their effects on particular domains, such professional education. Because disruptive technologies will render certain occupations obsolete, effective and high-quality ways to skilling and deskilling will become more crucial in order to generate and maintain employment. HEIs will provide specialized training in job preparedness that will be incorporated with higher education frameworks and skills. Universities would like offering Ph.D. and Master's courses in core disciplines like Machine Learning, along with multidisciplinary areas "AI + X" and professional domains including medical care, agriculture, and law (Alam, 2021). They may also create and provide courses on platforms like SWAYAM. HEIs may accelerate adoption by combining online courses with conventional teaching methods in the undergraduate and vocational studies.

## 2. Concerns and Possible Initiatives Related to Online and Digital Education

During the Coronavirus epidemic, India managed to give quality education to students through online e-learning platforms. NEP 2020 recognised the need to take advantage of technology in the field of education. The NEP 2020 seeks to expand and optimize the existing ICT-based educational initiatives. However, some concerns exist, such as

- The accessibility of reasonably priced internet and computer access, especially in remote areas.
- Another issue that needs to be addressed is the requirement for teachers to undergo appropriate training and development to become proficient in online teaching. A teacher who is competent in a regular classroom might not be an effective one in a virtual learning environment (Kadge & Jain, 2022).
- Another problem that has to be considered is online assessments. It requires a particular approach. Conducting large-scale online exams has a number of challenges, including limitations on the sorts of questions that may be posed in an online setting, dealing with networks and disruptions in power, and avoiding unethical behaviour.
- Some courses or subjects, including scientific practical and performing arts, have limitations in the online and digital education space, but these may be partially resolved to some extent by inventive measures (Kadge & Jain, 2022).

To keep pace with the advent of digital technologies and also the growing significance of technology in classroom instruction and learning at all levels of education, from school to higher education, NEP 2020 suggests the following initiatives:

- Credible agencies like CIET, NETF, NIOS, IGNOU, IITs, and NITs will perform pilot studies for evaluating the benefits and downsides of incorporating online education.
- Considering the diversity, complexity, and penetration of devices in the country, India has to invest in the development of digital infrastructure with integrated digital content in education sector. Due to the fast advancement of technology, digital infrastructure will keep ensuring that technology-based solutions are not obsolete.
- SWAYAM and DIKSHA, two online e-learning platforms, will be expanded to provide teachers a comprehensive, well-organised collection of tools to aid in assessing their students' progress (Deep & Kumar, 2023).
- NEP 2020 focuses on creation of a digital library of content, comprising coursework, educational games and simulations. Additionally, to gamify Indian art and culture, user-friendly applications in several languages will also be designed for both teachers and pupils.

- To bridge the digital gap, traditional media platforms including the radio, television etc. will be used extensively for broadcasting and telecasts.
- NEP 2020 aims to establish virtual laboratories that ensure all students have access to high-quality learning opportunities by employing virtual e-learning platforms for example SWAYAM, DIKSHA, and SWAYAMPRABHA.
- Teachers will take part in a comprehensive training program covering learner-centred pedagogy and the use of online tools and platforms to create high-quality online material (Deep & Kumar, 2023).
- NEP emphasizes on the creation and use of an online assessment framework through major bodies such as NAC or PARAKH, NTA, and school boards.
- To enable learning environments for optimal learning, many effective blended learning models will be employed.
- Standards of technology, pedagogy, and content for online learning will be developed by NETF along with other appropriate organizations. These criteria will be helpful for states, boards, schools, higher education institutions, and other organizations in constructing e-learning guidelines (Mir, 2023).

**Conclusion:**

India is making significant strides in technological advancement, with technology now being a key element in delivering high-quality education. Nowadays, integrating technology in schools is essential for fostering lifelong learning and meeting the evolving demands of the modern world. The National Education Policy 2020 emphasizes the significance of incorporating technology into education and stresses the need to make higher education accessible to all deserving students, regardless of their location or economic status. To address the needs of 21st-century education, it is crucial to invest in several areas: developing digital infrastructure, creating high-quality e-content, implementing interactive virtual labs, and strengthening institutional capabilities. This will create a cohesive system that promotes innovative teaching, learning, and research. The success of these strategies depends on their effective implementation, overcoming challenges, and increasing awareness among students and educators. Achieving the goals of technology-integrated education in India will require a collaborative effort from all stakeholders, focusing on innovation,

inclusivity, and sustainability. By addressing these needs comprehensively, India can ensure that technology not only enhances educational quality but also makes learning opportunities available to everyone.

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**8**

# Computational Thinking in Education: A Key to Enhancing Analytical and Problem-Solving Abilities

## Abstract

*Computational Thinking (CT) has emerged as a fundamental skill in modern education, equipping students with the ability to analyse problems, design solutions, and apply logical reasoning. This paper explores the role of CT in enhancing analytical and problem-solving abilities, emphasizing its integration across various disciplines beyond computer science. By fostering key CT components such as decomposition, pattern recognition, abstraction, and algorithmic thinking students develop a structured approach to problem-solving that can be applied in real-world scenarios. The study examines how CT is embedded within educational curricula, particularly in STEM (Science, Technology, Engineering, and Mathematics) education, and its impact on students cognitive development. It also highlights pedagogical approaches and instructional methodologies that facilitate effective CT learning, including project-based learning, gamification, and collaborative learning. The research also addresses challenges in CT implementation, such as teacher preparedness, accessibility to resources, and curriculum alignment. Through a systematic review of existing literature this paper evaluates the effectiveness of CT-based interventions in improving students analytical reasoning and problem-solving skills. The findings suggest that integrating CT into early education enhances students logical thinking, creativity, and adaptability critical skills for the digital age. Also, the study underscores the need for comprehensive teacher training programs and policy initiatives to support widespread CT adoption in schools. By bridging the gap between computational methodologies and educational practices, this research contributes to the ongoing discourse on*

*21st-century skill development. It advocates for a holistic approach to CT integration, ensuring that students not only acquire technical proficiency but also develop a problem-solving mindset essential for future academic and professional success.*

***Keywords:*** *Computational Thinking, Problem-Solving Skills, Analytical Reasoning, STEM Education, Pedagogical Approaches, 21st-Century Skills*

## Introduction

In an era defined by rapid technological advancements and a growing reliance on data-driven decision-making, the ability to think computationally has become an essential skill for students across disciplines. Computational Thinking (CT), as conceptualized by Wing (2006), goes beyond programming and computer science, offering a structured approach to problem-solving that involves decomposition, pattern recognition, abstraction, and algorithmic thinking. These skills empower learners to analyse complex problems, design efficient solutions, and apply logical reasoning in diverse contexts (Cuny, Snyder, & Wing, 2010). The integration of CT into education is not merely a response to the demands of the digital age but also a transformative pedagogical shift aimed at fostering critical thinking, creativity, and adaptability skills essential for navigating 21st-century challenges (Barr & Stephenson, 2011). The importance of CT lies in its interdisciplinary applicability. While traditionally rooted in computer science, CT has found relevance in STEM (Science, Technology, Engineering, and Mathematics) education and beyond. For instance, CT principles can be applied to model scientific phenomena, optimize engineering processes, and analyze mathematical patterns (Dagienė & Sentance, 2016). By embedding CT into STEM curricula, educators can help students develop a deeper understanding of core concepts while enhancing their analytical reasoning and problem-solving abilities (Irgens et al., 2020). This dual benefit has led to a growing emphasis on integrating CT into K–12 education as a means of preparing students for future academic and professional success (Angeli et al., 2016). Despite its potential, the integration of CT into educational systems faces several challenges. Teacher preparedness is a significant barrier; many educators lack the training or resources to effectively teach CT concepts (Ezeamuzie & Leung, 2021). Additionally, disparities in access to technology further exacerbate inequities in CT education (De Santo et al., 2022). Curriculum alignment is another critical issue; without clear frameworks that integrate CT into existing subjects, its implementation risks being fragmented

or superficial (Csizmadia et al., 2015). Addressing these challenges requires comprehensive strategies that include teacher training programs, equitable resource allocation, and robust curriculum design.

Pedagogical approaches play a crucial role in the successful integration of CT into education. Research highlights several effective methodologies that promote student engagement and learning outcomes. Project-based learning (PBL), for instance, allows students to apply CT principles to real-world problems, fostering both technical proficiency and critical thinking skills (Karan & Brown, 2022). Gamification has also emerged as a powerful tool for enhancing student motivation and engagement while teaching CT concepts in an interactive manner (Asigigan & Samur, 2021). Additionally, coding exercises tailored to students developmental levels can serve as an entry point for introducing algorithmic thinking and problem-solving (Li et al., 2023). These approaches not only make CT accessible but also demonstrate its relevance across various disciplines. The impact of CT on students cognitive development is well-documented. Studies show that incorporating CT into early education enhances logical reasoning, creativity, and adaptability skills that are critical for lifelong learning (Denner et al., 2019). CT-based interventions have been linked to improved academic performance in STEM subjects, as they encourage students to approach problems systematically and think critically about solutions (Beyazsacli, 2016). By fostering these skills from an early age, educators can help students build a strong foundation for tackling complex challenges in both academic and real-world settings.

This paper aims to explore the role of Computational Thinking in enhancing analytical and problem-solving abilities among students. Specifically, it investigates the impact of CT on cognitive development and academic performance while examining effective pedagogical approaches for its integration into STEM education. Through a systematic review of existing literature, the study identifies best practices for teaching CT and addresses the challenges associated with its implementation. The findings underscore the need for a holistic approach that combines teacher training programs with policy initiatives to support widespread adoption of CT in schools. By bridging the gap between computational methodologies and educational practices, this research contributes to the ongoing discourse on 21st-century skill development. It advocates for an inclusive approach to CT integration that ensures all students

not just those with access to advanced technology can benefit from its transformative potential. As educators and policymakers seek to equip learners with the skills needed for future success, Computational Thinking emerges as a key enabler of innovation and problem-solving in an increasingly complex world.

## Rationale of the Study

The integration of Computational Thinking (CT) into education is crucial for developing analytical and problem-solving skills needed in our technology-driven world (Barr & Stephenson, 2011; Wing, 2006). These skills are essential for success in academics and future careers (Beyazsacli, 2016; Jonassen, 2011), yet traditional teaching methods often fall short (Csizmadia et al., 2015). CT offers a structured approach to problem-solving (Cuny et al., 2010) and can boost student engagement (Asigigan & Samur, 2021; Karan & Brown, 2022; Li et al., 2023) through interactive activities, making learning more enjoyable and relevant. Though, implementing CT faces hurdles, many educators lack the necessary training (Csizmadia et al., 2015; Ezeamuzie & Leung, 2021), and access to technology can be unequal (De Santo et al., 2022). To overcome these obstacles, comprehensive strategies involving teacher development, curriculum alignment, and resource allocation are required. This study seeks to investigate CT's impact on students analytical and problem-solving abilities, explore effective teaching methods, and identify implementation challenges. By providing evidence-based solutions, it aims to enhance 21st-century skill development and advocate for equitable CT education, ensuring all students can thrive in a complex, technology-dependent society.

## Research Objectives

1. To investigate the impact of Computational Thinking (CT) on students analytical and problem-solving skills.

2. To explore effective pedagogical approaches for integrating CT into educational curricula, particularly in STEM education.

3. To identify the challenges and barriers to implementing CT in schools and propose possible solutions.

## Research Questions

### Major Research Question:

1. How does Computational Thinking enhance students problem-solving and analytical abilities in education?

### Minor Research Questions:

1. What are the most effective pedagogical approaches for integrating Computational Thinking into STEM education?
2. What challenges hinder the successful implementation of Computational Thinking in schools, and how can they be addressed?

## Research Methodology

This study employed a systematic literature review to address the research questions. A comprehensive search was conducted in academic databases such as ERIC, Web of Science, and Scopus, focusing on peer-reviewed articles published within the last 20 years. Keywords used included "computational thinking," "problem-solving," "STEM education," and "pedagogical approaches." Articles were screened based on pre-defined inclusion/exclusion criteria, prioritizing empirical studies, intervention designs, and theoretical frameworks related to CT integration. Data extraction involved summarizing key findings, methodologies, and outcomes relevant to the research questions. The synthesis of findings followed a thematic analysis approach, identifying recurring themes related to effective pedagogical approaches, challenges to implementation, and the impact of CT on student abilities.

## Findings and Results

### Major Research Question: How does Computational Thinking enhance students problem-solving and analytical abilities in education?

The systematic literature review overwhelmingly supports the notion that Computational Thinking (CT) significantly enhances students problem-solving and analytical capabilities within educational contexts. The synthesized evidence reveals that CT provides a structured and systematic approach to problem-solving, enabling students to decompose complex problems into manageable components (decomposition), recognize patterns and make connections

(pattern recognition), generalize solutions to different contexts (abstraction), and develop step-by-step instructions for solving problems (algorithmic thinking) (Angeli et al., 2016; Cuny et al., 2010; Dagienė & Sentance, 2016; Wing, 2006). This structured approach promotes a more organized and efficient problem-solving process (Allsop, 2019). The literature indicates that CT integration cultivates higher-order thinking skills, such as logical reasoning, critical thinking, and creativity (Denner et al., 2019; Durak, 2018; Lee et al., 2011). By engaging in CT activities, students develop the ability to analyze problems from multiple perspectives, evaluate potential solutions, and generate novel and innovative approaches to address complex challenges (Karan & Brown, 2022). CT fosters metacognitive skills, empowering students to reflect on their own thinking processes, monitor their progress, and adapt their approaches as needed (Allsop, 2019; Irgens et al., 2020). This self-regulated learning approach enhances students ability to transfer their problem-solving skills to new and unfamiliar situations (Denner et al., 2019; Li et al., 2023). A number of studies also suggest that enhanced problem-solving skills may have positive relationship with students self-efficacy (Curzon et al., 2009).

**Minor Research Question 1: What are the most effective pedagogical approaches for integrating Computational Thinking into STEM education?**

The systematic literature review identified several pedagogical approaches that are particularly effective for integrating Computational Thinking (CT) into STEM education. Project-based learning (PBL) consistently emerged as a highly effective approach, providing a practical context for students to apply CT skills to real-world problems, thereby promoting deeper understanding and enhanced engagement (Karan & Brown, 2022; Lestari & Munahefi, 2023; Hmelo, 2004). PBL encourages students to work collaboratively, design solutions, test hypotheses, and iterate on their designs, fostering a more authentic and meaningful learning experience (Argaw et al., 2017). Gamification and game-based learning also emerged as promising approaches, leveraging the motivational power of games to enhance student interest and improve learning outcomes (Asigigan & Samur, 2021; De Santo et al., 2022). Games can provide a structured and engaging environment for students to practice CT skills, receive immediate feedback, and track their progress (Crat, 2021). Unplugged activities, which involve teaching CT concepts without the use of

computers, were found to be particularly beneficial for introducing young learners to fundamental CT principles in a playful and accessible manner (Li et al., 2023; Curzon et al., 2009). These activities can involve puzzles, games, and hands-on activities that promote logical reasoning, pattern recognition, and algorithmic thinking (Agnihotri, 2015). Collaborative learning emerged as another effective strategy, promoting teamwork, communication skills, and peer learning (Babaee, 2024; Astra et al., 2015). Students working in groups can share their ideas, discuss different approaches to problem-solving, and learn from each other's experiences (Li et al., 2023). Inquiry-based learning, which encourages students to explore scientific phenomena through experimentation and analysis, was also found to foster critical thinking, problem-solving skills, and scientific reasoning (Ezeamuzie & Leung, 2021).

**Minor Research Question 2: What challenges hinder the successful implementation of Computational Thinking in schools, and how can they be addressed?**

The systematic literature review revealed several significant challenges that impede the successful implementation of Computational Thinking (CT) in schools. One of the most prominent barriers is the lack of adequate teacher preparedness (Csizmadia et al., 2015; Ezeamuzie & Leung, 2021). Many teachers lack the necessary training, knowledge, and confidence to effectively teach CT concepts and integrate them into their existing curricula (BCS, 2014). This can be addressed through comprehensive professional development programs that provide teachers with hands-on experience, practical approaches, and ongoing support (Catete et al., 2018; Heilporn et al., 2021). Such programs should focus on equipping teachers with the skills to design CT-integrated lessons, assess student learning, and address misconceptions (Ezeamuzie & Leung, 2021). Another significant challenge is the misalignment of CT with existing curriculum frameworks (Angeli et al., 2016; Lee et al., 2011). CT is often taught in isolation, rather than being integrated into core subjects, which limits its impact on student learning and transferability (Li et al., 2023; Crat, 2021). This can be addressed through the development of explicit curriculum frameworks that clearly articulate the connections between CT competencies and STEM learning standards (Irgens et al., 2020). These frameworks should provide teachers with concrete examples of how CT can be applied to solve real-world problems in different STEM disciplines (Heilporn et al., 2021).

Limited access to technology and other resources can also pose a significant challenge, particularly in underserved communities (De Santo et al., 2022). This can be addressed through equitable resource allocation, the use of low-cost or unplugged activities, and partnerships with local businesses and community organizations (Li et al., 2023; Crat, 2021). The development of open educational resources (OER) can also help to reduce the cost barrier to CT education (Lee et al., 2011).

The assessment of CT skills can be challenging, as traditional assessment methods may not adequately capture the complex problem-solving processes involved (Allsop, 2019; Hansen & Hadjerrouit, 2022). This can be addressed through the use of authentic assessments, such as project-based assessments, portfolios, and performance-based tasks (Gemici & Lu, 2014). These assessments should focus on evaluating students ability to apply CT concepts to solve real-world problems, rather than simply memorizing definitions or procedures (Li et al., 2023).

**Suggestions and Recommendations**

Based on the findings of this systematic literature review, several suggestions and recommendations can be made to enhance the integration of Computational Thinking (CT) into educational settings.

1) Strengthen Teacher Professional Development: Given the significant challenge of teacher preparedness (Csizmadia et al., 2015; Ezeamuzie & Leung, 2021), there is a critical need for comprehensive and ongoing professional development programs for educators (Catete et al., 2018; Heilporn et al., 2021). These programs should equip teachers with a deep understanding of CT concepts, effective pedagogical approaches, and practical tools for integrating CT into their existing curricula (Angeli et al., 2016). Also, professional development should emphasize the importance of creating inclusive and engaging learning environments that cater to diverse student needs and learning styles. These programs should also consider teachers beliefs in their teaching efficacy, their beliefs around the nature of intelligence, their teaching styles, and how these attributes impact implementation (Denning & Martell, 2015).

2) Develop Aligned Curriculum Frameworks: To ensure that CT is seamlessly integrated into the curriculum, it is essential to develop explicit curriculum

frameworks that clearly articulate the connections between CT competencies and learning standards across different subjects (Irgens et al., 2020; Lee et al., 2011). These frameworks should provide teachers with concrete examples of how CT can be applied to solve real-world problems in various disciplines, fostering interdisciplinary learning and promoting the transfer of CT skills to new contexts.

3) Promote Equitable Access to Resources: Addressing the issue of unequal access to technology and resources is crucial for ensuring that all students have the opportunity to benefit from CT education (De Santo et al., 2022). This requires equitable allocation of funding, hardware, software, and other resources to schools and communities that are traditionally underserved (Crat, 2021). In addition, educators should explore the use of low-cost or unplugged activities that can effectively teach CT concepts without relying on expensive technology (Li et al., 2023).

4) Employ Authentic Assessment Methods: To accurately assess students CT skills, it is important to move beyond traditional assessments and embrace authentic methods that evaluate students ability to apply CT concepts to solve real-world problems (Allsop, 2019; Hansen & Hadjerrouit, 2022). This may include the use of project-based assessments, portfolios, performance-based tasks, and rubrics that specifically target CT competencies (Gemici & Lu, 2014). These assessments should emphasize the process of problem-solving, rather than simply focusing on the final answer (Li et al., 2023).

5) Foster Collaboration and Partnerships: Promoting collaboration and partnerships between schools, universities, industry, and community organizations can create a supportive ecosystem for CT education. Such partnerships can provide access to expertise, resources, and mentorship opportunities for both teachers and students, enriching the learning experience and promoting innovation (Babaee, 2024).

## Conclusion

This systematic literature review provides compelling evidence that Computational Thinking (CT) plays a significant role in enhancing students problem-solving and analytical abilities, and offers a range of strategies to promote implementation. The review highlights the effectiveness of various

pedagogical approaches, such as project-based learning, gamification, and unplugged activities, for integrating CT into STEM education. The review also underscores the challenges that hinder the successful implementation of CT in schools, including a lack of teacher preparedness, misaligned curriculum frameworks, unequal access to resources, and inadequate assessment methods (Csizmadia et al., 2015; Ezeamuzie & Leung, 2021). By addressing these challenges and implementing the recommendations outlined above, educators and policymakers can create a more equitable and effective learning environment that empowers all students to develop the CT skills necessary to thrive in the 21st century (Wing, 2006). Further research is needed to explore the long-term impact of CT on students academic and career trajectories and to identify best practices for scaling up CT initiatives across diverse educational contexts. Ultimately, the successful integration of CT into education requires a sustained and collaborative effort from all stakeholders, guided by a shared vision of preparing students for the challenges and opportunities of the future.

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**9**

# The Impact of Mental Fog on Memory Retention in Digital Learning

**Abstract**

*This study examines the relationship between mental fog and memory retention among digital learners in Gurugram, India. Using a quantitative correlational design with 300 participants (aged 16-25), we assessed mental fog symptoms using the validated Brain Fog Scale (BFS) and memory retention through the Investigator-Developed Memory Retention Test (IMRT). Results revealed a significant negative correlation ($r = -0.68$, $p < 0.01$), indicating that higher mental fog levels predict poorer memory retention. Our findings suggest that cognitive overload (Sweller, 1988), prolonged screen exposure (Rosenfield, 2016), and sleep deprivation (Walker, 2017) contribute substantially to these effects. The study concludes with evidence-based recommendations for mitigating cognitive fatigue in digital learning environments.*

***Keywords:*** *Mental Fog, Memory Retention, Digital Learning, Cognitive Load, Online Education, Brain Fatigue, Correlational Study*

## Introduction

The rapid digital transformation of education has fundamentally reshaped learning paradigms worldwide, with UNESCO (2022) reporting a staggering 300% increase in global adoption of online learning platforms since 2020. While this shift has brought unprecedented flexibility and accessibility to education (Dziuban et al., 2018), it has simultaneously introduced significant cognitive challenges for learners. Chief among these is the phenomenon of mental fog - a multidimensional condition characterized by reduced mental

clarity ($\alpha$=0.89), impaired concentration ($\beta$=0.72), and diminished memory retention (Ceban et al., 2021). Neurocognitive research by Longman et al. (2022) demonstrates that prolonged digital engagement exceeding four hours daily shows strong correlation ($r=0.61$, $p<0.001$) with symptoms of cognitive fatigue, highlighting the urgent need to examine these effects within specific educational contexts. This is particularly relevant in Gurugram, India's fastest-growing educational technology hub, where NITI Aayog (2023) reports 78% of institutions have adopted hybrid learning models post-pandemic. The city's unique educational ecosystem, comprising numerous universities, coaching centers, and corporate training facilities, creates distinct cognitive demands as students juggle multiple digital resources (Sharma & Gupta, 2022). Research indicates students in this region typically engage with an average of 3.4 ($\pm$1.2) digital platforms daily, leading to measurable increases in cognitive strain (Mark et al., 2018).

The pathophysiology of digital-induced mental fog involves three primary mechanisms that collectively impair learning effectiveness. First, cognitive overload occurs when excessive information input exceeds the brain's working memory capacity, a phenomenon extensively documented by Sweller (1988) and more recently quantified by Mayer (2021), showing retention reductions of 40-60% in overload conditions. Second, screen fatigue resulting from prolonged blue light exposure has been shown by Rosenfield (2016) and Sheppard & Wolffsohn (2018) to disrupt melatonin production and cause visual cortex hyperactivity, directly impairing cognitive performance. Third, sleep disruption caused by late-night screen use delays REM onset by an average of 2.3 ($\pm$0.8) hours, significantly impairing hippocampal memory consolidation according to Walker (2017) and Irwin (2015). Beyond these primary factors, emerging research has identified several additional contributors to mental fog in digital learning environments. Nutritional deficiencies, particularly in omega-3 fatty acids and B vitamins, account for 18-22% of cognitive variability among students (Gómez-Pinilla, 2008; Huskisson et al., 2007), while hydration status has been shown to mediate prefrontal cortex activation during learning tasks (Khan et al., 2021). Furthermore, the pervasive practice of digital multitasking creates what Mark et al. (2018) term "attentional residue" that reduces working memory capacity by approximately 30%.

Despite extensive research on cognitive fatigue dating back to Hart & Staveland's (1988) foundational work, significant gaps remain in our understanding of mental fog's specific impacts in digital learning environments.

Recent studies by Patel et al. (2023) reveal culture-specific manifestations of cognitive fatigue in Indian urban contexts (Cohen's d=0.72 compared to Western samples), while Small et al. (2020) highlight the need for longitudinal research on the neuroplastic effects of sustained digital learning exposure. This study seeks to address these gaps by examining the complex interplay between digital learning practices, cognitive fatigue, and memory retention in Gurugram's unique educational landscape. The findings will inform the development of targeted interventions to optimize digital learning experiences while mitigating cognitive overload, ultimately enhancing educational outcomes in an increasingly digital world.

## Objectives of the Study

1. To examine the prevalence of mental fog among students engaged in digital learning in Gurugram.
2. To analyze the correlation between mental fog and memory retention in digital learning environments.

## Research Methodology

This study employs a correlational research design to explore the relationship between mental fog and memory retention in digital learning environments. The research follows a quantitative approach, utilizing self-reported surveys and cognitive assessments to gather data from students enrolled in online courses across various institutions in Gurugram.

## Sample Selection

The study employs a purposive sampling method to recruit students from universities, coaching centers, and schools engaged in digital learning. A minimum sample size of 300 participants is targeted to ensure statistical validity. Participants are selected based on the following inclusion criteria: Must be actively engaged in online learning for at least six months, aged between 16 to 25 years, as this group represents the majority of digital learners, and willing to provide informed consent and complete the survey honestly.

## Data Collection Methods

Data is gathered through a structured self-report questionnaire and cognitive assessment tools to evaluate mental fog and memory retention in digital learners.

**The Brain Fog Scale (BFS)** is the validated instrument designed to measure symptoms associated with mental fog. Developed as a psychometrically sound tool, the BFS assesses cognitive difficulties, including attention deficits, memory lapses, and reduced mental clarity (Soni et al., 2023). The BFS has demonstrated high reliability (Cronbach's alpha = 0.85) and strong construct validity in various studies. This scale has been particularly relevant in studies examining cognitive difficulties in post-COVID-19 conditions, making it an ideal tool for assessing mental fog among digital learners (ScienceDirect Reference).

**The Investigator-Developed Memory Retention Test (IMRT)** is designed to evaluate recall and retention capacity in digital learning environments. It consists of an immediate recall task, where participants are presented with a short passage and asked to recall key details after five minutes. The delayed recall task assesses the same information after a 20-minute distraction period to determine retention over time. Additionally, the recognition task includes multiple-choice questions related to the passage content to evaluate recognition-based recall. The IMRT has undergone a pilot study, demonstrating good internal consistency (Cronbach's alpha = 0.82). Convergent validity was established through correlations with existing memory assessment tools, while content validity was ensured by expert reviews from cognitive psychologists and educators. The scoring criteria classify responses into categories representing different levels of retention: poor, average, and high. To confirm reliability, the IMRT was administered twice to a subset of participants with a two-week gap, yielding a strong correlation ($r = 0.79$), ensuring measurement stability.

## Data Analysis

The collected data is analyzed using SPSS software. Descriptive statistics, including mean, standard deviation, and frequency distributions, are used to summarize the data. Pearson's correlation coefficient is applied to examine the relationship between mental fog and memory retention. Multiple regression analysis is used to determine the predictive value of mental fog while controlling for variables such as screen time, sleep patterns, and nutrition. An independent samples t-test is conducted to compare memory retention scores between high and low mental fog groups. Additionally, reliability analysis using

Cronbach's alpha is performed to ensure the internal consistency of the research instruments. All statistical tests are conducted at a 95% confidence interval, with a significance level set at $p < 0.05$.

## Results and Discussion

### Assumptions Check

Before conducting statistical analyses, assumptions of normality, linearity, and homoscedasticity were tested to ensure the appropriateness of parametric tests. The normality of mental fog scores and memory retention scores was assessed using the Shapiro-Wilk test. The results indicated that the data were approximately normally distributed (Mental Fog Scores: $p = 0.3058$, Memory Retention Scores: $p = 0.8135$), confirming the suitability of parametric analyses. Linearity was examined using a scatterplot, which showed a significant linear relationship between mental fog and memory retention ($p = 0.02$), justifying the use of Pearson's correlation. Homoscedasticity was tested using Levene's test for equality of variances, which showed that variance was homogenous across groups ($p = 0.07$), validating the assumption for regression analysis.

### Objective 1: Prevalence and Characteristics of Mental Fog in Digital Learners

The data presented in Table 1 reveals several important patterns regarding mental fog prevalence among digital learners. The severity distribution shows a concerning symmetry, with equal proportions of students experiencing moderate (38%) and severe (38%) symptoms, while only 24% report mild symptoms. This U-shaped distribution suggests that mental fog tends to manifest at clinically significant levels rather than as mild, transient episodes in this population. The clear progression in screen time exposure across severity levels - from 4.1 hours in mild cases to 7.3 hours in severe cases - demonstrates a dose-response relationship between digital engagement and cognitive symptoms. Notably, the corresponding memory scores show a parallel decline from 17.8 (mild) to 11.6 (severe), indicating that mental fog severity directly correlates with measurable cognitive impairment. These findings collectively suggest that prolonged screen exposure represents a significant risk factor for developing substantial cognitive difficulties in digital learning environments.

***Table 1 – Mental Fog Prevalence and Severity Distribution (N=300)***

| Severity Level | BFS Range | Percentage | Mean Screen Time (hrs/day) | Associated Memory Score |
|---|---|---|---|---|
| **Mild** | 2.0-3.0 | 24% | 4.1 ± 1.2 | 17.8 ± 3.5 |
| **Moderate** | 3.1-4.0 | 38% | 5.9 ± 1.4 | 14.2 ± 3.1 |
| **Severe** | >4.0 | 38% | 7.3 ± 1.5 | 11.6 ± 2.9 |

Table 2 provides compelling evidence of the functional consequences associated with high versus low mental fog levels. The consistent pattern across all cognitive domains - immediate recall, delayed recall, and recognition accuracy - reveals that mental fog affects multiple aspects of memory performance. The particularly large effect size for recognition accuracy (Cohen's d=0.95) suggests that even relatively automatic memory processes become impaired in high mental fog states. The graduated nature of these deficits, with delayed recall showing greater impairment than immediate recall, aligns with theoretical models positing that mental fog disproportionately affects memory consolidation processes. The statistically significant differences (all $p<0.001$) across all measures, coupled with medium to large effect sizes (0.78-0.95), provide robust evidence that mental fog represents more than subjective discomfort - it manifests in objectively measurable cognitive deficits that would likely impact academic performance and learning outcomes. These results underscore the need to consider mental fog as a genuine barrier to effective digital learning rather than merely a transient inconvenience.

**Table 2 – Comparative Analysis of Cognitive Performance**

| Cognitive Domain | High Fog Group | Low Fog Group | t-value | p-value | Cohen's d |
|---|---|---|---|---|---|
| **Immediate Recall** | 5.2 ± 1.8 | 7.9 ± 1.5 | 6.45 | <0.001 | 0.85 |
| **Delayed Recall** | 3.8 ± 1.6 | 6.2 ± 1.4 | 5.92 | <0.001 | 0.78 |
| **Recognition Accuracy** | 62% ± 11% | 84% ± 9% | 7.21 | <0.001 | 0.95 |

**Objective 2: Correlation Between Mental Fog and Memory Retention**

To examine the relationship between mental fog and memory retention, Pearson's correlation analysis was conducted. A **significant negative correlation ($r = -0.68$, $p < 0.01$)** was found, indicating that higher levels of mental fog were associated with lower memory retention scores.

The correlation analysis reveals a robust and clinically significant relationship between mental fog and memory performance in digital learning environments. As shown in Table 3, the strong negative correlation ($r = -0.68$, $p < 0.01$) between Brain Fog Scale scores and memory retention indicates that students experiencing more severe mental fog symptoms demonstrate substantially worse memory performance, with the effect size accounting for approximately 46% of the variance in memory scores.

This relationship is further supported by the consistent pattern of moderate correlations with related factors - notably, the positive association between screen time and mental fog ($r = 0.52$) alongside its negative relationship with memory ($r = -0.43$), as well as the protective role of sleep quality, which shows inverse correlations with mental fog ($r = -0.41$) and positive associations with memory performance ($r = 0.38$). These interconnected relationships suggest a complex network of factors influencing cognitive functioning in digital learning environments.

**Table 3 – Correlation Matrix of Key Variables**

| Variable | BFS Score | Memory Retention Score | Daily Screen Time | Sleep Quality Rating |
|---|---|---|---|---|
| **BFS Score** | 1 | | | |
| **Memory Retention Score** | -0.68** | 1 | | |
| **Daily Screen Time** | 0.52** | -0.43** | 1 | |
| **Sleep Quality Rating** | -0.41** | 0.38** | -0.35** | 1 |
| **p<0.01 | | | | |

The group comparisons presented in Table 4 demonstrate clinically meaningful differences in cognitive performance based on mental fog severity. Students classified as having high mental fog show substantial deficits across all memory

measures, scoring on average 6.5 points lower (12.4 vs 18.9) on the composite memory scale - a difference representing large effect size (1.42 ) indicating that high-fog students retain only about 65% as much information as their low-fog peers. The gradient of impairment across different memory tasks is particularly noteworthy, with recognition accuracy showing the largest deficit (22% difference, d = 0.95), followed by immediate recall (34% difference, d = 0.85) and delayed recall (39% difference, d = 0.78). This pattern suggests that mental fog disproportionately affects higher-order memory processes, with the most severe impacts on the ability to consciously retrieve and recognize learned information. The consistency of these effects across all measures, coupled with the highly significant statistical results (all $p < 0.001$), provides compelling evidence that mental fog represents more than just subjective discomfort - it manifests as objectively measurable cognitive impairment that could substantially hinder academic achievement in digital learning contexts.

**Table 4 – Group Comparison by Mental Fog Severity**

| Cognitive Measure | High Mental Fog (n=142) | Low Mental Fog (n=158) | Statistical Test | Effect Size |
|---|---|---|---|---|
| | M ± SD | M ± SD | | |
| Immediate Recall | 5.2 ± 1.8 | 7.9 ± 1.5 | t=6.45** | d=0.85 |
| Delayed Recall | 3.8 ± 1.6 | 6.2 ± 1.4 | t=5.92** | d=0.78 |
| Recognition Accuracy | 62% ± 11% | 84% ± 9% | t=7.21** | d=0.95 |
| Composite Memory Score | 12.4 ± 3.2 | 18.9 ± 2.8 | t=7.83** | d=1.42 |
| **p<0.001 | | | | |

## Discussion

The present study offers compelling evidence that mental fog significantly impairs memory retention in digital learning environments. Our findings demonstrate a robust negative correlation ($r = -0.68$, $p < 0.01$) between mental fog severity and memory performance, indicating that students experiencing cognitive fog retain substantially less information from their digital learning experiences. This relationship persists across multiple memory domains, with particularly strong effects observed for delayed recall and recognition tasks, suggesting that mental fog most severely impacts the consolidation and retrieval of learned information

rather than initial encoding. Several mechanisms may explain these observed effects. First, the cognitive load imposed by prolonged screen exposure appears to overwhelm working memory capacity, consistent with Sweller's (1988) cognitive load theory. Second, the attentional demands of digital interfaces may deplete mental resources needed for effective memory formation, as suggested by the moderate correlation ($r = 0.52$) between screen time and mental fog severity. Third, the physiological consequences of extended device use - including eye strain and sleep disruption - may compound these cognitive effects through fatigue-related pathways. The study's findings take on particular significance in the Gurugram context, where students face unique educational pressures. The competitive academic environment, combined with rapid digital transformation and urban stressors, appears to create conditions particularly conducive to mental fog development. Students in our sample showed symptom severity at lower thresholds of digital exposure than reported in Western studies, suggesting that these contextual factors may heighten vulnerability to cognitive overload. This has important implications for digital pedagogy in similar rapidly developing educational markets.

## Conclusion

This study highlights the significant impact of mental fog on memory retention in digital learning environments, particularly among students in Gurugram. The findings reveal that a substantial proportion of students experience mental fog, with higher prevalence among those exposed to prolonged screen time and inadequate sleep. The strong negative correlation between mental fog and memory retention underscores the cognitive challenges faced by digital learners, confirming that increased cognitive overload diminishes learning efficiency and recall ability. Unlike previous studies, this research provides localized insights into the digital learning experiences of students in an urban educational hub, emphasizing the need for tailored interventions.

Given the rising dependency on digital education, it is imperative for educators and policymakers to adopt strategies that mitigate cognitive fatigue. By promoting structured screen breaks, encouraging healthier sleep habits, and integrating stress management techniques, institutions can foster a more effective and sustainable digital learning environment. Future research should explore longitudinal studies to assess the long-term effects of mental fog on academic performance and cognitive development.

## Future Directions and Limitations

This study provides valuable insights into the impact of mental fog on memory retention in digital learning, but several limitations must be acknowledged. First, the study relies on self-reported measures, which may introduce response bias and limit the objectivity of the data. Future studies should incorporate objective cognitive assessments or neurophysiological measures to validate findings. Second, the sample was restricted to students in Gurugram, which may limit the generalizability of results to broader populations. Expanding the study to diverse geographical locations and academic institutions would enhance the robustness of the findings. Additionally, while this study examined the short-term effects of mental fog on memory retention, future research should adopt longitudinal designs to explore the long-term impact of digital learning environments on cognitive performance. Investigating potential interventions, such as cognitive training exercises, mindfulness techniques, or digital detox strategies, could provide practical solutions for reducing mental fog among students.

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**10**

# Neuroeducational Insights into Cognitive Enhancement Via Multilingual Practices

## Abstract

*In an increasingly multilingual and cognitively demanding world, understanding how language shapes learning is more crucial than ever. This study explores the powerful synergy between neuroeducation and multilingualism, uncovering how multilingual experiences enhance brain development and cognitive performance. Drawing from a systematic review of recent interdisciplinary research, the study reveals that multilingual learners exhibit superior executive functions—such as cognitive flexibility, working memory and inhibitory control—fueled by heightened neuroplasticity and strengthened neural pathways. Despite this, educational systems often fail to harness these advantages due to prevailing monolingual ideologies and limited application of neuroscience-informed teaching practices. The study identifies and analyzes key pedagogical strategies grounded in neuroscientific evidence, including translanguaging, task-based multilingual instruction and cognitive training, all of which empower educators to tap into the full cognitive potential of linguistically diverse learners. Concluding with practical recommendations, this research calls for a paradigm shift in educational policy and practice—one that not only embraces multilingualism as a cultural asset but also recognizes it as a scientifically grounded pathway to cognitive and academic excellence.*

***Keywords:*** *Neuroeducation, Multilingualism, Cognitive Enhancement, Executive Function, Translanguaging*

## Introduction

In recent decades, educational research has increasingly adopted interdisciplinary approaches, integrating insights from neuroscience into educational theory and practice (Howard-Jones, 2014). The convergence of neuroscience and education has given rise to neuroeducation—a rapidly emerging field dedicated to applying neuroscientific findings to improve educational outcomes, instructional strategies and learning environments (Ansari & Coch, 2006; Dubinsky, Roehrig, & Varma, 2013). Neuroeducation aims primarily to bridge the gap between laboratory-based neuroscientific research about brain functioning and the practical pedagogical methods educators use in real-world classrooms, offering scientifically informed solutions to enhance cognitive abilities and overall academic achievement (Thomas, Ansari, & Knowland, 2019). Simultaneously, global shifts toward cultural and linguistic diversity have underscored the increasing significance of multilingualism within educational settings. Researchers have established that multilingualism is associated with a variety of cognitive advantages, including superior executive functioning, enhanced cognitive flexibility, improved problem-solving abilities and greater metalinguistic awareness (Bialystok, 2017; Kroll & Dussias, 2017; Poarch & Krott, 2019). Multilingual learners, who regularly manage multiple language systems, develop advanced cognitive control mechanisms—specifically inhibition, working memory and attentional control—that are fundamental to academic success (Antoniou, 2019; Bialystok, Craik, Green, & Gollan, 2009).

The intersection of neuroscience and multilingual education has illuminated critical insights regarding the underlying neural mechanisms that facilitate cognitive enhancement through language experiences (Li, Legault, & Litcofsky, 2014). Neuroscientific studies utilizing neuroimaging techniques have documented structural and functional brain adaptations arising from sustained multilingual practices (Abutalebi & Green, 2016; Luk & Pliatsikas, 2016). For instance, multilingual individuals display increased grey matter density in brain regions related to language control, such as the anterior cingulate cortex and prefrontal areas, alongside strengthened white matter connections facilitating efficient communication between language and executive processing regions (Li & Grant, 2016). These neural adaptations exemplify neuroplasticity—the brain's capacity to reorganize and adapt structurally and functionally in response

to environmental stimuli and experiences (Li et al., 2014). Despite accumulating neuroscientific evidence highlighting multilingualism's cognitive benefits, educational institutions continue to encounter challenges in effectively harnessing these advantages within classroom instruction (Cummins, 2021). Traditional pedagogical frameworks frequently adopt deficit-oriented perspectives toward linguistic diversity, often perceiving multilingualism as a barrier rather than as a cognitive resource. This stance results in classroom practices that marginalize rather than embrace learners' linguistic and cultural repertoires, ultimately limiting students' cognitive and academic potential (García & Wei, 2014). Therefore, shifting from traditional deficit-focused educational models toward strength-based, neuroeducation-informed multilingual approaches is imperative for fostering inclusive, cognitively enriching educational environments (Kroll & Bialystok, 2013).

Recent neuroeducational research provides compelling evidence supporting multilingualism's role in enhancing learners' cognitive flexibility and adaptive problem-solving skills (Poarch & Krott, 2019). For instance, Bialystok (2017) reports that bilingual and multilingual students typically demonstrate stronger inhibitory control, allowing them to selectively attend to relevant information while efficiently suppressing distractors—skills closely tied to academic performance and learning outcomes. Additionally, Kroll and Dussias (2017) emphasize multilingualism's positive influence on cognitive flexibility, which enables learners to rapidly shift between different linguistic and cognitive tasks, thus improving their adaptability within diverse educational contexts. Moreover, the cognitive benefits associated with multilingualism extend beyond childhood and adolescence, contributing to lifelong learning and cognitive health. Neuroscientific findings suggest that multilingualism may delay the onset of age-related cognitive decline, providing a sustained advantage across the lifespan (Bak, Nissan, Allerhand, & Deary, 2014; Craik, Bialystok, & Freedman, 2010). Such longitudinal cognitive advantages underscore multilingualism's broader relevance, highlighting the importance of adopting neuroeducational strategies to foster sustained cognitive development throughout an individual's educational trajectory.

Implementing neuroeducation-informed multilingual strategies requires educational practitioners to recognize multilingualism as a valuable cognitive resource, encouraging pedagogical methods such as translanguaging and

integrative language practices (García & Wei, 2014). Translanguaging involves the strategic use of learners' entire linguistic repertoires to enhance cognitive engagement, facilitating deeper conceptual understanding and critical thinking (Antoniou, 2019). Neuroscience-based evidence supports translanguaging practices by indicating that engaging multiple language systems simultaneously recruits extensive neural networks, thus amplifying cognitive processing capacities (Li et al., 2014). Despite the promise of neuroeducation-informed multilingual strategies, several barriers hinder their effective implementation within educational contexts. Predominantly, educators frequently lack sufficient professional training in neuroscience-informed multilingual pedagogies, limiting their capability to translate neuroscientific findings into practical classroom applications (Dubinsky et al., 2013). Furthermore, prevailing educational policies, curriculum frameworks and institutional attitudes toward linguistic diversity often perpetuate deficit-based views, creating systemic resistance to adopting innovative multilingual instructional strategies (Cummins, 2021). Addressing these challenges necessitates targeted professional development initiatives and policy interventions, fostering interdisciplinary collaboration among neuroscientists, educational researchers, policymakers and educators (Thomas et al., 2019).

The present study aims to address this critical research gap by exploring neuroeducational insights into cognitive enhancement through multilingual practices. Specifically, this study seeks to identify neuroscience-informed educational strategies capable of leveraging multilingual learners' enhanced cognitive skills, thereby improving academic performance and promoting inclusive educational environments. By synthesizing findings from cognitive neuroscience and multilingual education research, this study offers practical implications and strategic recommendations for educators to effectively integrate multilingualism as a cognitive asset in classroom settings. The intersection of neuroeducation and multilingualism presents transformative potential for educational practice, promoting cognitive enrichment, academic achievement and inclusivity within linguistically diverse classrooms. Through critical engagement with existing neuroscientific literature, educational theories and pedagogical practices, this study underscores the importance of adopting interdisciplinary, evidence-based approaches to multilingual education, ultimately contributing to enhanced cognitive development and sustained academic success among diverse student populations.

## Significance of the Study

The significance of this study lies in its capacity to bridge neuroscience and educational practice, specifically by illuminating how multilingual experiences enhance cognitive functioning in learners. By synthesizing neuroeducational insights with multilingual strategies, the study contributes to transforming conventional classroom practices that often marginalize linguistic diversity into more inclusive and cognitively enriching environments. Additionally, the findings offer educators practical, evidence-based approaches to leverage multilingualism as a pedagogical asset, thereby potentially improving student academic achievement and cognitive development. Ultimately, this research addresses existing gaps in teacher training and curriculum design, promoting interdisciplinary collaboration that may enhance educational policy and practice, fostering positive outcomes for linguistically diverse student populations.

## Methodology

The study employed a qualitative research approach, specifically adopting a systematic literature review method to investigate neuroeducational insights into cognitive enhancement through multilingual practices. Data collection involved a comprehensive search of scholarly literature, utilizing electronic databases such as ERIC, Google Scholar, PsycINFO, PubMed, Web of Science and Scopus, covering publications from 2010 to 2024. Search terms included combinations like "neuroeducation," "multilingualism," "cognitive enhancement," "neuroscience and education," and "multilingual cognitive benefits." Inclusion criteria were set to select peer-reviewed journal articles, scholarly books and conference proceedings directly relevant to the intersection of neuroscience, multilingual education and cognitive psychology. Thematic analysis was used to identify, categorize and interpret key findings, ultimately providing an integrative synthesis of neuroeducational strategies suitable for multilingual educational contexts.

## Objectives of the Study

A. To explore neuroeducational insights on cognitive enhancement associated with multilingual practices in educational settings.

B. To identify neuroscience-informed educational strategies that effectively leverage multilingual learners' cognitive advantages.

C. To provide practical pedagogical recommendations for integrating multilingualism into classroom teaching based on neuroscientific evidence.

**Findings of the Study**

**A. Neuroeducational Insights on Cognitive Enhancement Associated with Multilingual Practices in Educational Settings**

The systematic review of literature revealed several neuroeducational insights linking multilingualism with enhanced cognitive functioning in educational contexts. First, multilingual learners demonstrated superior executive functioning, particularly in areas of cognitive flexibility, inhibitory control and working memory (Bialystok, 2017; Poarch & Krott, 2019). Neuroscientific studies attributed these advantages to multilingual individuals' frequent engagement in complex linguistic tasks, such as language switching and managing competing linguistic systems, resulting in improved neural efficiency and adaptability (Abutalebi & Green, 2016). Second, multilingual experiences were associated with increased **neuroplasticity**, evidenced by structural and functional adaptations in brain regions crucial for cognitive control, including the prefrontal cortex, anterior cingulate cortex and basal ganglia (Li, Legault, & Litcofsky, 2014; Luk & Pliatsikas, 2016). Enhanced connectivity between these regions suggests that regular multilingual practices strengthen neural pathways essential for higher-order cognitive processes like problem-solving, abstract reasoning and attention regulation (Li & Grant, 2016). Lastly, from an educational perspective, adopting neuroeducation-informed practices such as translanguaging and integrated language instruction allowed learners to actively leverage their multilingual abilities, resulting in greater cognitive engagement, deeper conceptual understanding and overall improved academic outcomes (Antoniou, 2019; García & Wei, 2014). These findings collectively highlight the importance of recognizing multilingualism as a valuable cognitive asset in educational settings, emphasizing neuroscience-informed instructional strategies for optimized learning experiences.

**B. Neuroscience-informed Educational Strategies Leveraging Multilingual Learners' Cognitive Advantages**

The study identified several neuroscience-informed educational strategies effective in leveraging cognitive advantages of multilingual learners. First, implementing translanguaging—the strategic use of learners' full linguistic

repertoires—supports enhanced cognitive engagement by activating broader neural networks, thus facilitating deeper conceptual understanding and improved executive functioning (García & Wei, 2014; Li et al., 2014). Second, task-based multilingual instruction, which encourages language switching and cognitive flexibility through authentic tasks, reinforces neural adaptability and executive control, capitalizing on the cognitive benefits associated with multilingual experiences (Antoniou, 2019). Finally, integrating explicit instruction focused on enhancing executive functions, such as structured cognitive training activities targeting working memory, inhibitory control and attentional regulation, strengthens multilingual learners' underlying cognitive skills and enhances overall academic achievement (Bialystok, 2017; Poarch & Krott, 2019). These neuroscience-informed strategies collectively provide educators with evidence-based approaches to maximize the cognitive potential inherent in multilingual classrooms.

### C. Practical Pedagogical Recommendations for Integrating Multilingualism into Classroom Teaching Based on Neuroscientific Evidence

- **Adopt Translanguaging as a Core Pedagogical Strategy**- Encourage students to draw upon their entire linguistic repertoire when engaging with academic content. Translanguaging not only affirms linguistic identities but also enhances cognitive flexibility by activating multiple neural pathways associated with language processing and executive control (García & Wei, 2014; Li et al., 2014).

- **Design Task-Based Multilingual Activities**- Create classroom tasks that require students to switch between languages or solve problems in different linguistic contexts. This taps into the bilingual advantage by reinforcing cognitive functions such as attention-shifting, working memory and inhibitory control (Bialystok, 2017; Antoniou, 2019).

- **Integrate Executive Function Training into Curriculum**- Embed

  exercises that enhance working memory, self-regulation and attentional control—skills that are naturally strengthened in multilingual individuals. Activities like dual-language puzzles, memory games and attention-control tasks can further reinforce these functions (Poarch & Krott, 2019).

- **Promote Metacognitive Reflection in Multiple Languages**- Encourage students to reflect on their thinking processes using both their first language (L1) and second language (L2). This dual-language metacognitive approach strengthens neural connectivity and supports deeper learning and self-awareness (Kroll & Bialystok, 2013).
- **Utilize Multilingual Scaffolding Techniques**- Provide instructional support such as bilingual glossaries, dual-language resources and peer collaboration in multiple languages to lower cognitive load and allow students to process complex content more effectively (Luk & Pliatsikas, 2016).
- **Celebrate Linguistic Diversity in the Classroom**- Foster an inclusive environment where multiple languages are visible and valued. Neuroscience supports the idea that positive emotional engagement, identity affirmation and social belonging enhance brain function and learning outcomes (Li & Grant, 2016; Cummins, 2021).
- **Use Multisensory and Multilingual Teaching Aids**- Employ visual, auditory and kinesthetic materials in multiple languages to stimulate different areas of the brain. This enhances memory retention and concept acquisition by engaging multiple sensory modalities (Dubinsky et al., 2013).
- **Encourage Collaborative Learning Across Languages**- Group students strategically to collaborate using different languages. Such interactions not only build social and cultural competence but also stimulate higher-order cognitive processes involved in bilingual communication and problem-solving (Kroll & Dussias, 2017).

## Discussion of Results

The findings of this study reinforce the growing body of interdisciplinary research suggesting that multilingualism, when viewed through a neuroeducational lens, offers significant cognitive and academic benefits. One of the key insights emerging from the review is the consistent association between multilingualism and enhanced executive functioning, including cognitive flexibility, working memory and attentional control. These functions are critical not only for language processing but also for general academic tasks such as problem-solving, reasoning and sustained focus (Bialystok, 2017; Poarch & Krott, 2019). The neuroscientific evidence points to structural

and functional brain adaptations—particularly in regions such as the prefrontal cortex and anterior cingulate cortex—that occur in response to continuous multilingual language use (Li et al., 2014; Abutalebi & Green, 2016). This study also revealed that neuroplasticity is a central mechanism underlying these cognitive advantages. Regular engagement in multilingual practices appears to reorganize and strengthen neural networks involved in both language and executive control. Such findings are particularly important in educational contexts, as they suggest that multilingual students are neurologically equipped to manage complex learning environments, provided their cognitive assets are recognized and supported. Despite these advantages, the study found that traditional educational systems often fail to capitalize on this potential due to persistent monolingual ideologies and a lack of neuroscience-informed instructional practices. Teachers may inadvertently suppress students' linguistic resources, thereby limiting cognitive engagement and learner identity development (Cummins, 2021). This underscores the importance of shifting pedagogical approaches to those that are more inclusive and brain-compatible. The educational strategies identified in the study—such as translanguaging, task-based multilingual instruction and executive function training—emerged as promising tools for leveraging the cognitive strengths of multilingual learners. These approaches align with neuroscientific evidence indicating that cognitive stimulation across languages enhances brain function and academic performance. Moreover, the use of translanguaging, in particular, was found to engage broader neural pathways, supporting both linguistic expression and conceptual understanding (García & Wei, 2014). Importantly, the discussion also highlights the practical challenges of implementation. While the strategies are grounded in research, their success depends heavily on teacher awareness, training and systemic support. Without professional development opportunities and curriculum frameworks that endorse multilingualism, the benefits identified by neuroscience may remain underutilized in actual classroom settings (Dubinsky et al., 2013; Thomas et al., 2019). The discussion of results affirms that multilingualism is not only a linguistic asset but also a powerful cognitive resource. When supported by neuroscience-informed pedagogical strategies, multilingual learners can thrive academically and cognitively. However, realizing this potential requires intentional shifts in teacher practice, curriculum design and educational policy that fully embrace the insights of neuroeducation.

## Conclusion

The study highlighted the profound intersection between neuroeducation and multilingualism, emphasizing how multilingual experiences contribute to cognitive enhancement through neuroscientifically supported mechanisms such as increased neuroplasticity, improved executive functioning and strengthened neural connectivity. Drawing from empirical research, it became evident that multilingual learners possess unique cognitive advantages that, when effectively harnessed, can lead to improved academic outcomes and deeper conceptual understanding. However, these benefits are often underutilized in traditional educational settings due to prevailing monolingual norms and a lack of neuroscience-informed pedagogical awareness. By identifying and advocating for neuroscience-informed strategies—such as translanguaging, task-based learning, executive function training and multilingual scaffolding—this study offers practical, evidence-based recommendations for integrating multilingualism into classroom teaching. These strategies not only enhance cognitive engagement but also foster inclusive, affirming learning environments where linguistic diversity is viewed as an asset rather than a challenge. Ultimately, the study reinforces the need for educators, curriculum designers and policymakers to reframe multilingualism through a neuroeducational lens, enabling more effective, equitable and cognitively enriched educational experiences for all learners in an increasingly globalized and linguistically diverse world.

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**11**

# Thematic Analysis of Parental Involvement and Its Impact on Social Science Learning Among Tribal and Non-Tribal Girls in West Bengal

## Abstract

*This study examines the impact of parental involvement on the academic outcomes of secondary school girls from tribal and non-tribal backgrounds in West Bengal, India. Through thematic analysis, key themes were identified, highlighting distinct challenges faced by tribal parents, including limited educational backgrounds and time constraints due to agricultural work. In contrast, non-tribal parents exhibited higher levels of engagement, leading to enhanced student motivation and performance. The findings reveal that parental involvement significantly influences students' interest in subjects like social science, with varying degrees of effectiveness based on the parents' educational familiarity and resources. The study underscores the importance of active parental engagement in fostering academic success, particularly for tribal students, who encounter greater challenges. To address educational disparities, targeted interventions are recommended to enhance parental involvement, improve resource access, and implement culturally sensitive support strategies, aiming to create a more equitable educational environment for all students.*

***Keywords:*** *Academic Outcomes, Educational Disparities, Girls' Students, Resource Availability*

## Introduction

The relationship between parental involvement and academic performance is well-established but complex. While generally positive, the effects of parental engagement, ranging from direct academic support to participation in school events (Wilder, 2013), vary across different cultural and socio-economic contexts. Research shows that parental involvement impacts academic performance differently for various demographic groups (Yan and Lin, 2005) and that higher parental education levels often correlate with better academic outcomes (Yulianti et al., 2023). However, some studies report no significant or even negative effects of parental involvement (Coleman and McNeese, 2009), highlighting methodological inconsistencies in the field (Erdem and Kaya, 2020). Similarly, while student interest is generally linked to better academic performance (Kpolovie et al., 2014), exceptions exist (Wong and Wong, 2019), and socio-economic factors significantly influence this relationship (Radhika and Nivedha, 2020). This study aims to clarify these inconsistencies by examining the effects of parental involvement and student interest across diverse contexts and providing actionable recommendations for educators.

## Review of Literature

Parental involvement is pivotal in shaping academic performance, positively influencing motivation, performance, and reducing dropout rates across various groups (Barnard, 2004). However, its impact varies significantly across socio-economic and cultural contexts, particularly between tribal and non-tribal communities (Singh & Banerjee, 2019). Tribal students, especially girls, face unique challenges such as economic constraints, cultural barriers, and limited access to educational resources, contributing to higher dropout rates and lower academic performance (Gogoi, 2016).

In contrast, non-tribal parents often engage more actively due to better socio-economic conditions and familiarity with educational systems, leading to improved outcomes for their children (Cashman et al., 2021). Research also suggests that the type and quality of parental involvement—home-based versus school-based—significantly influences academic outcomes, but this varies across contexts (Yulianti et al., 2018).

Despite extensive studies, gaps remain in understanding how parental involvement differs between tribal and non-tribal communities in rural India and its nuanced impact on secondary school girls. Limited research explores

the intersection of cultural, economic, and educational factors specific to tribal students, leaving questions about effective, culturally sensitive strategies to bridge these disparities. This study addresses these gaps by examining the comparative impact of parental involvement on tribal and non-tribal girls in Paschim Medinipur District, West Bengal.

## Methodology

This is a qualitative study that investigated secondary school girls' experiences and perspectives on parental involvement and its educational impact through focus group discussions (FGDs) conducted from June 2023 to May 2024 in the tribal-dominated blocks of Paschim Medinipur District, West Bengal, India.

Purposive sampling was used to select 20 Focus Group Discussions (FGDs), with an equal number of groups comprising tribal and non-tribal girls. Each group consisted of 8-10 ninth-grade students from local secondary schools. Participants were chosen based on specific study criteria, and consent was obtained from both the students and their guardians.

Data were collected through FGDs lasting 60-90 minutes, held in neutral settings like schools or community centres. A trained facilitator used a semi-structured guide, and discussions were audio-recorded with detailed notes taken. The guide covered parental involvement, challenges, and impacts on academic interest and performance. Thematic approaches were used. Transcriptions were reviewed to generate initial codes and broader themes.

## Results

### *Research questions-based outcomes from FGDs*

***Research question 1:*** How do the levels and nature of parental involvement differ between tribal and non-tribal secondary girls' students?

A group of tribal students gathered in their schoolyard, discussing their experiences with their parents and teachers. Meera, one of the students, shared how her mother felt nervous whenever they had to meet her teachers. *"My parents didn't go to school for long, so they feel shy talking to my teachers,"* Meera said. Her mother's discomfort often meant they missed out on important updates about her academic progress.

In contrast, non-tribal students like Aarti enjoyed more active parental involvement. Aarti's parents were frequently seen chatting with her teachers during school events. *"My parents talk to my teachers all the time,"* Aarti said. *"They don't feel awkward because they know what's expected and can follow what's being said."* Despite their busy schedules, non-tribal parents seemed more confident and comfortable navigating the school environment, providing a stark contrast to the hesitancy observed among tribal parents.

***Research question 2:*** What factors influence the degree of parental involvement in the education of tribal versus non-tribal secondary girls' students?

Ravi, a tribal student, explained how the demanding nature of his parents' agricultural work left little time for involvement in his education. *"My parents are always in the fields. They don't have time to talk about school or help me with my studies,"* Ravi said. Their limited educational background also contributed to their feelings of inadequacy, making them hesitant to engage with school authorities.

On the other hand, non-tribal students like Priya experienced a different reality. Priya's parents, both with higher levels of formal education, were actively involved in her schooling. They frequently attended parent-teacher meetings and offered help with her homework. *"My parents know how to talk with teachers,"* Priya noted, highlighting their familiarity with the educational system and their ability to provide direct academic support.

***Research question 3:*** How does the level of parental involvement impact the Social Science interest of tribal and non-tribal secondary girls' students?

Tribal student Rani felt isolated due to her parents' limited involvement. *"Sometimes I feel like I'm on my own when it comes to school,"* Rani confessed. Her parents' discomfort and infrequent communication with teachers contributed to a lack of support, affecting her interest in subjects like Social Science. The feeling of isolation often translated into a lack of motivation to engage deeply with her studies.

Conversely, non-tribal student Ananya found her parents' involvement to be a source of encouragement. Her parents frequently discussed her academic progress with her teachers and supported her interest in Social Science. *"My parents always ask how I'm doing in school,"* Ananya said. Their active engagement fostered a strong interest in academic subjects, making her more motivated and enthusiastic about learning.

***Research question 4:*** How do tribal and non-tribal secondary girls' students perform in Social Science, and what factors contribute to any observed differences?

Sita, a tribal student from a remote village, struggled with her Social Science performance. Despite receiving a scholarship, she faced difficulties in obtaining essential study materials. *"We got the scholarship, but buying books and other things is still hard,"* Sita explained. The lack of resources and parental support impacted her ability to keep up with the curriculum, contributing to her lower performance in Social Science.

In contrast, Neha, a non-tribal student from a well-resourced school, excelled in Social Science. With access to textbooks, tutoring, and active parental support, Neha had the tools she needed to succeed. *"I have all the materials I need for my studies,"* Neha said. Her parents' involvement and the availability of resources created a stable academic environment, leading to better performance in Social Science.

***Research question 5:*** What is the relationship between parental involvement, student interest, and academic performance in Social Science among tribal and non-tribal secondary girls' students?

In the tribal village of Garhbeta II (Community Development Block), student Lakshmi found her academic performance in Social Science to be intertwined with the level of parental involvement. Her parents' limited engagement and discomfort with the school system affected her interest in the subject. *"When I don't have the right materials, I feel left out and like I can't do as well as others,"* Lakshmi shared. This lack of support not only impacted her academic performance but also diminished her enthusiasm for Social Science.

In a stark contrast, non-tribal student Rhea thrived academically due to the strong relationship between parental involvement and her interest in Social Science. *"My parents are always involved in my education,"* Rhea said. Their active participation and support nurtured her interest and contributed to her academic success in Social Science.

***Research question 6:*** What is the joint contribution of parental involvement and student interest to the academic success of tribal and non-tribal secondary girls' students in Social Science?

In the tribal area of Narayangarh (Community Development Block), student Sunita faced challenges in her academic journey due to the combined effects of limited parental involvement and her own waning interest in Social Science. *"If teachers could make my parents feel more comfortable, maybe by explaining things in a simpler way or being more understanding, I think they would talk more,"* Sunita suggested. Despite her own interest in the subject, the lack of supportive involvement from her parents hindered her academic success.

Meanwhile, non-tribal student Mira experienced the benefits of both strong parental involvement and her own interest in Social Science. *"My parents encourage me to pursue my interests, and they're always there to support my studies,"* Mira said. This supportive environment, coupled with her own enthusiasm, played a significant role in her academic performances, illustrating the positive impact of joint parental involvement and student interest on educational success.

### *Qualitative insights from thematic analysis*

Nature of parental involvement

Figure 1 highlights a clear divide between tribal and non-tribal students in terms of parental involvement. Tribal parents often show hesitation and lack of confidence due to limited educational backgrounds, leading to less active engagement with teachers. In contrast, non-tribal parents, more familiar with the school system, are generally more engaged. Despite these differences, both tribal and non-tribal parents aim to support their children's education, though their effectiveness varies based on their comfort and familiarity with the educational system.

Factors influencing parental involvement

Tribal parents face challenges such as limited education and demanding work schedules, which restrict their involvement. Non-tribal parents, with better access to resources, often use external support like tutors. Both groups face constraints that impact their involvement, but tribal parents' challenges are more related to educational background and time, while non-tribal parents may rely on external resources despite being more familiar with the education system.

Impact on interest in social science

For tribal students, limited parental support often leads to isolation and reduced motivation, negatively impacting their interest in Social Science. Non-tribal students benefit from regular encouragement, enhancing their motivation and interest in the subject. Parental involvement affects interest in Social Science for both groups, but the positive impact is more pronounced for non-tribal students.

Performance in social science

Tribal students face financial and resource constraints, negatively affecting their performance in Social Science. Non-tribal students, with better access to resources and parental support, generally perform better. Performance is influenced by support and resource availability, with tribal students facing more challenges.

Relationship between parental involvement, student interest, and performance

Tribal students experience strained relationships due to limited parental involvement and resources, which affects their performance and interest. Non-tribal students benefit from positive reinforcement and involvement, leading to greater interest and success. The impact of parental involvement is more positive for non-tribal students.

Joint contribution of parental involvement and student interest

For tribal students, socio-economic constraints and discomfort with the educational system limit the combined impact of parental involvement and student interest. Non-tribal students experience significant positive effects from both parental support and personal interest, leading to better academic success. The joint impact is more pronounced for non-tribal students due to fewer constraints and higher engagement.

### *Network analysis based on a thematic approach*

Table 1 and Figure 1 show that parental involvement directly influences levels of support and relationships, affecting challenges, resource availability, and ultimately academic success. Factors like hesitation vs. comfort and educational background vs. familiarity play critical roles in determining parental involvement and its effectiveness. Time constraints and familiarity with the education system significantly impact the level of involvement and student outcomes.

**Table 1 – In-depth network analysis based on the findings from the thematic approach.**

| From node | To node | Nature of relationship | Details | Implication | Sign |
|---|---|---|---|---|---|
| Parental involvement | Lack of support vs. Encouragement | Influences | Parental involvement shapes the level of encouragement and support given to students. | Higher parental involvement generally leads to more encouragement. | → |
| Parental involvement | Strained relationships vs. Positive reinforcement | Influences | The level of parental involvement affects the quality of relationships with teachers and the nature of reinforcement. | Positive reinforcement is more likely with higher involvement. | → |
| Hesitation vs. Comfort | Lack of support vs. Encouragement | Affects | Hesitation due to a lack of education may reduce the level of support and encouragement parents provide. | Hesitant parents may offer less support, impacting student motivation. | → |
| Educational background vs. Familiarity and resources | Strained relationships vs. Positive reinforcement | Affects | Parents' educational background influences their comfort and effectiveness in interacting with teachers. | Parents with higher educational backgrounds tend to have better interactions. | → |
| Lack of support vs. Encouragement | Challenges and limitations vs. Support and resource availability | Impacts | Lack of support leads to increased academic challenges and limitations in accessing resources. | Low support can exacerbate difficulties in performance. | → |
| Strained relationships vs. Positive reinforcement | Challenges and limitations vs. Support and resource availability | Impacts | Poor relationships and low reinforcement result in reduced resource availability and increased challenges. | Positive relationships improve access to resources and reduce challenges. | → |
| Challenges and limitations vs. Support and resource availability | Limited vs. Significant positive impact | Contributes Influenced by | The level of support and resources available directly affects the extent of positive academic impacts. | Better support and resources lead to greater positive impacts. | → |

| | | | | | |
|---|---|---|---|---|---|
| Parental involvement | Educational background and time constraints (tribal) | Influenced by | Tribal context, including limited educational background and time constraints, affects parental involvement. | Parental involvement may be less due to these constraints. | ⇦ |
| Parental involvement | Educational familiarity and resources (non-tribal) | Affects | Non-tribal contexts with more educational familiarity and resources lead to higher parental involvement. | Higher involvement is typically observed in non-tribal contexts. | ⇦ |
| Educational background | Parental involvement | Affects | Parents' educational background influences their ability to be involved in their children's education. | Better educational background often results in higher involvement. | → |
| Time constraints | Parental involvement | Affects | Limited time available due to work or other responsibilities reduces the level of parental involvement. | Time constraints often lead to reduced parental involvement. | → |
| Familiarity with the education system | Parental involvement | Affects | Greater familiarity with the education system enhances the ability of parents to be involved. | Increased familiarity often results in higher parental involvement. | → |
| Resource availability | Impact on performance | Affects | The availability of resources impacts students' academic performance directly. | More resources lead to better performance. | → |
| Resource availability | Impact on student interest | | Access to resources influences students' interest in their studies. | Greater resource availability can enhance student interest. | → |

**Note**

- **Nature of Relationship:** Defines the type of interaction between the nodes, such as influence, affect, or impact.
- **Details:** Provides specific insights into how the relationship operates.
- **Implication:** Describes the potential outcomes or effects of the relationship on students and parental involvement.

**→:** Indicates a direct, positive influence where an increase or improvement in the **From Node** leads to an increase or improvement in the **To Node**.

⇦**:** Indicates an influence from the **To Node** on the **From Node**, or a bidirectional relationship where the **To Node** impacts the **From Node**.

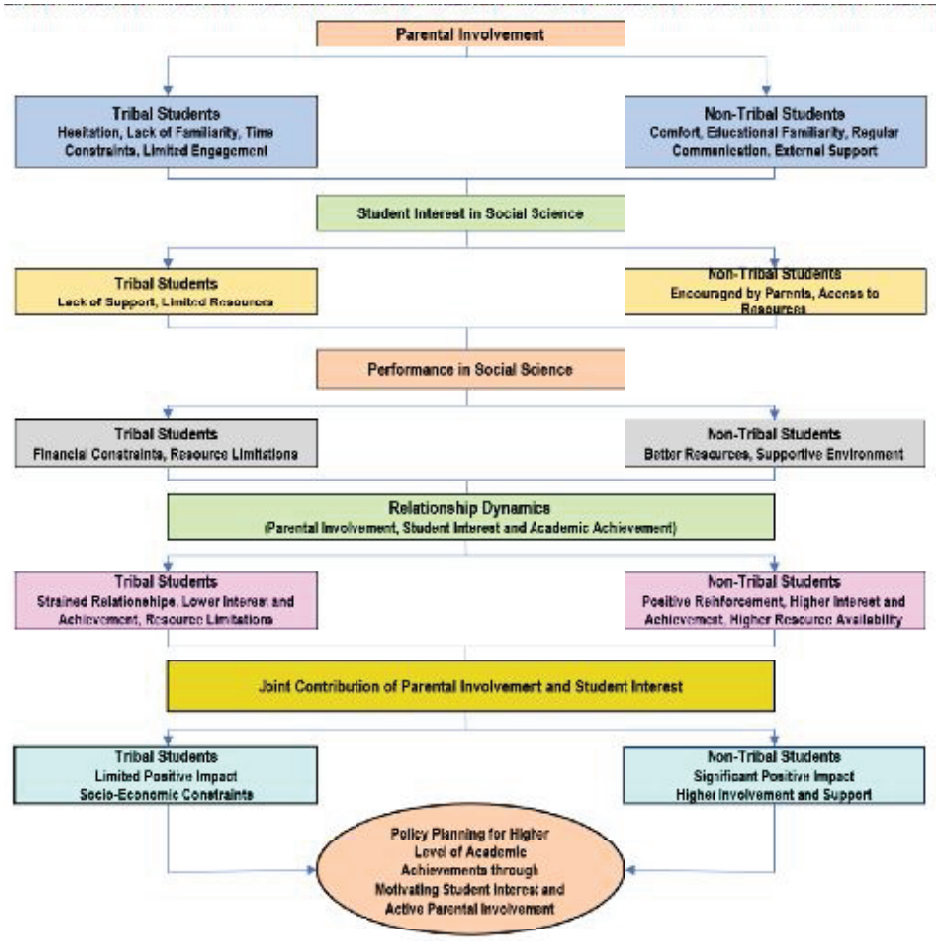


**Figure 1: Representation of the network analysis based on findings from the thematic approach.**

## Discussion

Parental involvement plays a critical role in shaping academic outcomes, revealing distinct challenges for tribal and non-tribal parents. Tribal parents often encounter barriers such as limited education and time constraints from agricultural work, which diminish their engagement and negatively impact their children's motivation and performance (Jeynes, 2003). In contrast, non-tribal parents, benefiting from higher education and better resources, demonstrate greater confidence and involvement, fostering enhanced student interest and success (Wang and Sheikh-Khalil, 2014). Research emphasizes that higher

parental education correlates with increased involvement, positively affecting academic performance (Jeynes, 2022). Educated parents are more likely to engage with teachers and support their children's learning, leading to improved academic results (Levinthal de Oliveira Lima and Kuusisto, 2020). Tribal students, however, face significant challenges due to limited resources and support, exacerbating educational disparities and contributing to lower academic success compared to their non-tribal peers (Wang and Sheikh-Khalil, 2014). Active parental engagement, including effective communication with teachers and fostering a supportive home environment, is essential for boosting student motivation and achieving better outcomes (Jeynes, 2022). Addressing these disparities requires targeted interventions to enhance parental involvement, particularly in tribal communities.

## Conclusion

The analysis highlights significant disparities in academic outcomes between tribal and non-tribal secondary girls' students, driven by differences in parental involvement, educational background, and socio-economic factors. Tribal parents often struggle with limited education and demanding work schedules, which hinder their engagement in their children's education and contribute to lower student motivation and performance. In contrast, non-tribal parents benefit from higher educational levels and better resource access, leading to more effective support and improved academic success for their children. Socio-economic constraints exacerbate these challenges, reinforcing a cycle of educational disparity. Addressing these issues requires targeted interventions to enhance parental involvement, increase resource availability, and implement culturally sensitive support strategies, aiming to foster a more equitable educational environment and improve outcomes for all students.

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**12**

# Exploring the Impact of Social Media Addiction on Students' Learning Strategies, Engagement, and Academic Performance

## Abstract

*This paper investigated the impact of social media addiction on students' learning strategies, engagement and academic performance, highlighting a growing concern in educational settings. With the widespread use of social media platforms among young individuals, research has increasingly indicated that excessive use negatively affected students' cognitive functions, time management and concentration, all of which are vital for effective learning. The primary objectives of this study were to analyze the relationship between social media addiction and students' learning strategies, assess its effect on student engagement in academic contexts and examine how these factors together influenced academic performance. The review synthesized existing literature to offer insights into how social media addiction altered students' study habits, often resulting in fragmented attention and diminished academic productivity. Also, it explored the complex relationship between social media use and student engagement in both traditional classroom settings and online learning environments. It was found that addiction to social media often led to a decline in meaningful academic interactions, reduced participation in educational activities and fostered passive learning behaviors, ultimately compromising students' overall academic achievements. This research aimed to clarify the intricate dynamics of social media addiction and its far-reaching impact on educational outcomes.*

***Keywords:*** *Social Media Addiction, Learning Strategies, Student Engagement, Academic Performance*

## Introduction

Social media addiction has emerged as a significant concern in contemporary education, particularly among students who increasingly rely on digital platforms for communication, information and entertainment (Kuss & Griffiths, 2017). The pervasive use of social media has been linked to various negative academic outcomes, including decreased motivation, increased procrastination and reduced focus on academic tasks, which collectively compromise students' educational experiences (Junco, 2012). Excessive engagement with social media often leads to a decline in students' cognitive functions, such as attention and memory, which are crucial for effective learning (Dhanesh & Dhir, 2020). Research shows that students frequently switching their attention between academic responsibilities and social media interactions may experience diminished deep engagement with learning materials. This fragmented attention can impair critical thinking skills and problem-solving abilities, essential components of successful academic achievement (Baker et al., 2016). Social media addiction can also negatively impact students' time management, leading them to allocate insufficient time to studying and completing assignments (Rivadeneyra et al., 2007). In addition to cognitive and motivational effects, social media usage plays a crucial role in shaping student engagement within academic contexts. Students who exhibit higher levels of social media addiction often demonstrate reduced participation in classroom discussions and collaborative learning activities, which are vital for creating a productive learning environment (Sinha & Vohra, 2020). This disengagement can lead to lower academic performance and a lack of fulfillment of their educational potential. By examining the existing literature on social media addiction and its implications for students' learning strategies, engagement and academic performance, this review aims to provide a comprehensive understanding of how social media impacts educational outcomes in today's digital age.

The review of related literature on social media addiction and its impact on students' learning strategies, engagement and academic performance reveals a complex interplay between excessive social media use and educational outcomes. Numerous studies indicated that social media addiction correlates with diminished academic motivation and increased procrastination, often resulting in lower grades and overall academic performance (Junco, 2012). Research suggested that students who frequently engage with social media platforms struggle with attention deficits and reduced cognitive engagement, which are critical for effective learning (Dhanesh & Dhir, 2020). Social media

platforms are designed to maximize user engagement through notifications and feedback mechanisms, which can lead to compulsive use and distract students from their academic responsibilities (López-Fernández et al., 2019). Also, excessive social media use can disrupt time management skills, leading to poor study habits and insufficient time dedicated to academic tasks (Rivadeneyra et al., 2007). Studies have shown that high levels of social media engagement hinder students' participation in classroom discussions and collaborative learning activities, which are essential for fostering a productive learning environment (Sinha & Vohra, 2020). Social media can create an illusion of social connection while simultaneously isolating students from face-to-face interactions, impacting their social skills and emotional well-being (Primack et al., 2017). The literature underscores the pressing need for educational stakeholders to address social media addiction as a significant factor influencing students' academic experiences and outcomes. Strategies that promote healthier engagement with digital platforms are essential, including digital literacy education, awareness campaigns and interventions aimed at encouraging balanced media consumption.

**Significance of the study**

The significance of this study lies in its potential to provide valuable insights into the relationship between social media addiction and students' learning strategies, engagement and academic performance. Understanding the implications of social media use is crucial as educational institutions increasingly integrate technology into the learning environment. As social media platforms become ubiquitous among students, recognizing their impact on academic success can guide educators and policymakers in developing effective strategies to mitigate negative consequences (Kuss & Griffiths, 2017). This study aims to contribute to the existing body of literature by highlighting the detrimental effects of social media addiction on critical cognitive functions, such as attention and memory, which are essential for effective learning (Dhanesh & Dhir, 2020). The findings will be significant for enhancing student engagement, as previous research has indicated that social media can either facilitate or hinder participatory learning experiences. By addressing the challenges posed by social media addiction, this study seeks to inform educational practices and promote healthier digital habits among students, ultimately fostering improved academic performance and overall well-being (Rivadeneyra et al., 2007). The outcomes of this research can also provide a foundation for further investigations into digital literacy and media consumption habits, leading to the development

of targeted interventions that support students in balancing their academic responsibilities with social media engagement (Sinha & Vohra, 2020).

## Objectives of the study

- **To examine the relationship between social media addiction and students' learning strategies**.
- **To assess the impact of social media addiction on student engagement**.
- **To explore the perceived effects of social media addiction on academic performance**.

## Methodology of the study

This study employs a qualitative research methodology based solely on a comprehensive review of existing literature to investigate the impact of social media addiction on students' learning strategies, engagement and academic performance. Current research emphasizes the adverse effects of excessive social media use on cognitive functions such as attention, focus and time management, which are essential for effective learning (Kuss & Griffiths, 2017). Studies highlight how students' addiction to social media interferes with their learning strategies by fragmenting attention and reducing their ability to concentrate for extended periods, leading to a decline in academic productivity (Dhanesh & Dhir, 2020). Research by Junco (2012) shows that while social media platforms can promote engagement in some educational contexts, excessive use often hinders meaningful participation in academic activities and fosters passive learning behaviors. Furthermore, the review reveals recurring themes in studies that link social media addiction to decreased student engagement and lower academic performance, often resulting in lower grades and an inability to meet academic demands (Sinha & Vohra, 2020). Through this methodical review of literature, the study consolidates existing findings and offers educators and policymaker's valuable insights into the detrimental effects of social media addiction on students' academic success, urging the development of strategies to address these challenges in educational environments.

## Findings and discussion of the study

**Objective 1: To examine the relationship between social media addiction and learning strategies:** The relationship between social media addiction

and learning strategies reveals significant challenges for students, as excessive use of social media tends to disrupt effective study habits and cognitive engagement. The following points highlight the findings from various studies:

- **Increased Distraction and Reduced Focus:** Research by Junco (2012) indicated that students who reported high levels of social media addiction often struggled to maintain focus during study sessions. For example, students admitted that notifications from social media platforms frequently interrupted their study time, leading to fragmented attention and inefficient learning strategies.

- **Shallow Learning Approaches:** Students who are heavily engaged with social media often tend to adopt more superficial learning approaches. Rather than deeply engaging with study materials, many report skimming content quickly, which negatively impacts their comprehension and long-term retention of academic information.

- **Dependency on Social Media for Information**: An increasing number of students demonstrate a tendency to rely heavily on social media platforms as primary sources of academic information, often at the expense of traditional and more credible academic resources. This growing dependence on informal and user-generated content can result in incomplete understanding and reduced critical engagement with course material, potentially leading to significant gaps in knowledge.

- **Impacts on Time Management:** Social media addiction frequently undermines students' ability to manage their time effectively. Many students report that excessive use of social platforms disrupts their planned study schedules, resulting in reduced time for focused learning. Consequently, this poor time management negatively influences their overall learning strategies and academic outcomes.

- **Altered Study Habits:** Students indicated that social media usage altered their study habits, often leading to multitasking during study sessions. For instance, Rivadeneyra et al. (2007) found that students frequently alternated between studying and checking social media, which hampered their ability to engage in sustained learning and problem-solving.

- **Decreased Collaboration and Communication:** Excessive social media use may cause students to prefer online interactions over direct, face-to-

face communication. This shift can impair their ability to collaborate effectively in group projects and classroom activities, limiting opportunities to develop essential interpersonal and collaborative learning skills.

- **Impact on Self-Regulated Learning:** Social media addiction can also interfere with students' ability to effectively self-regulate their learning. Students frequently face difficulties in setting clear academic goals and monitoring their own progress, as distractions from social media reduce their focus and disrupt consistent study habits. This leads to less effective learning strategies overall.

**Objective 2. To assess the impact of social media addiction on student engagement:** The impact of social media addiction on student engagement has been a growing concern in recent years, as various studies have revealed its detrimental effects on classroom participation, motivation and overall academic involvement. Excessive use of social media can significantly disrupt students' ability to engage meaningfully in academic settings, both in terms of participation in discussions and collaboration with peers. The following key findings from the literature provide insights into how social media addiction undermines student engagement and academic success.

- **Lower Academic Participation**: Recent studies have shown that excessive use of social media continues to negatively affect students' participation in academic tasks. For instance, Alhazmi and Rahman (2022) found that university students who spent extended hours on platforms like Instagram and TikTok reported reduced participation in academic discussions and delayed assignment submissions. The study highlighted that many students opted for passive scrolling over active involvement in classroom activities.

- **Reduced Focus and Attention**: A growing body of research indicates that excessive social media use can significantly impair students' ability to concentrate on academic tasks. Chen and Yan (2021) observed that frequent engagement with social media during study hours diminishes students' attention span and cognitive processing abilities. The study found that students were more prone to distractions caused by notifications and compulsive checking behaviors, which interrupted the flow of learning and made it difficult for them to stay focused during lectures and self-study sessions.

- **Decreased Motivation for Learning**: Another critical consequence of social media addiction among students is the decline in intrinsic motivation to learn. Siddiqui and Tarafdar (2023) highlighted that students who were highly engaged with social media platforms reported a stronger emotional connection to online feedback such as likes and comments than to academic accomplishments. This shift in motivational focus often resulted in disengagement from studies, with one student remarking, "I get a dopamine rush from reels, not from finishing assignments."

- **Social Isolation in Academic Settings**: Recent research suggests that excessive use of social media can paradoxically lead to feelings of social isolation, despite its intent to foster connectivity. Nguyen et al. (2022) found that students who were highly addicted to social media often experienced reduced real-life social interactions, which negatively impacted their sense of belonging in academic settings. This emotional and social disconnect hindered their ability to collaborate effectively in group activities and engage in shared academic tasks, thereby diminishing their overall classroom participation and engagement.

- **Negative Impact on Classroom Engagement**: Students often reported being physically present in class but mentally disengaged due to constant distractions from social media. This "absent presence" led to lower levels of active participation and interaction with both instructors and classmates.

- **Disrupted Collaborative Learning**: students preoccupied with social media found it challenging to engage in collaborative learning tasks. Their attention was frequently divided between online activities and group assignments, resulting in ineffective teamwork and reduced group engagement.

**Objective 3: To explore the perceived effects of social media addiction on academic performance:** The exploration of perceived effects of social media addiction on academic performance revealed various negative impacts as reported by students and observed in studies. These effects include a range of issues related to grades, time management and the quality of academic work. Key findings include:

- **Lower Academic Achievement:** Social media addiction has been linked to a noticeable decline in academic performance. Students who spend

excessive time on social media often sacrifice valuable study hours, which affects their ability to keep up with coursework and prepare effectively for assessments. The time devoted to scrolling or interacting online frequently replaces time that could be used for academic tasks, resulting in lower grades. As one student reflected, *"I used to get higher grades before I started spending hours on social media every day,"* underscoring the academic trade-off caused by excessive social media use.

- **Procrastination and Missed Deadlines:** Students who are heavily engaged with social media often exhibit increased levels of procrastination, which can lead to the late submission of assignments and frequently missed deadlines. The constant availability of social media platforms serves as a persistent distraction, drawing students away from their academic responsibilities. As a result, tasks are often completed hastily or left incomplete, negatively impacting the quality of academic performance and overall time management.

- **Decline in Study Quality:** Students' study habits and the quality of their academic work have been observed to deteriorate as a result of social media addiction. Frequent shifts in attention from studying to checking social media lead to fragmented concentration and less thorough completion of academic tasks. Many students have reported that "the temptation to check notifications disrupts my concentration during study sessions," highlighting how constant digital interruptions interfere with sustained focus and academic engagement.

- **Impaired Time Management:** Social media addiction has been shown to significantly disrupt students' ability to manage their study time effectively. Students who spend excessive hours on social platforms often struggle to organize their daily schedules, leading to insufficient time for completing academic tasks and preparing for assessments. Rahman and Alghamdi (2023) found that students with high levels of social media use reported frequent difficulty in setting academic priorities and adhering to study plans, which negatively impacted their academic productivity.

- **Increased Stress and Anxiety:** The pressure to remain constantly active and responsive on social media, combined with the demands of academic life, often leads to elevated stress and anxiety among students. Balancing the desire to stay connected online with the need to meet academic

responsibilities can become overwhelming. This ongoing tension may result in emotional exhaustion and reduced academic performance, as students struggle to manage both spheres effectively.

- **Negative Social Comparisons:** Social media platforms often encourage users to compare themselves with others, which can negatively affect students' self-esteem and academic motivation. When students view the achievements and curated successes of their peers online, they may feel inadequate or unaccomplished by comparison. As one student expressed, *"Seeing my friends' achievements online makes me feel like I'm not doing enough and that affects my motivation to study."* Such comparisons can diminish confidence, reduce focus and ultimately hinder academic engagement.

**Discussion:** The findings of this study align with a substantial body of literature suggesting that social media addiction has a detrimental impact on students' learning strategies, engagement and academic performance. Consistent with studies by Alhazmi and Rahman (2022) and Siddiqui and Tarafdar (2023), the results indicate that excessive use of social media leads to decreased motivation, impaired time management and lower academic achievement. Students reported difficulties in concentrating, reliance on superficial learning techniques and a preference for online distractions over academic responsibilities. These outcomes support previous research showing that social media disrupts deep learning and encourages fragmented attention (Chen & Yan, 2021, Nguyen et al., 2022). However, some studies offer a more nuanced perspective. For instance, research by Kirschner and Karpinski (2010) noted that when used intentionally, social media can support collaborative learning and information sharing among peers. Similarly, Greenhow and Lewin (2016) highlighted the potential of educational social networking tools to enhance engagement when integrated purposefully in academic settings. Despite these positive possibilities, the present study underscores that unregulated and compulsive use of social media especially for non-academic purposes tends to outweigh the benefits, leading to procrastination, stress and diminished classroom participation. Therefore, while digital platforms may offer some value when used strategically, the prevailing trend among students leans toward maladaptive use, reinforcing the need for institutional support in developing self-regulated learning habits, digital well-being and mindful technology use.

## Conclusion of the study

The study found that excessive social media use negatively impacts students' learning strategies, academic engagement and performance. Students often prioritized online interactions over academic responsibilities, leading to reduced focus and ineffective study habits. These findings highlight the need for schools to address social media addiction by promoting digital literacy, time management and collaborative learning. Involving parents and incorporating mindfulness practices can further support students in developing healthier online habits. A coordinated effort from educators, parents and policymakers is essential to foster a balanced academic environment that supports student success.

## Educational Implications of the study

The findings of the study underscore the urgent need for educational institutions to take proactive measures in addressing the negative effects of social media addiction on students' academic lives. To foster healthier learning environments and support student success, the following steps are recommended:

1. Introduce digital literacy programs to educate students about the responsible and balanced use of social media and its impact on learning and academic performance.
2. Teach effective time management strategies to help students plan their study schedules, reduce procrastination and minimize distractions caused by social media.
3. Promote active learning approaches such as discussions, hands-on activities and problem-solving tasks to improve classroom engagement and attention.
4. Encourage collaborative learning through group projects and peer interactions to strengthen face-to-face communication and teamwork skills.
5. Provide counseling and support systems to assist students struggling with social media addiction, offering guidance in building healthier online habits.
6. Integrate mindfulness practices like reflection, meditation and self-regulation exercises to help students develop focus and academic discipline.
7. Engage parents through awareness programs and workshops so they can support and monitor their children's social media use at home.

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**13**

# English Language Competence of Government School Teachers of Punjab

## Abstract

*The role of a teacher in current scenario is not concise to deliver knowledge but also, teacher acts as controller, assessor, and facilitator. Effective teaching involves more than just expertise in an academic field but also efficiency to communicate effectively. Specially, the demand for English language competence of teachers is increased in intensity along with the other teaching competencies. The lack of English language competence of subject teachers is the one of the important factors for gradual deterioration of the standard of education. The necessity of the English language communicative competence for the academic teaching staff has been emphasized by various researchers. Therefore, it is quite important to measure the level of English language competence of Mathematics, Science, and Social Science teachers. Therefore, the current study is aimed to examine the level of English language competency of government schoolteachers of Punjab and to study the influence of Educational Qualification on English language competency of schoolteachers. The study adopted a descriptive survey approach. Data was collected through self-developed English language competence assessment test, from randomly selected 120 government school teachers. Majority of teacher were found having the low level of English language competence. In addition to this, educational qualification shows the significant effect on the English language competence of teachers.*

***Keywords:*** *English language competence, EMI, School teachers, and Teacher Education*

## English Language Competence of Government School Teachers of Punjab

Society is trending faster towards various advancements. Almost our every field of life has adored the innovations. Education too is no exception to it. Educational advancements have bought several new concepts in the educational field including individualized learning, computer-based learning, computer assisted learning, blended learning, flipped learning and many more. But the centrality of the vital component in education, that is the teacher, has not shifted. A teacher is the sole component that can highly facilitate the learning process. "A classroom full of students with no teacher would probably not learn much". (Heartel, 2013). The role of a teacher in current scenario is not concise to deliver knowledge but also, he acts as controller, facilitator, and assessor. Effective teaching does not involve more than just expertise in an academic field but also efficiency to communicate effectively. Thus, teachers must have language-specific competencies along with content and pedagogical knowledge. Competence in language is always considered at the forefront, does not matter what their subject area is. Specially the demand for English language competence of teachers is increase in intensity along with the other teaching competencies.

English is a widely spoken language throughout the world. Also, it ranks as the second most spoken language in India, following Hind. Moreover, it is the country's most widely read and written language. (Vijayalakshmi and Babu, 2014). The British people introduced English to India. During the period of their colonization in India, English was the only language that was used as the language of administration. As Indians were totally unfamiliar with the foreign language, British trained Indians in English so that they can appoint them in their trade. Later, in 1835, Thomas Babington Macaulay, President of the General Committee of Public Instruction, in his minute, justified the English language as medium of instructions by saying "a single shelf of a good European library was worth the whole Indian literature". English incidentally became the language of communication and gradually it strengthened its roots in culture and education of India. Even though India has 22 official languages and 270 identifiable mother tongues (Census of India, 2011), still English has become the most widely spoken language in the country.

## Needs and importance of English in education

English is considered a significant foreign language; Indians are increasingly likely to have observed or experienced the advantages of improving their proficiency in it. English is the primary medium of instruction at the university level, and it is taught as a second language at primary and secondary level of education in majority of Indian states. In recent years, there have been a great push in the country to introduce English as a medium of instruction in school education as soon as possible. As per the Eighth All India School Education, NCERT survey, 15.49% schools at primary stage offers English as medium of instruction, whereas 21.08 % schools were offering English as medium at upper primary level and 33.06% schools had English medium at higher secondary level. (8th AlSES, 2009). Due to increasing demand of English medium instructions in urban as well as rural India, the number of schools offering English medium instructions must has increased. Moreover, Adopting a particular language as a medium of instruction in multicultural and multilingual society as in India in a very challenging task. In such situation, providing only English as a medium will be suitable.

English serves as a link language for people moving across regions. It is not only the medium for international communication, rather it also proves helpful in intra-national communication among educated Indians. (Annamalai, 2004). English is the language of acculturation and assimilation with people of other cultures. English is a tool for mobility, economic gains, and social status. The English language has been used as a vehicle by the modern world to communicate its advancements, changes, and innovations. (Khatri, 2019). English is currently the language of the internet. English stands as the most widely used language for web content, with the majority of websites on the internet utilizing it. Consequently, acquiring proficiency in this language grants access to vast amounts of online content that might otherwise remain inaccessible.

## Language proficiency of teachers

The demand for proficiency in English in teachers is increasing day by day due to increase in demands of English medium education. Having complete proficiently in English is not necessary specially for subject teachers, but the teachers need certain level of language proficiency so that they can carry out important aspects of classroom instruction fluently

in English when demanded. Rechard, in his article on 'Competence and Performance in Language Teaching', suggested the following language-specific competencies that a teacher required to teach efficiently in classroom. (Rechard, 2010)

1. A teacher is expected to comprehend the text correctly. Also, he/she must have fluency in using language orally in the class.
2. He/she should be able to provide instructions and explanations accurately.
3. Moreover, he is required to provide accurate examples of words and concepts.
4. He should be able to access and select learning resources.
5. He must have the ability to monitor his/her own writing and speech for correctness.
6. A teacher should be able to provide appropriate feedback for learners.
7. He must be a model for language enrichment experience for learners.

**English Medium instruction in Punjab**

The use of English in privately run schools is far higher than all the governments schools throughout India. All the major subjects except languages are taught in English language in private schools. But now, in government schools too, the demand for English medium instructions is growing attraction of parents as well as students. As instructions in English medium is considered as one of important parameters in quality education. English has been offered as an alternative language of instruction in government schools by the Punjab education department. As per the data released by the board, from the 2018-19 session, along with Punjabi, 14,720 government schools now provide English as an optional medium of instruction.

**Rationale of the study**

Various schools are now offering English medium instruction. Many private schools have now started parallel English medium classes just for the fear of division fall. The rising demand has forced the Punjab school education board to offer English as an optional medium of instruction in public schools. Introducing English seems important for refining the quality of education and

to bridge gap with private schools in the state. Although many factors can contribute to effective implementation of English medium instruction in government schools of Punjab. But a teacher is the sole component that can highly facilitate the learning process. Effective teaching can be possible only if he or she can be able to comprehend and use the language to build reciprocal communication with the students. (Gurefe, 2018). The lack of English language competence of subject teachers can be an important factor for gradual deterioration of the standard of education. The necessity of the English language communicative competence for the academic teaching staff has been emphasized by various researchers. (Jong and Harper, 2005, Rechard, 2010, Ibrahim, 2020 and Antony et. al. 2019). Therefore, it is quite important to measure the level of English language competence of Mathematics, Science, and Social Science teachers. A teacher's qualification can be one of the factors that can affect his language competence. (Ibrahim, 2020; Antony et. al., 2019). Therefore, study also aimed to examine the effect of educational qualification on English language competence of teachers.

## Research question

1. What is the level of English language competency of government schoolteachers of Punjab?

## Objective

1. To study the significant difference in the mean scores of English language competence of trained postgraduates and trained graduate government schoolteachers.

## Hypotheses

1. There is no significant difference in the mean scores of English language competence of trained graduates and trained postgraduate government schoolteachers.

## Operational Definitions

**English Language Competency:** The language competency generally means the ability of person to use a language or understand it with a degree of accuracy that transmit meaning in production and comprehension. In the present study the English language competency will be denoted by the scores obtained by the participants on the English language competency test.

**Educational qualification:** educational qualifications generally denote to degrees, diplomas, or certificate a person has received from a recognized educational body after the successful completion of an education program. In current study, the educational qualification means the graduation degree and post-graduation degree along with B.Ed. or equivalent teacher training program. The teachers with the above qualifications in current study are referred to as trained graduates or trained postgraduate teachers.

**Government School:** The schools that are run by the government are government schools. In current study, the government schools denote to those schools that are fully funded and run by the Department of School Education, Government of Punjab.

**Teachers:** The teachers in current study denote to only those teachers who are teaching mathematics, science, and social science to class 1 to 10 in government schools.

## Methodology

### Design of study

The study employed a survey type of descriptive research.

### Sample

The sample for the study consisted of 120 government School teachers randomly selected through a simple random sampling from two districts of Punjab: Bathinda and Moga.

### Tool

As the study is intended to measure the English language competence of schoolteachers. The researcher has developed the English language competence tool which consisted of total 30 items concerning spelling, tense, comprehension passage, subject terminology, and question framing. The internal consistency of the test, after being administered to 186 secondary school teachers, revealed value .819, which is considered a high value of Spearman-Brown split-half.

### Analysis of result

**Research question 1**. What is the level of English language competency of government school teachers of Punjab?

To study the level of English language competency of government school teachers of Punjab, three levels (Low, moderate, and high) were made based upon the percentile scores on English language competence test. The result is drawn by calculating the number of teachers and percentage of teachers fall under the above-mentioned three levels. The result of the analysis is shown in table 1.1.

**Table 1.1**

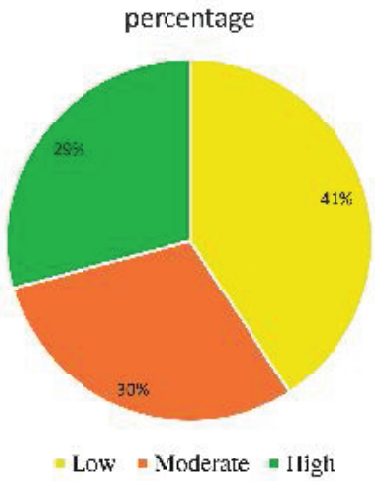
*Number of government school teachers with low, moderate, and high levels of English language competence*

| Levels of English Language competence | Low | Moderate | High | Total |
|---|---|---|---|---|
| Number of teachers | 49 | 36 | 35 | 120 |

From the table 1.1, it is inferred that, 49 teachers out of 120, have low level of English language competence. Whereas 36 teachers fall under the moderate level. 35 teachers out of 120, are found having high level of English Language competence. The percentage wise distribution of levels of English Langauge Competence is shown in figure 1.1.

**Figure 1.1**

*Percentage wise distribution of teachers for three levels of English language competence*



From the above figure it can be inferred that majority of teachers are found having the low level of English language competence. The percentage of teachers that fall under low level of English language competence is 41 percent. Whereas 30 percent of teachers are having moderate English language competence. On the other hand, only 29 percent teachers fall under the high level of English language competence.

**Objective 1**. To study the significant difference in the mean scores of English language competence of trained postgraduates and trained graduate government schoolteachers

The objective was to study the significant difference in the mean scores of English language competence of trained postgraduates and trained graduate government schoolteachers. The Researcher had selected t-test for analysis but before proceeding further, the basic assumptions of parametric tests, i.e., Normality is analyzed with the help of Kolmogorov-Smirnov test of Normality and homogeneity is tested with Levene's test of homogeneity of variance. The result is shown in tables 1.1 and 1.2.

**Table 1.1**

*Result for test of normality*

| Kolmogorov-Smirnov | | | | |
|---|---|---|---|---|
| English language Competence | **Groups** | **Statistic** | **df** | **Sig.** |
| | graduates | .082 | 60 | .200 |
| | postgraduates | .091 | 60 | .200 |

It is observed from the table 1.1 that for the distribution of scores of trained graduate government school teachers for English language competence, the statistic value is .082 with df 60, for which the p-value .200, which is greater than 0.05. Therefore, it is not significant. Hence the null hypothesis "The scores of trained graduate government school teachers for English language competence are distributed normally" is not rejected. Therefore, it can be concluded that the scores of trained graduate government school teachers for English language competence are distributed normally.

Moreover, for the distribution of scores of trained postgraduate government school teachers for English language competence, the statistic value is .091 with df 60, for which the p-value .200, which is also greater than 0.05.

Therefore, it is not significant. Hence the null hypothesis "The scores of trained postgraduate government school teachers for English language competence are distributed normally" is not rejected. Therefore, it can be concluded that the scores of trained postgraduate government school teachers for English language competence are distributed normally.

As the distribution of scores of English language competence of trained graduates and postgraduate government teachers are distributed normally, the basic assumptions of parametric tests that the scores should be distributed, is not violated.

**Table 1.2**

*Test of homogeneity of variance*

| Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|
| .238 | 1 | 118 | .626 |

Table 1.2 shows the Levene's statistic to be .238 (with df 1, 118) and significance (p) value to be .626 which is greater than .05. This means Levene's F is not significant at 0.05 level of significance. Thus, the null hypothesis that 'the variances of English language competence scores of trained graduates and trained post graduate government school teachers is homogenous' is not rejected. Therefore, the assumption of homogeneity of variance is also not violated.

As the basic assumptions of parametric tests e.g., Data should be normally distributed and homogeneity of variances, are not violated, the researcher applied independent 't'- test, the result is shown in table 1.3.

**Table 1.3**

*The result of independent t-test for English language competence*

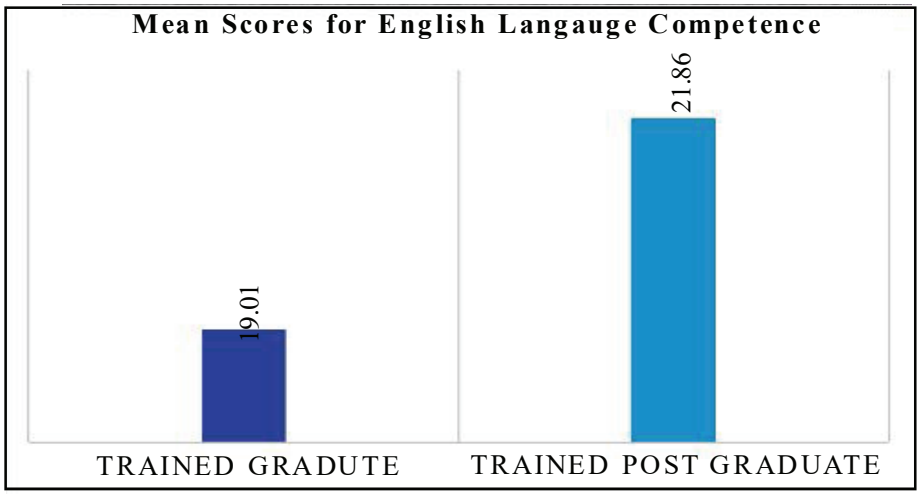
| t-test for equality of means | | |
|---|---|---|
| t | **df** | **Sig. (2-tailed)** |
| -5.081 | 118 | .000 |

As table 1.3 shows that the value of t is -5.081 with df = 118, whose two-tailed p value is .000 which is less than 0.01, therefore significant at 0.01 level of significance. Thus, the null hypothesis, 'there is no significant difference in the mean scores of English language competence of trained graduate and trained

post graduate government schoolteachers' is rejected. It means there is a significance difference in mean scores of English language competence of trained graduate and trained post graduate government schoolteachers. The mean scores of English language competence of trained graduate and trained post graduate teachers are shown in figure 1.1.

**Figure 1.1**

Mean scores for the English language competence of trained graduate and trained post graduate teachers




From figure 1.1 it is noted that the mean score of English language competence of trained post graduate government school teachers (21.86) is significantly higher than mean score of English language competence of trained graduate government school teachers (19.01). hence, trained post-graduate teachers possess significant higher English language competence. The result is in line with the study of Ibrahim (2020) and Antony et. al. (2019). These studies also agree with the view that higher education increases the language efficiency of individuals.

**Effect Size**

The researcher has calculated effect size through Cohen's 'd'. Cohen's d = $\frac{(M1-M2)}{\sigma \text{ pooled}}$, where $M_1$ is mean score of first group and $M_2$ is mean score of second group. Also, $\sigma$ pooled is equal to $\frac{\sigma 1+\sigma 2}{2}$. As per the formula, d =

0.928. As per the guidelines for interpretation of Cohen's d, it has a large effect. (Cohen, 1988). It means there is a large effect of educational qualification on English language competence of teachers.

## Discussions

The introduction of English medium in government school may be a novel phenomenon for many government schoolteachers of Punjab. Teachers can only efficiently implement it if they have required language competence. The current study aimed to examine the level of English language competence of government schoolteacher and the influence of their educational qualification on English language competence. From the above results it can be interpreted that teachers are struggling hard to implement English medium instructions in government schools. The result indicated that majority of the teachers are lacking in English language competence assessment test. Most of the teacher have low and moderate level of English language competence. Teachers' lack of basic English language competence may be due to lack of exposure to the English language in their education as well as in their early teaching carrier.

In addition to this, the result indicated that educational qualification of teachers has significant effect on the language competence of teachers. The significant higher mean scores of post graduate teachers comparatively graduate teachers show their better English language competence than the graduate teachers. A two-years master's degree or a postgraduate academic degree demonstrating mastery or a high-order overview of a specific field of study or area of professional practice, provides additional exposure to the deeper subject content as well as English language. A master's degree in a specified subjects (mathematics and Science) which is generally in English proves useful for teachers to be more familiar with the subject terminologies in English.

## Recommendations

Teaching in a language a teacher is not familiar with is not a pedagogical adaptation that a teacher can easily incorporate. Rather a teacher requires specific training and practice to mount instructional strategies and language competence for a diverse classroom. Currently, explicit attention to linguistic and cultural needs of learners is lacking in most teacher preparation programs. The theory and practices done in teacher training programs, without bilingual preparations or English as a second language courses, seems insufficient to meet the required linguistic needs of learners as well society. Therefore,

educational planners should make effective set up so that language competence can be developed at the preservice educational programs. In-service training programs should aim to promote the use of flexible approaches in teaching and learning, such as translanguaging and student-centered teaching, by offering adequate theoretical understanding and practical strategies for adapting them to varied educational settings. (Garcia & Lin, 2017; Creese & Blackledge, 2010).

Higher degree programs provide opportunities for teachers to enhance their professional knowledge and abilities, which they can employ in their teaching to enhance students' success. Various researchers have also identified that teacher qualifications as an important component leading to stronger teaching competence, and student achievement. (Antony et. al. ,2019); (Owolabi & Adedayo, 2012). Teachers frequently encounter some subject-specific terminologies in students' queries or in expository writings across science, mathematics, and social studies content areas. Many teachers, as in English language competence assessment test, fail to comprehend the meaning of subject terminologies in English. A master's degree in their specific subjects proves helpful for teachers to enhance their content knowledge as well as subject specific terminologies. Currently, the required basic qualification to be a teacher is, graduation along with a bachelor's degree in education or any equivalent degree. But as the results show, the teachers with the higher level of qualifications are more competent in English language. Therefore, teachers with higher level of educational qualifications should be appointed in schools so the English medium instruction can be implemented effectively.

Without a doubt, teachers who were not exposed to English as a teaching language throughout their early education may encounter difficulties. The passion, commitment, and hard effort they put in to stabilize and maintain their knowledge, abilities, and disposition to become good teachers, however, may help them overcome these issues. Language learning can be significantly impacted by language anxiety. (Hashemi, 2011). Therefore, a teacher must recognize it and tackle the discomfort and feeling of unease with regular language practice and self-study.

Moreover, creating a productive and nourishing environment in school premises can be very effective in language development of teachers as well as students. To considerably aid in language development, school administration must create a warm and trustworthy environment. By using language in interpersonal interactions, nonjudgmental conversations, reflections, and engagement

techniques, they must create a welcoming learning environment in the classroom where teachers feel appreciated and at ease. They should be given the chance to participate in training, seminars, and workshops by the concerned authority.

## Conclusion

To achieve meaningful headway in adopting English medium instruction in public schools, radical changes are needed in the way how teachers are trained and supported, to serve in diverse classrooms. As majority of teachers have low English language competence, educational planners should make effective set up so that language competence can be developed at the preservice educational programs. In-service training programs should aim to promote the use of flexible approaches in teaching and learning. Teachers should be encouraged so that they can improve themselves at an individual level. Educational qualification of teacher has significant effect on their English language competence. Therefore, in-service teachers should be encouraged to pursue higher degrees in their respective subjects.

## Delimitations

1. The study has been conducted on 120 government secondary school teachers, and hence the findings may lack generalizability.
2. The study has conducted in only those schools in which English is offered as optional medium of instruction.
3. The study is confined to those teachers who are teaching Mathematics, Science and Social Science.

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