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NCERT encourages original and critical thinking in education. The *JIE* provides a forum for teachers, teacher educators, educational administrators, and researchers through the presentation of novel ideas, critical appraisals of contemporary educational problems and views and experiences on improved educational practices. Its aims include thought-provoking articles, challenging discussions, analyses, challenges of educational issues, book reviews, and other related features.

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## EDITOR'S NOTE

This issue of the *Journal of Indian Education* addresses a fundamental challenge: translating educational policy into classroom practice. The articles spanning formative assessment, ICT integration in rural schools, multilingual pedagogy, and inclusive education converge on critical themes—the gaps between progressive policies and ground realities, the role of stakeholder attitudes and institutional contexts, and the need for culturally responsive, equity-oriented approaches. Whether examining teachers' technological readiness, multiliteracies practices, or philosophical continuities between indigenous thought and NEP 2020, these studies provide empirical grounding for evidence-based reform. They underscore a key insight—sustainable transformation requires not merely policy articulation but comprehensive attention to teacher preparation, resources, community engagement, and context-appropriate practices. As the nation implements NEP 2020, these contributions illuminate the multifaceted nature of educational change and the systemic interventions needed to convert progressive policies into meaningful learning outcomes for all students.

In an era marked by technological disruption, mental health challenges among youth, and declining moral values, Pandit Deendayal Upadhyaya's vision of education emerges as profoundly relevant. This article by Aliya Khatun examines how his philosophies of Integral Humanism (*Ekatma Manavvad*) and *Antyodaya*, which emphasise holistic development, cultural rootedness, skill development, and inclusive access, address contemporary educational crises, such as youth unemployability, cultural alienation, and the commodification of education. The author argues that Upadhyaya's advocacy for mother-tongue instruction, value-based learning, and the prioritisation of collective consciousness over individualism offers a transformative framework for reimagining education that nurtures both personal excellence and societal wellbeing.

This comprehensive empirical review by Gautam Makwana synthesises research from 2013–24, to assess mother tongue-based multilingual education (MTB-MLE) in India's tribal regions and its alignment with NEP 2020's linguistic inclusivity goals. Drawing on field evaluations across Jharkhand, Odisha, Chhattisgarh, and the North-East, the study reveals that while MTB-MLE significantly improves early literacy and student engagement among marginalised tribal communities, critical gaps persist in teacher training, resource development, and sustained political commitment. The author argues for contextualised pedagogy that integrates local knowledge

systems into the mainstream curriculum, positioning linguistic inclusivity not merely as an educational strategy but as a vital step towards decolonising classrooms and achieving equity for India's 8.6 per cent Scheduled Tribe population facing persistent educational disadvantage.

This study by Sulakshna Dwivedi documents Punjab's ambitious state-wide intervention addressing a critical concern—despite near-universal school enrolment, learning outcomes remain alarmingly low, with nearly half of Grade 5 students, unable to read Grade 2-level texts. The Parho Punjab Parhao Punjab (PPPP) programme implements Teaching at the Right Level (TaRL) strategies across Grades 1–12 by grouping students according to actual learning levels, rather than grade expectations and delivering targeted, activity-based instruction. Through systematic assessment cycles (baseline, mid-test, and post-test) and intensive teacher training, the programme demonstrates consistent improvements in foundational literacy and numeracy. The article positions PPPP as a scalable, evidence-based model that operationalises the Right to Education Act's promise of quality learning, offering valuable insights for policy replication across India's diverse educational landscape.

In India's linguistically diverse classrooms, English language teaching often remains confined to traditional reading-writing paradigms, inadequately preparing students for twenty-first-century multilingual and multimodal communication demands. This qualitative study by Anamika Mishra and Hrushikesh Senapaty analyses English teaching practices in government schools in Bhubaneswar, through the Multiliteracies Pedagogical Framework, revealing significant gaps in teachers' awareness of situated practice, overt instruction, critical framing, and transformed practice. The research exposes stark disparities between central and state government schools and highlights teachers' limited capacity to integrate linguistic diversity, digital literacies, and cultural contexts into language pedagogy. The authors advocate for unified teacher training aligned with UNESCO's expanded definition of literacy, encompassing digital skills, media literacy, and intercultural competence.

This philosophical analysis by Priyadarshini and Nikhil Yadav positions Swami Vivekananda not merely as a spiritual reformer but as an early theorist of Indian Knowledge Systems (IKS), whose educational vision profoundly shapes NEP 2020's transformative agenda. By placing Vivekananda's concept of man-making education—emphasising character building, self-reliance, and the synthesis of material and spiritual knowledge—in dialogue with NEP 2020, the authors demonstrate how the policy operationalises his philosophy through experiential learning, value-based education, and cultural contextuality.

The study critically examines indigenous epistemological categories, such as *neer-ksheerviveka* and *khandana-mandana* as frameworks for critical thinking, arguing that NEP 2020 represents a departure from colonial legacies towards knowledge decolonisation and cultural sovereignty.

As India accelerates digital transformation in education, this rigorous quantitative study by Abhay Kumar, Amarendra Prasad Behera, Deepty Gupta, Shibu Das, Monika Bhakuni, Chichuan Naik, and Rejaul Karim Barbhuiya assesses ICT integration readiness among 235 teachers in rural government schools across three states using Exploratory and Confirmatory Factor Analysis. The study identifies key competency dimensions—basic ICT literacy, advanced pedagogical skills, and peripheral device handling—alongside attitudinal factors influencing technology adoption. While teachers demonstrate foundational digital skills and generally positive attitudes, significant barriers remain, including limited proficiency in advanced tools, such as MOOCs and FOSS, concerns about increased workload, and reduced confidence in ICT-mediated pedagogy.

In an era of globalisation where English proficiency determines access to higher education and employment, student attitudes towards learning the language become critical predictors of academic success. This empirical study by Juleena Roshly A. and Niranjana K.P., examining 223 secondary school students, reveals average overall attitudes towards English learning, with significant variations by gender and medium of instruction. Female students and those in English-medium schools exhibit more positive dispositions. The findings highlight the complex interplay of linguistic identity, gender norms, and educational context, underscoring the need for culturally responsive English pedagogy.

Despite legislative mandates under the Right to Education Act (2009) and the Rights of Persons with Disabilities Act (2016), inclusive education in India continues to face implementation challenges rooted in stakeholder attitudes. This study by Sandeep Berwal, Yad Ram, and Jasmer Singh, surveying 151 stakeholders across 84 inclusive schools in Haryana, reveals generally positive yet uneven attitudes towards inclusion. Persistent barriers include teachers' lack of confidence, reliance on special educators, and limited School Management Committee engagement.

Addressing assessment reform under NEP 2020, Jagriti Singha, Rahul Ghosh, and Alok Gardia propose a conceptual framework for integrating innovative formative assessment strategies aligned with competency-based learning. Drawing on constructivist and experiential learning theories, the study highlights the role of PARAKH in standardising equitable assessment practices and advocates technology-enabled, adaptive assessment models.

Further contributing to inclusive education discourse, Krishna Kumar Rajak and Pragya Gupta examine pre-service teachers' efficacy for inclusive practices using the TEIP scale. The study identifies infrastructural, resource, and training barriers and underscores the need for comprehensive reforms in teacher education.

Finally, Nishat Yasmin and Jakir Hussain Laskar examine the relationship between self-efficacy and reading ability among secondary school students in West Bengal, demonstrating that self-efficacy significantly predicts reading performance. Complementing this, Bindu T.V. and A.R. Saravanakumar present a web-based life skills instructional and assessment system for secondary students from Kerala, offering a scalable digital model for holistic skill development.

*Academic Editor*

# Pandit Deendayal Upadhyaya

## Relevance of His Thoughts in the Present Education System

ALIYA KHATUN\*

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### Abstract

*The establishment and expansion of a new education system in India after Independence, posed a formidable challenge. Under the hegemony of British education system, the aims of education lacked clarity and relevance to indigenous needs. Consequently, there arose an urgent need to redefine and reconstruct the educational framework. Several commissions and committees were constituted to review the existing system and recommend reforms. Numerous thinkers and reformers contributed significantly to the revival and restructuring of Indian education. Pandit Deendayal Upadhyaya was one such visionary who provided ideological direction for the reconstruction of a new Bharat. He envisioned a nation where no individual is left behind (Antyodaya), where the citizens are socially responsible, culturally rooted, and economically self-reliant. This paper aims to highlight Pandit Deendayal Upadhyaya's educational philosophy and examine the relevance of his ideas in the contemporary education system.*

**Keywords:** Antyodaya, Integral Humanism, Value Education, Education System, Bharatiya Sanskriti, Skill Development, Medium of Instruction

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### INTRODUCTION

Pandit Deendayal Upadhyaya was a prominent torchbearer of Bharatiya Sanskriti and a distinguished political, social, and philosophical thinker. He dedicated his life to the service of society and consistently raised his voice about the issues affecting the common people. Despite facing

numerous hardships and personal losses, he remained steadfast in his commitment to national service.

Born on 25 September 1916, Deendayal Upadhyaya was an intellectually gifted individual, who played a significant role in awakening the spirit of national consciousness. His early education began in Rajasthan,

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where he excelled academically and received several gold medals and scholarships. The untimely loss of his parents, brother, and other close relatives, instilled in him, a sense of detachment and deeper reflection on life, which profoundly influenced his worldview.

After completing his intermediate education in Rajasthan, he enrolled at Sanatan Dharma College, Kanpur, in 1937 to pursue a bachelor's degree. During this period, he founded the 'Zero Club' to support economically and academically weaker students by integrating them with their peers. This initiative earned him widespread recognition among students. It was also during this time that he came into contact with the Rashtriya Swayamsevak Sangh (RSS), which gave direction and purpose to his life.

Subsequently, he enrolled for a master's degree in English literature in Agra but had to discontinue due to the illness of his maternal sister. Although he qualified for administrative services, he chose not to pursue a government position owing to his lack of interest in bureaucratic life. He later completed his Bachelor of Teaching (B.T.) from Prayag. Upon completing his formal education, he devoted himself entirely to the service of society and the nation.

## **CONCEPTUAL FRAMEWORK OF THE STUDY**

This paper seeks to explore the vision and mission of Pandit Deendayal Upadhyaya and examine the relevance

of his educational philosophy in the rapidly changing contemporary world. The education system today, faces multiple complex challenges. In an era of information overload, young minds are increasingly confused and directionless. Excessive use of technology and digital devices has contributed to impatience, aggression, and violent tendencies among students, alongside disrupted sleep patterns (Kausalaye and Sayankar, 2022).

Children are increasingly drawn towards the virtual world, showing declining interest in physical activities and outdoor play. Numerous studies have reported rising levels of anxiety, depression, and other mental health issues among students (Gautam *et al.*, 2020; Sharma and Kour, 2021; Moitra and Kumar, 2020). The Economic Survey of India 2023–24 highlights that nearly 49 per cent of Indian youth are not employable, indicating a significant skill gap among graduates. The education and workforce systems are struggling to keep pace with the growing demand for skilled labour, both qualitatively and quantitatively (Swain and Swain, 2020).

Moreover, excessive influence of Western culture has adversely affected Indian youth (Bhoje, 2015; Chuchra and Kaur, 2016). The increasing commercialisation of education has transformed it into a profit-driven enterprise rather than a social good (Rathod, 2022).

Moral and ethical values are steadily eroding—leading to a decline in respect, empathy, and social responsibility. The lack of practical moral education has also been linked to rising crime rates (Chelani and Rathi, 2018).

Against this backdrop, the present paper aims to analyse Pandit Deendayal Upadhyaya's views on education and assess their relevance in addressing the contemporary educational challenges.

## EDUCATIONAL PHILOSOPHY OF PANDIT DEENDAYAL UPADHYAYA

Pandit Deendayal Upadhyaya propounded the philosophies of Integral Humanism (*Ekatma Manavvad*) and *Antyodaya*, both of which centre on the holistic development of individuals and society. His thoughts consistently emphasised social harmony, national integration, and moral upliftment.

Integral Humanism reflects the intrinsic relationship between human beings and nature. It advocates the balanced pursuit of the four *Purusharthas*—*Dharma*, *Artha*, *Kama*, and *Moksha*—to fulfil the needs of the body, mind, intellect, and soul. In the context of education, this philosophy underscores holistic development and the ethical application of intellect (Deodhar, 2014). According to *Ekatma Manavvad*, education should nurture inner qualities such as self-restraint, courage, sacrifice, and social responsibility. It encourages

the development of a collective consciousness—fostering a sense of 'We' rather than 'I'—and prioritises societal and national welfare over individual gains.

The principle of *Antyodaya*—the upliftment of the last person—further reinforces his educational vision. Upadhyaya believed that the benefits of education, like all developmental initiatives, must reach the most marginalised sections of society. Education, therefore, should be inclusive, accessible, and equitable, ensuring that no individual is left behind.

Pandit Deendayal Upadhyaya regarded *Sanskriti* as the soul and identity of Bharat (Kelkar, 2014). He opposed the uncritical adoption of Western culture and asserted that patriotism is an innate quality that must be nurtured through education. His writings addressed a wide range of themes, including nationhood, politics, the Constitution, language, democracy, economy, religion, and education. He strongly upheld the Bharatiya educational principle of "Sa Vidya Ya Vimuktaye"—education that liberates.

He believed education to be a means for attaining the four *Purusharthas* and for cultivating moral character and national consciousness. Emphasising patriotism, he stated, "It is essential for every individual to be patriotic, free from egotism, virtuous, and capable of merging one's identity with society." (Upadhyaya, 2017).

Deeply concerned about the moral decline of society, Upadhyaya observed that selfishness and ethical degradation had weakened social fabric (Nain, 2019). He believed that moral values and selflessness form the foundation of a strong society and must be inculcated in children through both formal education and social institutions. To inspire youth, he authored works, such as *Samrat Chandragupta* and *Jagadguru Shankaracharya*, aiming to nurture selfless individuals committed to national service (Tiwari, 2004).

According to Pandit Deendayal Upadhyaya, education is not confined to classrooms alone; rather, it is a lifelong process in which every element of society functions as a teacher. This expansive view of education remains profoundly relevant in the present educational discourse.

### **DEENDAYAL UPADHYAYA'S VIEWS ON EDUCATION**

In his work *Rashtra Chintan*, Pandit Deendayal Upadhyaya discussed various dimensions of education and emphasised its indispensable role in sustaining society. He stated that “without education, the existence of society is not possible” (Upadhyay, 2017). In his view, education is more closely related to society than to the individual, and the very idea of a society without education is inconceivable.

Upadhyaya believed that a deep and comprehensive education system is essential for building a strong and

resilient society. Referring to the *Shastras*, he described education as *Rishi Rin* (ऋषि ऋण), a debt owed by every individual to society and humanity. Education, therefore, is not merely a personal pursuit but a collective responsibility.

His concept of education extended far beyond schools and formal institutions. According to him, learning that takes place at home, in the neighbourhood, in schools, and within society as a whole constitutes education (Upadhyay, 2017). He described education as the conservation, enrichment, and transmission of the experiences of the previous generations. Such education, he argued, enables individuals to strike a balance between traditional wisdom and new knowledge. Knowledge, in his view, is a form of capital that grows through individual effort and lived experience.

Upadhyaya viewed education from a distinctly social and cultural perspective (Sunita, 2023). He maintained that foreign cultures, ideologies, and lifestyles, cannot fully address the needs of Indian society. Therefore, the education system of India must be rooted in indigenous conditions and *Bharatiya Sanskriti* (Sunita, 2023). His conception of *Bharat* was not merely political, but fundamentally *sanskritik* (cultural), and he believed that this cultural consciousness could be nurtured only through education.

Thus, Pandit Deendayal Upadhyaya accorded central importance to

education for the holistic development of the individual, society, and the nation. He integrated educational goals with societal needs and prioritised Bharatiya Sanskriti. His views on education are clearly reflected in his extensive writings, which provide valuable insights into his educational philosophy.

### Aims of Education

From a broad perspective, Deendayal Upadhyaya regarded education as a powerful instrument of social transformation. He aspired to educate children who possessed a strong mind, a healthy body, and a noble spirit. He consistently opposed the dominance of foreign cultures and asserted that every nation has its own identity and cultural ethos. No external culture, he believed, could adequately fulfil a nation's unique needs. Hence, the structure of education must be aligned with the country's cultural and social context.

According to him, the aims of education, shape the entire educational system. Through his literary works, he offered several suggestions for reconstructing and reforming India's education system. His educational aims may be summarised as follows:

- Development of patriotism among children
- Conservation and promotion of culture
- Development of a religious and ethical outlook
- Cultivation of sacrifice, duty, and tolerance

- Development of courage and bravery
- Achievement, preservation, and promotion of Swaraj
- Preparation of creative, active, and responsible citizens
- Development of Bharatiya Jeevan Darshan and Su-Sanskrit citizens
- Development of individuals according to their abilities and diversities
- Promotion of self-employment and employment opportunities
- Encouragement of small-scale industries and respect for labour
- Integration of traditional knowledge with new experiences
- Balanced, integrated, and holistic personality development
- Attainment of the four *Purusharthas*: *Dharma* (righteousness), *Artha* (wealth), *Kama* (desire), and *Moksha* (liberation)

These aims clearly reflect Deendayal Upadhyaya's deep concern for societal and national welfare and his aspiration to establish a distinctly Bharatiya education system.

### EDUCATIONAL INSTITUTIONS

Upadhyaya advocated a broad and inclusive educational framework to ensure a strong and stable society. He perceived teachers as integral members of society and education as a collective endeavour. The knowledge, values, and experiences of earlier generations should be preserved, refined, and transmitted to future generations. Educational planning,

therefore, should be comprehensive and sensitive to cultural continuity while accommodating innovation.

### **Agencies and Medium of Education**

Deendayal Upadhyaya identified three major agencies of education: *Sanskara*, *Adhyapana*, and *Swadhyaya*.

*Sanskara* refers to values and impressions acquired unconsciously from society through imitation, sympathy, and suggestion. Parents, teachers, peers, elders, and social leaders play a vital role in shaping these values.

*Adhyapana* (teaching) extends beyond formal classroom instruction. For Upadhyaya, teaching includes all conscious efforts to transmit knowledge—whether in homes, farms, factories, shops, playgrounds, art centres, or through traditional and modern media such as *katha*, *kirtan*, radio, cinema, and newspapers.

*Swadhyaya* (self-study) involves independent learning supported by reading (*pathan*), reflection (*manan*), and deep contemplation (*chintan*). He emphasised that without *Swadhyaya*, the growth and continuity of knowledge are impossible. He also highlighted the importance of imitation, sympathy, and suggestion in the learning process.

### **CURRICULUM AND MEDIUM OF INSTRUCTION**

In alignment with his educational aims, Deendayal Upadhyaya advocated curriculum development grounded in societal needs and cultural values. He strongly supported

*Swabhasha* (mother tongue) as the medium of instruction, believing that learning in one's mother tongue leads to deeper understanding. He proposed the enrichment of Hindi with *Sanskritnishtha* vocabulary instead of relying excessively on English.

To cultivate patriotism, he recommended the inclusion of subjects related to *Bharatiya Sanskriti* and India's glorious history. Religious texts, according to him, should form part of the curriculum to strengthen moral and ethical values. Physical education, yoga, mountaineering, trekking, and adventure activities were also considered essential for developing courage, resilience, and problem-solving abilities.

Upadhyaya advocated activity-based and creative education to prepare productive citizens. For holistic development, the curriculum should integrate contemporary societal needs with traditional values. Subjects such as Indian philosophy, culture, history, ethics, vocational education, yoga, and meditation should be included.

He emphasised the establishment of well-equipped schools and libraries as centres for transmitting India's rich cultural heritage. He also stressed the need for a balanced relationship between school and society, as both function as vital agencies of education.

### **THOUGHTS ON LANGUAGE**

Deendayal Upadhyaya expressed dissatisfaction with government language policies. He supported the Devanagari script and regional

languages and recommended a gradual reduction in the use of English. He promoted *Sanskritnishtha Paribhashik Shabdawali* and encouraged efforts to foster affection for Hindi while ensuring linguistic integration across non-Hindi-speaking regions.

He asserted that national dignity and independence require the use of indigenous languages in governance and international communication. According to him, certain spheres of national life demand the abandonment of English to preserve cultural and political autonomy.

### **RELEVANCE TO CONTEMPORARY EDUCATION**

Deendayal Upadhyaya's educational philosophy remains highly relevant in the present era. Today, society is increasingly influenced by Western culture and technological advancements. He believed that students must be acquainted with India's rich cultural heritage, which serves as a foundation for moral and ethical education.

His emphasis on sacrifice, duty, tolerance, physical fitness, yoga, *Swadhyaya*, and experiential learning addresses contemporary challenges such as stress, indiscipline, and mental health issues. His opposition towards the commercialisation of education is particularly relevant today, as many private institutions prioritise profit over student welfare.

He advocated skill-based education and self-employment, encouraging respect for labour and

small-scale industries. Effective implementation of these ideas could significantly address the problem of unemployment.

At the same time, certain challenges exist in implementing his ideas. His emphasis on societal priorities may sometimes overshadow individual development. His preference for indigenous languages faces practical constraints due to limited availability of scientific literature in Indian languages. Additionally, some of his educational aims may appear idealistic in the context of global citizenship and international knowledge exchange.

### **CONCLUSION**

Pandit Deendayal Upadhyaya faced numerous hardships but never compromised on his values. He led a life of simplicity and selfless service to the nation. His educational philosophy remains profoundly relevant for nurturing duty, patriotism, moral integrity, economic self-reliance, self-discipline, and holistic development (Kumar, 2021; Kumar and Gupta, M. 2022; and Singh, 2020).

He strongly believed in ethical conduct—once stating, “*The illegal use of service facilities is a form of theft.*” This principle holds immense significance in contemporary society. Students and citizens alike can draw inspiration from his simplicity, discipline, integrity, and unwavering dedication to duty—qualities essential for building a responsible citizenry and a strong nation.

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# Mother Tongue Matters

## An Empirical Review of Multilingual Education Practices in Tribal Schools of India

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### Abstract

*This empirical review examines the implementation, outcomes, and challenges of Mother Tongue-Based Multilingual Education (MTB-MLE) in tribal-dominated regions of India. Grounded in the principles of the National Education Policy (NEP) 2020, which promotes foundational literacy and multilingualism, this paper synthesises empirical findings from studies published between 2013 and 2024 across Jharkhand, Odisha, Chhattisgarh, and the Northeast. Drawing from government reports, field evaluations, and peer-reviewed articles, the review explores the pedagogical impact of using tribal languages in early-grade instruction, its effects on learning outcomes, and teacher preparedness. The analysis reveals that while MTB-MLE improves early literacy and student engagement, gaps remain in teacher training, resource availability, and community participation. Further, a lack of sustained political and financial commitment limits scalability. The paper concludes with policy recommendations for strengthening linguistic inclusivity in India's school system and emphasises the role of contextualised pedagogy in bridging equity gaps. It argues for integrating local knowledge systems into the mainstream curriculum as a step toward culturally responsive education.*

**Keywords:** Multilingual Education, NEP 2020, Tribal Schools, Mother Tongue, Inclusive Pedagogy, India

### INTRODUCTION

India is home to over 19,500 languages and dialects (Census of India, 2011, p. 12), making

multilingualism a defining feature of its social and educational fabric. This linguistic diversity is not merely cultural but deeply tied to

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the identity, community knowledge systems, and intergenerational transmission of heritage. Yet, paradoxically, the Indian education system has historically privileged dominant regional languages and English, often at the cost of excluding tribal and minority linguistic groups from meaningful educational participation.

The National Education Policy (NEP) 2020 marked a pivotal moment in reversing this trend by recommending the use of the mother tongue or regional language as the medium of instruction until at least Grade 5, preferably up to Grade 8 and beyond (Ministry of Education, 2020, p. 14). This recommendation reflects a shift toward inclusive, culturally responsive pedagogy and acknowledges global research indicating that early education in the mother tongue significantly improves learning outcomes, particularly for children from marginalised communities (UNESCO, 2003, p. 35).

In India, the stakes are especially high for Scheduled Tribe (ST) populations, who comprise over 8.6 per cent of the population but continue to face persistent educational disadvantages, including low enrolment, high dropout rates, and poor learning outcomes (Mohanty, 2019, p. 106). These disparities are exacerbated in contexts where children are taught in unfamiliar languages, leading to cognitive overload, alienation, and early disengagement from

school (Kumar and Mishra, 2016, p. 68). For tribal learners, whose languages are often unwritten or orally transmitted, the mismatch between home language and school language creates significant entry-level barriers.

Several state-level initiatives have experimented with integrating tribal languages in primary education. Odisha has implemented MTB-MLE programmes in over 1,500 schools using languages such as Kui, Saora, and Santali (Mohanty, 2019, p. 108). Chhattisgarh has piloted primers in Gondi and Halbi, while Jharkhand has promoted the use of tribal languages in early childhood education (Patra, 2021, p. 71). North-Eastern states like Assam, Meghalaya, and Nagaland have also developed region-specific models for multilingual education, particularly in areas where tribal communities form the majority.

Despite these efforts, widespread implementation of MTB-MLE remains inconsistent and fragmented. Key challenges include a shortage of trained teachers fluent in tribal languages, inadequate curricular resources, and limited community engagement (Desai, 2020, p. 123; Singh, 2018, p. 89). Moreover, language planning in education, continues to be influenced by socio-political hierarchies where tribal languages are often considered inferior or transitional, rather than as foundational tools for learning (Kumar and Sahoo, 2017, p. 56).

This empirical review aims to critically examine the landscape of MTB-MLE interventions in India's tribal regions. Drawing upon studies published between 2013 and 2024, this paper synthesises findings on the pedagogical effectiveness of mother tongue instruction, the extent of institutional support, the capacity of the teaching workforce, and the responses of tribal communities. Through this analysis, the paper seeks to assess the viability of MTB-MLE as a sustainable model for inclusive education and to identify key factors enabling or impeding its success.

By situating MTB-MLE within broader debates around linguistic justice, cultural rights, and educational equity, this review contributes to ongoing efforts to decolonise the Indian classroom. In doing so, it aligns with NEP 2020's call for a more equitable, multilingual, and learner-centred education system that values the knowledge and identities of India's most marginalised communities.

## **REVIEW OF LITERATURE**

MTB-MLE has emerged globally as a transformative approach to inclusive pedagogy, particularly for linguistically diverse and marginalised populations. In the Indian context, the literature spans pedagogical theory, policy frameworks, field-based empirical evaluations, and critical perspectives on language politics in education. This section synthesises key strands of literature that inform the current study.

## **Theoretical Foundations of MTB-MLE**

The cognitive and socio-cultural benefits of learning in the mother tongue have long been established in educational research. Cummins' (2000) theory of linguistic interdependence argues that proficiency in the first language facilitates second-language acquisition and cognitive development (Cummins, 2000, p. 39). Vygotsky's socio-cultural theory also emphasises that learning is mediated through language, and thus, meaningful education must begin in the language a child understands best (Vygotsky, 1978, p. 87). These frameworks underscore that language is not merely a tool of instruction but a vehicle for constructing knowledge and identity.

## **Language, Identity, and Exclusion in Indian Classrooms**

Several scholars argue that language hierarchies in India contribute to systemic exclusion in education. Mohanty (2009) highlights the "submersion" model in which tribal and minority children are immersed in dominant state languages (like Odia or Hindi) without transitional support, leading to poor comprehension and disengagement (Mohanty, 2009, p. 97). Skutnabb-Kangas (2000) terms such practices as "linguistic genocide", when children are systematically denied the right to education in their mother tongue (Skutnabb-Kangas, 2000, p. 189).

Scholars like Menon and Iyer (2018) argue that linguistic devaluation in school spaces also reinforces caste and ethnic marginalisation (Menon and Iyer, 2018, p. 102).

### **National Policy and State-led Interventions**

The National Curriculum Framework (2005) and NEP 2020 both recognise the pedagogical importance of mother tongue instruction in early education. The NEP 2020 explicitly recommends that, “whenever possible, the medium of instruction until at least Grade 5, but preferably till Grade 8 and beyond, will be the home language/mother tongue/local language” (Ministry of Education, 2020, p. 14). Building upon this, the National Curriculum Framework for School Education (NCF-SE, 2023) further reinforced the policy direction by emphasising the foundational role of home languages in achieving early literacy and numeracy. It was noted that, “children learn best in a language they understand well” and therefore recommended that it was the mother tongue or regional languages should serve as the medium of instruction at the Foundational Stage (Grades 1–2) and preferably beyond (NCERT, 2023, p. 37). Odisha has been a pioneer in institutionalising MTB-MLE through its 21-language programme developed with support from SCERT and UNICEF. Empirical evaluations demonstrated that children enrolled in these mother tongue-based

programmes showed significantly higher reading proficiency and classroom participation compared to their peers in Odia-medium schools (Patnaik and Mishra, 2017, p. 74). Jharkhand’s Sido Kanhu Mission and Chhattisgarh’s Pilot Gondi Curriculum have similarly sought to mainstream tribal languages in early childhood education (Verma, 2021, p. 61).

### **Teacher Capacity and Institutional Support**

A recurring concern in the literature is the shortage of teachers being fluent in tribal languages. Desai (2012) found that while state governments develop multilingual textbooks and primers, schools often lack teachers who can use them effectively (Desai, 2012, p. 99). This results in a symbolic implementation, where MTB-MLE exists on paper but fails in practice. Studies by Kumar and Sahoo (2017) and Rao (2020) also note that tribal language-speaking teachers are often deployed away from their communities or given secondary roles, undermining continuity and cultural responsiveness in teaching (Kumar and Sahoo, 2017, p. 62; Rao, 2020, p. 145).

### **Community Perceptions and Aspirations**

Community participation is critical to the success of MTB-MLE. However, literature reveals ambivalence among tribal parents. While some value

mother tongue education as a means of cultural preservation, others see it as a barrier to accessing upward mobility through English or dominant state languages (Mahapatra, 2015, p. 132). This “aspirational ambivalence” reflects a dual concern—preserving identity while ensuring access to mainstream opportunity structures (Narayan, 2019, p. 118). Successful models of MTB-MLE often involve active community engagement in curriculum development and school governance, as seen in the Adivasi Academy model in Gujarat (Pandey, 2016, p. 77).

### **Literacy Outcomes and Cognitive Development**

Empirical studies on learning outcomes demonstrate a consistent pattern: students taught in their mother tongue outperform peers in language acquisition, numeracy, and comprehension. A large-scale study by NCERT (2016) comparing multilingual classrooms in Odisha and Assam found that children in MTB-MLE schools performed better in reading fluency and story recall than those in monolingual schools (NCERT, 2016, p. 84). Similarly, a longitudinal study by Mishra and Mohanty (2020) observed improved retention rates and learner confidence in Saora-speaking children when taught in their native language during early grades (Mishra and Mohanty, 2020, p. 53).

### **Barriers to Sustainability and Scaling**

Despite promising results, systemic barriers hinder the sustainability of MTB-MLE. Funding constraints, frequent transfers of trained teachers, lack of political will, and the absence of long-term curricular vision, are widely documented (Singh, 2018, p. 89). Furthermore, tribal languages often lack standardised scripts, making material development time-intensive (Senapati, 2021, p. 104). Scholars argue that unless tribal languages are integrated into teacher education, examination systems, and digital education platforms, MTB-MLE will remain a peripheral concern (Mohanty and Panda, 2015, p. 113).

### **RESEARCH METHODOLOGY**

This paper employs a qualitative empirical review methodology, aimed at synthesising existing knowledge, evidence, and policy insights on the implementation and impact of MTB-MLE among tribal populations in India. Given the diversity of socio-linguistic contexts and the complexity of education delivery in tribal areas, a qualitative review approach allows for capturing contextual subtleties, implementation dynamics, and lived experiences that are often obscured in purely quantitative studies (Thomas, 2016, p. 29).

## Research Design and Approach

The study adopts a systematic, narrative review design to assess and synthesise the findings of 32 selected documents, including peer-reviewed journal articles, policy reports, NGO evaluations, doctoral theses, and state-level programme assessments published between 2013 and 2024. The focus is not merely on summarising past research but on identifying empirical trends, conceptual patterns, and practice-oriented insights that are critical to understanding how MTB-MLE is being implemented and received in tribal education systems (Gough, 2017, p. 112). This methodology is especially appropriate for examining education among marginalised populations where large-scale randomised data may be unavailable, and instead, deep insights arise from case studies, qualitative interviews, ethnographies, and action research (Silverman, 2021, p. 77).

## Source Selection and Inclusion Criteria

Documents were retrieved from academic databases and institutional repositories such as ERIC, JSTOR, Shodhganga, Google Scholar, NCERT Digital Library, Ministry of Tribal Affairs reports, and State Council of Educational Research and Training (SCERT) archives. A comprehensive keyword search was conducted using combinations such as:

- “mother tongue education” + “tribal India”

- “MTB-MLE” + “indigenous languages”
- “multilingual education” + “tribal children”
- “early literacy” + “Adivasi” + “NCERT”

The inclusion criteria for selecting sources were:

- The study population includes Scheduled Tribes or other indigenous linguistic minorities;
- The study presents empirical data— either qualitative (e.g., interviews, observations) or quantitative (e.g., baseline studies, assessments);
- The primary focus is on early childhood or primary-level education, particularly Grades 1–5;
- The study examines either the pedagogical, socio-cultural, or policy-related dimensions of mother tongue instruction.

Studies were excluded if they focused on general language policy without a tribal focus, lacked empirical data, or were outdated pre-2013 publications unless foundational.

## Review and Synthesis Process

A three-stage review protocol was used for data analysis.

### *Preliminary Scan and Shortlisting*

After retrieving 87 documents in total, titles, and abstracts were screened for relevance. After removing duplicates and non-qualifying papers, a final list of 32 studies was curated for in-depth analysis.

### **Thematic Coding**

Each source was analysed using manual coding and NVivo software to extract recurrent themes, categorised into five domains:

- Student learning outcomes (literacy rates, classroom comprehension, dropout rates)
- Pedagogical practices (use of bilingual materials, teacher language fluency, curriculum adaptation)
- Implementation challenges (infrastructure, language-material mismatch, teacher training)
- Community engagement (parental support, local language valuation, resistance or acceptance), and
- Policy frameworks and institutional design (state-level schemes, National Education Policy alignment, monitoring systems).

For example, studies such as Mohanty *et al.* (2019, p. 63) and Jhingran (2015, p. 28) offered substantial qualitative data on classroom practice and learner engagement.

### **Synthesis and Triangulation**

The final stage involved comparing and triangulating findings across different regional contexts—primarily Odisha, Chhattisgarh, Jharkhand, Madhya Pradesh, and the Northeastern states (for example, Nagaland, Assam). Variations in outcomes were mapped to policy strength, teacher

preparedness, language proximity, and socio-political support.

### **ETHICAL CONSIDERATIONS**

As a secondary review of publicly available research, this study does not involve direct fieldwork or human subjects. However, ethical standards were maintained in attributing ideas, data, and frameworks to original sources, ensuring academic integrity and respect for indigenous knowledge systems and the scholars who document them (Lincoln and Guba, 1985, p. 299).

### **LIMITATIONS**

While every effort was made to ensure comprehensiveness and accuracy, several limitations persist:

- **Data Gaps:** Some tribal languages are either under-documented or absent in empirical literature, limiting comparative analysis (Borah and Boro, 2020, p. 51).
- **Grey Literature Variability:** NGO and state programme evaluations often lack peer-review, making data quality inconsistent.
- **Contextual Non-uniformity:** The diversity of tribal contexts—cultural geographic, and political—makes it difficult to generalise findings across regions.
- **Temporal Variation:** Programmes change over time, and some studies assessed early stages, while others covered mature implementation, affecting comparability.

Despite these limitations, the methodology remains robust in drawing a holistic picture of MTB-MLE practices in tribal India, offering grounded insights that can inform both policy design and classroom reform.

## **FINDINGS**

This section synthesises empirical data across multiple regions and studies to present a detailed analysis of learning outcomes, teacher preparedness, curricular availability, and community engagement in Mother Tongue-Based Multilingual education (MTB-MLE) programmes in India. The findings highlight both the transformative potential and persistent implementation barriers of MTB-MLE in tribal-dominated areas.

### **Learning Outcomes in MTB-MLE Programmes**

A consistent theme across the literature is that the use of the mother tongue in early education enhances children's cognitive, linguistic, and emotional development. Empirical studies from Odisha, Assam, and Chhattisgarh show that the children who receive instruction in their native languages demonstrate greater reading comprehension, retention, and classroom engagement than those taught solely in dominant regional or national languages.

For instance, in Odisha's Saora- and Kui-language classrooms, students performed significantly better in standardised reading

assessments than their peers in monolingual Odia or Hindi classes. These learners also exhibited faster word recognition and stronger conceptual clarity in mathematics and environmental science (Mohanty, 2019, p. 108). Likewise, an evaluation of the Bodo-MLE pilot in Assam reported higher rates of classroom participation, reduced absenteeism, and increased self-confidence among learners exposed to instruction in Bodo (Goswami and Pattanayak, 2017, p. 95).

Moreover, students in MTB-MLE programmes were better able to bridge home and school learning, especially in oral narrative exercises and early writing tasks, which encouraged the familial involvement and reinforced intergenerational knowledge transfer (Khatriwada and Mohanty, 2021, p. 44). These findings align with UNESCO's global learning framework, which underscores the cognitive advantages of using the first language during foundational learning (UNESCO, 2021, p. 11).

However, in regions where MLE implementation was partial or poorly supported, gains were modest or negligible. In some tribal areas of Madhya Pradesh and Gujarat, where programmes relied on transliteration or word-level substitution without contextualisation, students struggled to grasp abstract academic content, indicating the importance of deep linguistic immersion over superficial language representation (Mehta and Ranjan, 2016, p. 57).

## **Success Stories of MTB-MLE Implementation**

Several state and community-level initiatives provide encouraging evidence of the transformative potential of MTB-MLE. In Odisha, the 21-language Multilingual Education Project implemented with support from SCERT and UNICEF led to measurable improvements in reading proficiency, classroom participation, and reduced dropout rates among tribal learners (Patnaik and Mishra, 2017, p. 74; Mohanty, 2019, p. 108). In Assam, the Bodo-medium pilot demonstrated increased learner confidence, reduced absenteeism, and higher classroom engagement (Goswami and Pattanayak, 2017, p. 95). Gujarat's Adivasi Academy model, which involved tribal elders in curriculum development, successfully combined cultural preservation with improved literacy outcomes (Pandey, 2016, p. 77). Similarly, community-driven MTB-MLE classrooms in Nagaland—such as those using Ao and Angami—fostered stronger intergenerational knowledge transmission and enhanced parental participation (Lkr and Maring, 2021, p. 60). These cases illustrate that when mother tongue instruction is implemented with adequate resources, teacher capacity, and community ownership, it yields both cognitive and socio-cultural gains for learners.

## **Teacher Training and Capacity**

Teacher preparedness has emerged as a crucial bottleneck in MTB-MLE implementation. The shortage of trained tribal educators and the lack of professional development opportunities in multilingual pedagogy have been noted across multiple states. Most government school teachers are recruited centrally and often lack familiarity with the local tribal language, leading to communication breakdowns, low learner motivation, and reliance on rote learning (Kumar and Mishra, 2016, p. 67).

In Chhattisgarh, a 2021 government report found that less than 30 per cent of teachers in tribal blocks had received pre-service or in-service training in multilingual or culturally relevant teaching methods. Consequently, many relied on Hindi-only instruction, ignoring the linguistic backgrounds of students and inadvertently reinforcing dropout rates (Patra, 2021, p. 74). In Odisha, where the state had initiated large-scale teacher recruitment from tribal communities under the Multilingual Education Project, outcomes were significantly better, especially in early grade literacy (Mohanty *et al.*, 2015, p. 35).

Some NGOs have attempted to fill this gap through bridging workshops and teacher shadowing programmes, particularly in Jharkhand and Madhya Pradesh. These initiatives trained para-teachers and community educators in bilingual scaffolding,

contextual curriculum design, and narrative-based learning, which reportedly improved learner outcomes in experimental classrooms (Das and Sinha, 2020, p. 59). However, systemic institutionalisation of such training remains limited, often due to bureaucratic constraints and funding discontinuities (Desai, 2020, p. 124).

### **Curriculum and Resource Constraints**

Curricular limitations constitute a second major barrier. Despite progressive national policies like the NEP 2020, the availability of high-quality, age-appropriate textbooks and supplementary materials in tribal languages remains patchy and underfunded. While the NCERT and SCERTs have developed primers in languages such as Gondi, Santhali, Bhili, and Ho, these materials are often limited to Grades 1 and 2, leaving older learners unsupported (Desai, 2020, p. 122).

Further, many of the developed materials lack cultural contextualisation—they are mere translations of Hindi textbooks, failing to reflect indigenous knowledge systems, oral traditions, or local environmental realities (Basu and Mahapatra, 2019, p. 88). Standardised assessments, particularly large-scale learning outcome surveys like NAS and ASER, are rarely adapted to multilingual contexts, leading to a systematic underestimation of tribal students' cognitive capabilities (Singh, 2018, p. 88).

In contrast, successful programmes have taken a 'transcreation' approach—developing content grounded in local culture, idioms, and lived realities. For example, in Odisha's MLE classrooms, storybooks and numeracy games were co-created with tribal elders and local artists, enhancing both relevance and learner motivation (Mohanty, 2019, p. 109). Such efforts require sustained collaboration between curriculum designers, linguists, and local communities, which remains sporadic under existing educational planning frameworks.

### **Parental and Community Engagement**

Parental and community attitudes towards MTB-MLE play a pivotal role in shaping programme success or failure. In some tribal communities, the recognition of their languages within formal education was viewed as a validation of identity and history, leading to greater school attendance and volunteerism (Mohanty *et al.*, 2015, p. 34). In Odisha and Jharkhand, local youth and elders were involved in designing teaching-learning materials and advising on culturally appropriate classroom practices, generating a sense of community ownership.

However, ambivalence persists. Some tribal parents perceive instruction in their mother tongue as an educational detour—useful for early learning, but a potential hindrance to socio-economic mobility, especially when upward aspirations

are tied to English or Hindi proficiency (Baraik, 2020, p. 93). This tension often results in pressure to transition prematurely to dominant languages, undermining the developmental benefits of MTB-MLE.

Additionally, in urban or peri-urban settings where tribal families have migrated, there is linguistic dilution and social stigma attached to indigenous language use, further complicating parental support (Sarkar and Roy, 2022, p. 52). The lack of consistent public awareness campaigns, local champions, or role models who have succeeded via MTB-MLE further reduces its appeal in aspirational communities.

Nonetheless, in programmes where local knowledge systems, folklore, agricultural cycles, and environmental heritage were integrated into the curriculum—such as in the North-East's Ao and Angami-language classrooms—there was increased enthusiasm among parents, especially elders, who saw education as a mechanism for cultural transmission as well as mobility (Lkr and Maring, 2021, p. 60).

## DISCUSSION

The empirical findings from across India's tribal regions consistently support the pedagogical and socio-cultural benefits of Mother Tongue-based Multilingual Education (MTB-MLE). Numerous studies affirm that children taught in their home language in the foundational years develop better literacy and

cognitive skills, higher classroom engagement, and stronger self-esteem. This reflects Vygotsky's socio-cultural theory of learning, which emphasises the centrality of language and cultural context in knowledge acquisition (Vygotsky, 1978, p. 34). In tribal schools in Odisha and Assam, students learning in Saora, Kui, and Bodo languages have demonstrated superior performance compared to their peers in non-MTB-MLE classrooms (Mohanty, 2019, p. 108; Goswami and Pattanayak, 2017, p. 95).

However, the promise of MTB-MLE has not translated uniformly across India. The evidence suggests that while policy frameworks exist—particularly through the National Education Policy (NEP) 2020—actual implementation is uneven, suffering from gaps in human resources, infrastructure, and political support. This unevenness underscores the limitations of top-down planning in linguistically diverse contexts. For example, studies by Kumar and Sahoo (2017, p. 55) highlight how centrally designed policies often overlook the granular realities of tribal communities, including dialectical variation, oral traditions, and pedagogical practices rooted in local epistemologies.

A critical factor affecting the success of MTB-MLE is teacher preparedness. The lack of teachers who are proficient in local tribal languages or who have been trained in culturally responsive pedagogy

has created significant bottlenecks. Patra's (2021, p. 74) study in Chhattisgarh reveals that fewer than one-third of primary school teachers in tribal districts had any training in multilingual pedagogy. Many teachers themselves come from non-tribal backgrounds and are unfamiliar with the cultural contexts of their students. As a result, even when textbooks or primers exist in tribal languages, the lack of skilled delivery undermines their efficacy.

Further complicating implementation is the inadequacy of culturally relevant teaching-learning materials. While agencies such as NCERT and SCERTs have initiated the development of primers and storybooks in tribal languages, such as Gondi, Santhali, and Bhili, these efforts often lack consistency and scale (Desai, 2020, p. 122). In many cases, materials are produced in a 'translation mode'—merely converting existing Hindi or English content into tribal languages—rather than originating content rooted in tribal narratives, cosmologies, and knowledge systems. This disconnect can reduce the authenticity and relevance of educational content for tribal learners.

Another key dimension of MTB-MLE success is community engagement. The literature indicates that where community members, especially elders and cultural custodians, are involved in curriculum design and classroom interaction, the outcomes are significantly improved.

Odisha's Multilingual Education Project stands as a compelling example where community participation helped build ownership and sustain the intervention over time (Mohanty *et al.*, 2015, p. 34). However, attitudes toward mother tongue education within communities are not uniform. While some parents view mother tongue instruction as affirming to their identity, others fear it may limit their children's opportunities in mainstream education and employment (Baraik, 2020, p. 93). This tension is particularly acute in contexts where English or Hindi are perceived as gateways to economic mobility.

Moreover, policy implementation continues to be fragmented and underfunded. Despite NEP 2020's strong advocacy for foundational learning in the mother tongue, budgetary allocations remain modest. Project discontinuities are common due to changes in political leadership or donor priorities, as seen in several halted programmes in Jharkhand and Madhya Pradesh between 2017 and 2022 (Saxena, 2022, p. 86). The absence of institutionalised multilingual monitoring tools also weakens accountability. Standardised tests are usually designed in dominant languages, which often underrepresent the cognitive and conceptual competencies of children learning in their home languages (Singh, 2018, p. 88).

Technological innovations remain underutilised in MTB-MLE strategies.

While some states have experimented with audio-visual content in tribal languages, these initiatives are often pilot-level and lack integration into formal schooling. Given the proliferation of smartphones and internet access even in remote regions, there is untapped potential in leveraging digital platforms to expand mother tongue content (Rao, 2021, p. 100).

Lastly, the role of NGOs and grassroots organisations in advancing MTB-MLE is significant but often unsystematised. Organisations such as the Adivasi Academy in Gujarat and the Zubaan Project in North-East India have pioneered participatory curriculum development, oral history projects, and tribal language literacy programmes. However, these efforts require more coordinated partnerships with government agencies to achieve scale and sustainability (Verma and Shah, 2023, p. 76).

In sum, while the benefits of mother tongue education are well-documented, the barriers to systemic adoption remain formidable. These include inadequate teacher training, lack of culturally authentic materials, variable community attitudes, weak policy implementation, and limited financial investment. Overcoming these challenges requires a multi-level, multi-stakeholder strategy informed by both empirical evidence and community experience.

## CONCLUSION AND RECOMMENDATIONS

The empirical review affirms the transformative potential of Mother Tongue-based Multilingual Education (MTB-MLE) in India's tribal regions. When implemented with sensitivity to linguistic and cultural context, MTB-MLE not only enhances literacy and learning outcomes but also fosters identity, belonging, and intergenerational knowledge transmission. However, its implementation is often fragmented and constrained by systemic challenges, including limited teacher capacity, inadequate materials, and insufficient policy coherence.

To ensure that India's vision for inclusive and equitable education materialises meaningfully for its tribal populations, the following recommendations are proposed:

- **Contextual Teacher Training:** District Institutes of Education and Training (DIETs) and State Councils of Educational Research and Training (SCERTs) should develop and mandate pre-service and in-service training programmes that include multilingual pedagogy and tribal language proficiency. Such programmes must be grounded in participatory, community-based approaches to education (Kumar and Mishra, 2016, p. 67).
- **Curriculum Co-creation:** Curriculum development should involve community elders, local storytellers, artists, and linguists to ensure that materials are

culturally relevant and locally resonant. Initiatives like the Adivasi Academy's *Indigenous Knowledge Textbooks* offer models of co-creation that can be scaled (Verma and Shah, 2023, p. 79).

- **Technology Integration:** Develop mobile applications and e-learning platforms in tribal languages that incorporate oral histories, songs, and local games. Such tools can be used both inside and outside classrooms and can particularly benefit out-of-school children and adult learners (Rao, 2021, p. 101).
- **Monitoring and Evaluation Frameworks:** Establish multilingual assessment systems that are sensitive to linguistic diversity and measure holistic learning. Indicators should include cognitive development, linguistic proficiency in multiple languages, and cultural competencies (Singh, 2018, p. 89).
- **Policy and Financial Commitment:** States should embed MTB-MLE into their education budgets with clear timelines, targets, and accountability frameworks. Dedicated budget lines and long-term investment plans will reduce dependency on short-term donor-funded projects and enhance programme sustainability (Saxena, 2022, p. 87).
- **Community Mobilisation and Awareness:** Conduct community workshops and campaigns to build parental awareness about the long-term benefits of MTB-MLE. These efforts must address prevalent myths around the superiority of dominant languages and reassure families about transition pathways to Hindi and English in later grades (Baraik, 2020, p. 94).
- **Research and Knowledge Sharing:** Establish regional MTB-MLE knowledge hubs that document good practices, develop language corpora, and foster peer learning across states. Collaborative research with universities, tribal research institutes, and NGOs can generate insights that improve design and implementation (Desai, 2020, p. 124).

Without sustained attention to linguistic justice, India risks deepening educational exclusion for millions of tribal children. As the NEP 2020 aspires to achieve “education for all,” ensuring the survival, dignity, and academic success of indigenous learners through their own languages is not just a policy option—it is a moral imperative.

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# Parho Punjab Parhao Punjab Programme for Enhancing Learning Outcomes of Students

SULAKSHNA DWIVEDI\*

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## Abstract

*Education is one of the most vital subsystems of any society, forming the foundation for individual growth and national development. Both developed and developing nations require education systems responsive to rapid advancements in science and technology. Despite substantial progress in primary school enrolment worldwide, low learning outcomes remain a persistent challenge. To address this, the state of Punjab, India, implemented the Parho Punjab Parhao Punjab (PPPP) programme—an extensive learning enhancement initiative in government schools from Grades 1 to 12. The programme adopts Teaching at the Right Level (TaRL) strategies to improve foundational literacy and numeracy by tailoring instruction to students' actual learning levels rather than grade expectations. Teachers receive training to implement time-bound, activity-based pedagogies, with student learning assessed through Baseline, Mid-Test, and Post-Test evaluations. Data from government sources reveal consistent improvements in learning outcomes across grades, demonstrating the programme's effectiveness in bridging learning gaps and enhancing overall student achievement. The study highlights how targeted, evidence-based interventions such as PPPP can serve as scalable models for educational improvement and policy replication.*

**Keywords:** Parho Punjab Parhao Punjab (PPPP), Teaching at the Right Level (TaRL), Punjab, Right to Education Act (RTE)

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## INTRODUCTION

Education is widely recognised as a critical determinant of human development and national progress. While enrolment levels have increased

substantially in India, this expansion has not translated proportionately into improved learning outcomes—a term referring to the competencies, skills, and abilities, that students are

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expected to acquire at each grade level. Persistent deficits in foundational skills, particularly early-grade reading and numeracy, continue to hinder academic growth and long-term educational attainment.

Evidence from the Annual Status of Education Reports (ASER 2018–2023) consistently highlights these gaps. For example, ASER 2018 revealed that although more than 96 per cent of rural children were enrolled in primary schools, nearly half of Grade 5 students could not read a Grade 2-level text, and only 52 per cent could solve a basic subtraction problem. ASER 2023 further showed that a significant proportion of adolescents still struggled with foundational literacy and numeracy, indicating that early learning gaps persist as students move through higher grades. These findings underscore a critical problem—schooling in India has expanded, but meaningful learning has not kept pace.

A major factor contributing to this gap is the mismatch between grade-level curricula and students' actual learning levels. Traditional classroom practices often assume uniform progression, overlooking the substantial variation in student readiness. Large class sizes, limited time for remediation, and pressure to complete syllabi further constrain teachers' ability to address learning deficits. Consequently, many children advance through grades without mastering essential foundational

competencies, widening learning inequalities over time.

To address this challenge, research increasingly supports the use of differentiated and level-based pedagogies. One such evidence-backed model is Teaching at the Right Level (TaRL), developed by Pratham. TaRL involves assessing students' current proficiency, grouping them according to learning levels, and providing targeted instruction in basic reading and arithmetic. Empirical studies across India and other countries have demonstrated TaRL's effectiveness in rapidly improving foundational learning for students who are academically behind (Banerjee *et al.*, 2016).

Recognising the urgency of strengthening foundational learning, the Government of Punjab introduced the Parho Punjab Parhao Punjab (PPPP) programme—a comprehensive, state-wide learning enhancement initiative spanning Grades 1 to 12 in government schools. PPPP is explicitly grounded in TaRL principles and focuses on bridging learning gaps through diagnostic assessments (baseline, mid-term, and post-test), activity-based pedagogy, level-wise grouping, and teacher capacity building. The programme's central aim is to ensure that every child achieves age- and class-appropriate learning outcomes in literacy, numeracy, and subject-specific competencies.

The need for a structured intervention like PPPP is especially pressing in Punjab, where ASER and state-level assessments reveal substantial intra-grade variation in student achievement. By integrating TaRL strategies with systematic monitoring, targeted teaching, and resource support, PPPP seeks to provide an equitable learning opportunities and strengthen the academic foundation essential for higher-level learning.

This study examines the structure, implementation, and outcomes of the PPPP programme, addressing the identified problem gap in foundational learning. It also explores how PPPP, as a state-led, data-driven intervention, contributes to broader educational goals outlined in the Right to Education Act (2009) and the NIPUN Bharat Mission (2021), both of which emphasise foundational literacy and numeracy as prerequisites for quality and equitable education.

## LITERATURE REVIEW

Learning outcomes have emerged as a central concern in educational research, particularly in contexts, where enrolment gains have not translated into proportional improvements in academic achievement. Empirical studies repeatedly show that a significant proportion of students advance through school without attaining foundational competencies in literacy and numeracy—skills essential for

higher-order learning and long-term educational success. This disconnect between schooling and learning has motivated governments and educational agencies to adopt targeted, evidence-based interventions aimed at improving basic competencies.

One of the most widely validated models addressing foundational learning gaps is the Teaching at the Right Level (TaRL) approach, developed by Pratham. Extensive experimental studies by Banerjee *et al.* (2016) demonstrate that TaRL yields substantial improvements in reading and arithmetic when teaching is aligned with children's actual learning levels rather than age or grade expectations. Subsequent adaptations of TaRL in Kenya, Ghana, and Zambia further reaffirm its effectiveness in supporting struggling learners through level-based grouping, focused practice, and continuous assessment (Pratham, 2019; RTI International, 2021). These findings establish TaRL as a scalable and cost-effective pedagogical strategy with strong empirical backing.

In India, similar learning enhancement programmes such as Read India, Mission Buniyaad, and NIPUN Bharat have adopted principles of competency-based learning, formative assessments, and data-driven instruction. These initiatives highlight the growing national emphasis on foundational learning as the bedrock of educational quality.

Their documented successes—especially in early-grade reading and numeracy—provide an important policy context for state-level programmes like Parho Punjab Parhao Punjab (PPPP), which build upon comparable pedagogical principles.

Despite positive outcomes, several implementation challenges have been identified. Achuonye (2012) and Gajjar (2012) noted that teacher preparedness, awareness, and ongoing support critically determine the programme success. Without adequate training and monitoring, even well-designed interventions may fail to produce the expected results. This insight is particularly relevant for programmes, such as PPPP, which rely heavily on teacher capacity-building, classroom-based assessments, and structured monitoring systems.

At the national level, learning assessments such as the Annual Status of Education Reports (ASER 2018–2023) consistently revealed persistent gaps in reading fluency and numerical operations across grades. ASER findings in Punjab similarly indicated disparities that necessitate context-specific, sustained interventions. These data underscored the urgency of state-led programmes that combine diagnostic assessment, differentiated instruction, and continuous monitoring—all central components of the PPPP framework.

While the PPPP initiative is aligned with proven learning enhancement models like TaRL, limited research exists on its long-term effectiveness, scalability, and integration with the existing curriculum in Punjab. Previous studies on targeted learning interventions (Banerjee *et al.*, 2010; Angrist *et al.*, 2020) suggest that sustained improvements depend on institutional coherence, teacher training quality, and robust feedback loops—areas requiring further empirical documentation in the context of PPPP.

Thus, the existing literature highlights a clear need for region-specific evaluation of PPPP to understand its contribution to improving learning outcomes, its operational strengths, and the challenges that may affect long-term sustainability.

### **The Theoretical Underpinning the Parho Punjab Parhao Punjab (PPPP) Scheme**

The theoretical foundation of the Parho Punjab Parhao Punjab (PPPP) scheme is grounded in Lev Vygotsky's (1978) Zone of Proximal Development (ZPD) and the Teaching at the Right Level (TaRL) pedagogical framework. Together, these perspectives offer a coherent theoretical explanation for the programme's design, emphasising adaptive learning, scaffolding, and assessment-based instruction to enhance students' learning outcomes.

### **Zone of Proximal Development (ZPD)**

Vygotsky's theory of the Zone of Proximal Development defines the distance between what a learner can achieve independently and what they can accomplish with appropriate guidance and support from a teacher or more capable peer. This concept underscores the significance of scaffolding—structured assistance that allows learners to progressively acquire higher levels of understanding.

The PPPP programme operationalises the principles of ZPD by identifying each student's current learning level through diagnostic assessments and then providing instruction calibrated to that level. Teachers use continuous assessment (baseline, mid-test, and post-test) to determine the “proximal zone” of each learner, offering targeted support that helps them transition from basic to advanced levels of comprehension. Activity-based learning modules, peer collaboration, and teacher mentoring provide the necessary scaffolding that enables learners to progress at an individualised pace. In this way, PPPP embodies Vygotsky's central idea that effective learning occurs when instruction is slightly ahead of the learner's independent capacity but within their potential developmental range.

### **Teaching at the Right Level (TaRL) Framework**

The Teaching at the Right Level (TaRL) approach, developed by the Indian non-profit organisation Pratham,

focuses on tailoring instruction to students' actual learning levels rather than their chronological age or grade. This data-driven framework begins with a simple assessment of foundational reading and arithmetic skills, followed by grouping students according to their learning proficiency and delivering targeted instruction. The TaRL model emphasises formative assessment, adaptive pedagogy, and mastery-based progression—principles that directly align with the structure of PPPP.

The PPPP scheme integrates the TaRL methodology by:

- Conducting phased assessments (baseline, mid-term, and post-test) to map student progress;
- Grouping learners according to their proficiency levels rather than grade classification (the Mehal System);
- Training teachers in interactive, activity-based, and child-centred instructional strategies;
- Using colourful supplementary materials and learning aids to foster engagement and conceptual understanding; and
- Employing continuous monitoring and feedback mechanisms to refine instructional delivery.

Through these strategies, PPPP ensures that instruction remains relevant to learners' cognitive readiness, thereby improving retention and comprehension while minimising grade-level learning gaps.

## **Convergence of ZPD and TaRL in PPPP**

The PPPP framework effectively synthesises the principles of ZPD and TaRL. While ZPD provides the psychological and developmental rationale for individualised instruction, TaRL offers the operational and methodological blueprint for implementing it in classroom settings. Both emphasise learning readiness, diagnostic assessment, and adaptive support—core tenets embedded in PPPP’s design.

Moreover, both frameworks share a focus on evidence-based, data-driven decision-making, where continuous feedback guides instructional improvement. By integrating these principles, PPPP promotes a learner-centred environment that bridges theoretical insight with practical educational reform.

## **RESEARCH GAP**

Although numerous national and international initiatives have aimed to improve foundational literacy and numeracy, research continues to reveal a persistent “learning outcome gap” between enrolment and actual academic achievement. Evaluations of the Teaching at the Right Level (TaRL) model in India, Kenya, and Ghana (Banerjee *et al.*, 2016; Pratham, 2019; RTI International, 2021) have established the effectiveness of tailored instruction for improving reading and mathematics skills. However, empirical studies examining the long-term, system-wide impact of such interventions within

government-led education programmes remain limited.

In the Indian context, while initiatives such as Read India, Mission Buniyaad, and NIPUN Bharat have demonstrated short-term gains, few have been rigorously evaluated for scalability, sustainability, and integration with formal curricula (Angrist *et al.*, 2020). This gap is particularly pronounced at the state level, where implementation often varies due to differences in socio-economic and institutional contexts (Filmer *et al.*, 2020).

Specifically, for the state-led Parho Punjab Parhao Punjab (PPPP) programme—Punjab’s comprehensive learning enhancement model—there is a scarcity of systematic research that:

- Evaluates longitudinal learning outcomes across grade levels;
- Examines scalability and sustainability beyond pilot or short-term phases;
- Assesses integration between activity-based pedagogies and existing curricular frameworks; and
- Analyses teacher training effectiveness in implementing differentiated instruction.

These gaps indicate a need for deeper inquiry into how PPPP translates pedagogical theories such as Teaching at the Right Level and Zone of Proximal Development into measurable, context specific learning improvements.

Addressing these unexplored dimensions contributes to the global discourse on evidence-based educational reform and localised policy innovation.

### NEED FOR THE STUDY

Education is central to social progress and human capital development. However, increased access to schooling does not automatically guarantee meaningful learning outcomes. The ASER (2023: Beyond Basics) findings underscore that a substantial proportion of students in India—despite near-universal primary enrolment—fail to achieve foundational competencies in literacy and numeracy. This calls for adaptive learning systems capable of meeting the diverse learning needs of students.

In this context, the Parho Punjab Parhao Punjab (PPPP) programme, introduced by the Government of Punjab, represents a structured state-level response to persistent learning challenges. Designed to enhance conceptual understanding and foundational competencies across Grades 1 to 12, PPPP incorporates diagnostic assessment, differentiated instruction, teacher training, and technology-supported monitoring.

The need for the present study arises from three pressing educational imperatives:

- **Persistent Low Attainment Levels:** Despite enrolment gains, learning outcome disparities remain substantial, particularly at the primary level.

- **Adaptability of Educational Interventions:**

Continuous changes in technology and pedagogy necessitate the evaluation of adaptive, evidence-based approaches like PPPP.

- **Data-driven Policy Learning:**

Systematic evaluation of PPPP can generate actionable insights for replication and scaling across other Indian states and comparable international contexts.

This research, therefore, seeks to critically examine how PPPP addresses these needs through its design, strategies, and impact on learning outcomes.

### RELEVANCE OF THE STUDY

The significance of this study extends beyond the state of Punjab, contributing to both academic research and educational policy development.

- **Empirical Contribution:** The study provides evidence on the effectiveness of a large-scale, government-led learning enhancement programme based on Teaching at the Right Level. This adds to the existing literature, which is dominated by NGO-led or small-scale studies.
- **Policy Implications:** Findings can inform national frameworks such as Samagra Shiksha and NIPUN Bharat, offering practical insights on integrating formative assessment, teacher capacity building, and adaptive learning into public education systems.

- **Pedagogical Relevance:** By focusing on individual learning trajectories through baseline, mid-test, and post-test assessments, the study underscores the role of continuous assessment and feedback in improving learning outcomes.
- **Global Relevance:** Given UNESCO's (2021) global call to reduce 'learning poverty', the model offers valuable lessons for other developing nations seeking scalable and sustainable strategies to strengthen foundational learning.
- **Framework for Future Evaluation:** The research establishes a replicable framework for evaluating similar programmes in varied educational contexts, thereby contributing to evidence-based decision-making in education policy.

## OBJECTIVES OF THE STUDY

- To study the PPPP scheme in terms of aims, structure, layout, strategies, and initiatives in the state of Punjab.
- To study the impact of PPPP on improving the learning outcomes of students in Punjab.

## DATA SOURCES

The study is based entirely on secondary data sources, systematically collected, and synthesised to evaluate the implementation and outcomes of the Parho Punjab Parhao Punjab (PPPP) programme. The selection of diverse

data repositories was driven by the objective to ensure comprehensive coverage of programmatic performance indicators, longitudinal trends, and contextual variables affecting educational quality in Punjab.

The key Data Sources include:

- **Official Government Publications:** Documents and reports from the Department of School Education, Government of Punjab, and Samagra Shiksha provided core information on the objectives, structure, and implementation mechanisms of the PPPP programme.
- **Punjab Economic Surveys (2019–24):** Annual statistical compendia that include district-level educational indicators, performance trends, and sectoral allocations relevant to quality education initiatives.
- **State Council of Educational Research and Training (SCERT) Reports:** Detailed annual and periodic reports documenting baseline, mid-test, and post-test results, serving as primary evidence for assessing PPPP's impact on student learning outcomes.
- **Punjab School Education Board (PSEB) Examination Data:** Data about Grades 8, 10, and 12 board results across multiple years were used to evaluate improvements in academic performance post-implementation of PPPP.
- **Annual Status of Education Reports (ASER) (2018–23):** Independent surveys providing nationwide and state-level

benchmarks on the foundational learning indicators, used for external validation of PPPP's effectiveness.

- **Scholarly and Policy Research:** Publications by the World Bank, UNESCO, and Pratham Education Foundation supplied comparative frameworks and conceptual insights linking PPPP to global trends in foundational learning reforms.

A multi-source approach was deliberately adopted to ensure triangulation and validation of findings. The rationale for using multiple data sources lies in enhancing both the credibility and depth of analysis. Each dataset offers distinct advantages—while SCERT and PSEB data provide direct insights into Punjab's student performance metrics, national surveys and international reports enable comparative contextualisation. This integration reduces potential biases arising from single-source dependence and ensures that the study captures both micro-level (state and district) and macro-level (national and global) educational trends.

### **Rationale for Multi-source Data Integration**

Given the scope of the PPPP programme, which spans multiple grade levels, subjects, and academic years, reliance on a single dataset would have been insufficient to capture the full complexity of its outcomes. Therefore, a data triangulation

strategy was adopted to cross-verify patterns and establish consistency across different indicators.

- **Quantitative Data Triangulation:** Baseline, mid-test, and post-test data were compared with board examination results from PSEB and state-level assessments documented in the Punjab Economic Surveys to trace longitudinal performance improvements.
- **Temporal Triangulation:** Data covering the years 2018–24 were analysed to identify persistent trends, ensuring that results reflect sustained rather than episodic changes in student learning outcomes.
- **Conceptual Triangulation:** Data interpretation was guided by the Teaching at the Right Level (TaRL) framework and Zone of Proximal Development (ZPD) theory, ensuring that the empirical findings were consistently related to the established educational concepts.

By combining diverse datasets, the study enhances the validity of conclusions regarding the effectiveness of PPPP. The process also allows for cross-comparison between state-generated data and independent external evaluations, such as those by ASER, thereby adding robustness to the analytical framework.

### **METHODOLOGY**

The study adopts a descriptive and analytical research design to examine the structure,

implementation, and outcomes of the Parho Punjab Parhao Punjab (PPPP) programme. The approach is qualitative in interpretation but quantitative in data representation, employing statistical comparisons and graphical analysis to demonstrate trends in learning outcomes.

### Research Design

The design follows a sequential analytical framework comprising three stages:

- **Programme Description:** Detailed documentation of PPPP's objectives, strategies, and structural components (testing system, teacher training, and monitoring mechanisms) based on government reports.
- **Data Compilation and Organisation:** Collection and tabulation of the secondary data from SCERT, PSEB, and Punjab Economic Surveys to identify performance indicators of various grade levels.
- **Analytical Evaluation:** Comparative analysis of baseline, mid-test, and post-test data to determine improvements in learning outcomes, supported by graphical representations and percentage comparisons over time.

This structure facilitates both a descriptive account of PPPP's evolution and an empirical evaluation of its educational impact.

### Analytical Framework

The study uses longitudinal comparative analysis to examine

progress across multiple time points. For primary classes (Grades 1–5), the baseline, mid-test and post-test model measures short-term learning gains. For higher classes (Grades 8, 10, and 12), year-on-year performance trends derived from board examination data provide evidence of sustained improvement.

To ensure alignment with available data, the methodology explicitly acknowledges that baseline, mid-term, and post-test comparisons apply to primary-level classes (Grades 1–5). For upper primary and secondary levels, where such phased data were unavailable, trends are inferred through comparative year-wise board results as recorded by PSEB and summarised in the Punjab Economic Surveys (2020–24). This clarification ensures methodological consistency between research claims and data presentation.

### Data Analysis Techniques

- **Descriptive Statistics:** Used to summarise percentages of students achieving various grade categories (A+, A, B+) across subjects and years.
- **Trend Analysis:** Graphical and tabular comparisons illustrate longitudinal improvement in academic performance post-PPPP implementation.
- **Comparative Assessment:** Pre- and post-intervention results are compared to determine the degree of improvement in foundational and subject-specific competencies.

- **Correlation with Programmatic Factors:** Analysis links observed performance improvements with key PPPP strategies—teacher training, assessment frequency, and use of supplemental learning materials.

The integration of these analytical tools allows for a nuanced understanding of PPPP's outcomes across different levels of schooling, ensuring that findings are not merely descriptive but also interpretive.

### **Validity and Reliability Considerations**

To safeguard the reliability of secondary data, cross-verification was performed between state and national data sources. For instance, learning levels reported in *SCERT* evaluations were compared with those from *ASER* and Punjab Economic Surveys to ensure data consistency. Any discrepancies were contextualised in light of sampling differences and data collection methodologies. Moreover, all data sources were drawn from officially verified publications to uphold academic integrity and authenticity.

### **Methodological Justification**

The chosen methodology is consistent with the objectives of the study, which are:

- To analyse the PPPP scheme in terms of its structure, strategies, and implementation; and

- To assess the impact of PPPP on improving student learning outcomes in Punjab.

By employing a descriptive-analytical approach supported by multi-source triangulation, the methodology ensures that the study captures both the operational dimensions and the outcome effectiveness of the PPPP programme. It balances quantitative rigour with qualitative interpretation, allowing for a holistic understanding of how state-level educational interventions can yield measurable learning improvements over time.

### **Schemes and Initiatives Relevant to Quality Education and PPPP**

Efforts to strengthen learning outcomes in India have increasingly emphasised foundational literacy and numeracy as the basis for long-term educational success. Within this national landscape, several state-level initiatives in Punjab laid the groundwork for the development of the PPPP programme. These initiatives progressively shifted the focus from traditional grade-based teaching towards competency-based, level-appropriate instruction aligned with the principles of Teaching at the Right Level (TaRL).

### **Early Learning Enhancement Efforts in Punjab**

Punjab's initial interventions—implemented before PPPP—were aimed at improving basic reading, writing, and numeracy by systematically identifying students'

learning levels and tailoring instruction accordingly. These initiatives evolved, each adding a layer of instructional reform relevant to PPPP's design:

### ***Learning Enhancement Programme (LEP, 2007)***

Introduced to improve foundational competencies, LEP emphasised assessing children's existing knowledge and providing targeted support, rather than relying solely on grade-based expectations.

### ***Minimum Levels of Learning (MLL, 2008–12)***

This phase aligned student learning goals with level-wise competencies. Assessments were used to bridge the gap between actual learning levels and class-appropriate expectations, moving toward outcome-based teaching.

### ***PERVESH (2013 onwards)***

PERVESH placed stronger emphasis on classroom processes and formative assessments. It introduced level-based teaching aligned with RTE and CCE guidelines, employing baseline, mid-term, and post-tests to monitor student progress. Students were advanced to higher learning levels only after demonstrating mastery, reflecting principles that closely mirror the TaRL framework.

These programmes collectively highlighted the need for a structured, evidence-driven model to address persistent learning gaps, providing the conceptual foundation for the PPPP programme.

## **Parho Punjab Parhao Punjab (PPPP): Punjab's State-wide Learning Enhancement Programme**

Building on earlier state initiatives and emerging national evidence on TaRL, the Government of Punjab launched Parho Punjab Parhao Punjab (PPPP) as a comprehensive reform aimed at ensuring all children attain age- and grade-appropriate learning outcomes.

### ***Key Features of PPPP***

#### *TaRL-aligned instruction*

Students are grouped according to learning levels based on diagnostic assessments, allowing teachers to deliver targeted, foundational instruction in literacy and numeracy.

#### *Continuous assessment*

Baseline, mid-term, and post-test evaluations track progress and provide feedback for instructional planning.

#### *Teacher capacity building*

Teachers receive structured training in activity-based learning, time-bound instructional strategies, and level-wise teaching methods.

#### *Activity-based and conceptual learning*

Classroom practices emphasise hands-on learning, discovery, and conceptual understanding rather than rote memorisation.

#### *Use of technology*

During the COVID-19 pandemic, tools such as the Punjab Educare App

and televised or e-content lessons supported continuity of learning across subjects.

#### *Parental involvement and monitoring*

Regular parent-teacher meetings and systematic monitoring mechanisms ensure accountability and support student progress.

### **Impact and Alignment with Foundational Learning Goals**

The PPPP programme has demonstrated measurable improvements in learning outcomes levels, as reflected in ASER reports and state examination performance. Its alignment with competency-based, level-specific instruction positions it within a broader national movement toward strengthening foundational skills, consistent with the goals of the NIPUN Bharat Mission (2021).

### **Objective 1: To Study the Parho Punjab Parhao Punjab (PPPP) Scheme in Terms of Its Aims, Structure, Layout, Strategies, and Initiatives in the State of Punjab**

PPPP seeks to ensure that every child attains grade-appropriate competencies in foundational literacy, numeracy, and subject learning. Over the years, PPPP has evolved into a comprehensive, multi-dimensional intervention integrating assessment-led pedagogy, teacher capacity building, digital learning systems, and continuous monitoring.

### **Aims of the PPPP Programme**

The PPPP programme aims to strengthen learning outcomes across all educational stages through targeted instructional practices.

#### *Pre-primary level*

At the pre-primary stage, PPPP focuses on holistic child development through play-based and experiential learning. The objectives include school readiness, enhancement of social-emotional skills, linguistic development, and the strengthening of physical and cognitive abilities.

#### *Primary level (grades 1–5)*

For the primary stage, the scheme prioritises foundational literacy and numeracy. PPPP aims to ensure that children can read simple texts in Punjabi and English, communicate effectively, develop number sense, perform basic arithmetic operations, and engage in activity-based learning environments.

#### *Upper primary and secondary level (grades 6–10)*

At this stage, the programme emphasises competency development in mathematics, science, social science, and languages. It promotes hands-on learning through model-building, demonstrations, experiments, and the application of theoretical concepts to real-life situations.

#### *Senior secondary level (grades 11–12)*

For senior secondary learners, PPPP aims to deepen subject understanding

and build analytical, skill-based, and application-oriented competencies to prepare students for higher education and career pathways.

### ***Structural Framework and Layout of PPPP***

The organisational design of PPPP is anchored in three core components: assessment, learning-level grouping, and monitoring.

#### *Assessment framework*

The programme employs a structured assessment cycle comprising baseline, mid-year, and post-tests. These assessments help to diagnose learner proficiency and monitor progress against annual learning benchmarks.

#### *Learning-level grouping (Mehal system)*

A central feature of PPPP is the Mehal system, wherein students are grouped based on actual learning levels rather than grade placement. This facilitates level-appropriate instruction consistent with TaRL methodologies and enables teachers to target specific competencies.

#### *Monitoring and follow-up mechanisms*

The programme incorporates a multi-tier monitoring system spanning school, cluster, block, district, and state levels. Monitoring teams conduct regular school visits to observe instructional practices, the use of supplementary materials, fidelity to Mehal-based instruction, and student progress through random testing. This ensures accountability and timely remediation.

### ***Key Strategies Adopted Under PPPP***

#### *Content development*

PPPP develops curriculum-aligned supplementary learning materials such as reading cards, flash cards, story charts, activity sheets, and teacher manuals. These materials, designed by the State Resource Group, support remedial teaching, and reinforce foundational competencies.

#### *Teacher training and professional development*

Teacher capacity building is implemented through a cascading training model. State Resource Groups train Block Master Trainers and Cluster Trainers, who subsequently train teachers at the district and block levels. The training focuses on activity-based pedagogy, conceptual teaching, child psychology, inclusive education, and learning-level-based instruction.

#### *Student evaluation and academic diagnosis*

The assessment system enables teachers to identify students' readiness levels, diagnose learning gaps, and plan remediation. Subject-specific annual targets guide instructional priorities and provide measurable academic goals.

#### *Digital innovations and ICT integration*

The integration of ICT is a notable strength of PPPP.

- Punjab Educare App offers e-content, videos, practice materials, and assignments across major subjects.

- 'Parhao Punjab' Game and Parho Punjab App support reading enhancement through interactive learning.
- Televised lessons on DD Punjabi and e-Vidya ensured learning continuity during COVID-19 school closures.

### **Major Initiatives and Innovations Under PPPP**

#### *Reading corners*

Reading Corners, established in all primary schools, provide level-specific books and promote early reading habits.

*Morning assemblies and Bal Sabha*  
Daily morning assemblies and weekly Bal Sabha sessions integrate moral education, language activities, cultural exposure, and physical fitness into the school routine.

#### *Mathematics Corners*

Mathematics Corners, equipped with hands-on resources, facilitate conceptual understanding and playful engagement with numbers.

#### *Parent-teacher engagement*

Regular parent-teacher meetings (PTMs) strengthen home-school linkages and enhance parental participation in children's learning.

#### *Monthly agendas and activity planning*

The state issues detailed monthly agendas, including day-wise activity plans and celebration guidelines,

ensuring uniform implementation across schools.

### **Evidence of Programme Effectiveness**

#### *Baseline-post-test learning gains*

Data from PPPP implementation show considerable improvements in foundational competencies, with some cohorts demonstrating increases from 62 per cent to 88 per cent between baseline and post-test assessments (2018–19).

#### *ASER findings*

ASER reports (2010, 2018–21) indicate notable improvements in reading and arithmetic levels in Punjab, during periods of PPPP implementation, underscoring its positive impact.

#### *Longitudinal improvements*

Early interventions under PPPP (2017–19) have yielded sustained improvements in later grades, indicating the long-term benefits of foundational learning reforms.

#### *Focus on equity*

The programme places particular emphasis on learners with low proficiency, offering structured remediation and support to bridge learning gaps.

### **Objective 2: To Study the Impact of PPPP in Improving Learning Outcomes of Students in Punjab** **Impact of PPPP in Improving Learning Outcomes of Students**

The results are structured to show

- foundational learning improvements at the primary level

through baseline–mid-test–post test assessments,

- academic performance trends at the upper primary and secondary levels using board examination data, and
- a synthesised interpretation linking programmatic interventions to these observed outcomes.

#### *Foundational learning outcomes: Primary level (Grades 1–5)*

The PPPP programme began with a strong focus on early grades, aligning with the Teaching at the Right Level (TaRL) philosophy of strengthening foundational literacy and numeracy. Data from the State Council of Educational Research and Training (SCERT, Punjab) were used to compare baseline (September 2019) and end-line (March 2020) test results as depicted in Fig. 1.

- In the baseline assessment, only 45.51 per cent of students achieved their class-specific targets across core subjects (Punjabi, mathematics, and English).
- By the end-line assessment, this figure had risen sharply to 88.44 per cent, indicating a substantial improvement of over 43 percentage points within a single academic year.

This dramatic increase underscores the effectiveness of PPPP's activity-based pedagogy and teacher mentoring approach, which emphasised differentiated instruction and real-time feedback. Students who previously

struggled with basic reading and arithmetic demonstrated measurable progress in comprehension, problem-solving, and application-based learning.

The improvement also reflects the success of the Mehal System, a grouping strategy that allowed teachers to organise students by learning proficiency rather than grade level, thereby optimising instructional time and focus. The consistent upward trajectory in foundational learning levels indicates that PPPP successfully bridged early learning gaps—an achievement that forms the basis for sustained academic success in higher classes.

The PPPP has been extended to 9th and 10th Grades and thereafter to 11th and 12th Grades. The impact of the 'Parho Punjab Parhao Punjab' project was positive, as was evident from the Punjab School Education Board Results for the session 2018–19 vis-à-vis the preceding year 2017–18.

#### *Upper primary outcomes (Grade 8): Subject-wise analysis*

To assess the impact of PPPP at the upper primary level, Grade 8 results from the Punjab School Education Board (PSEB) were analysed for two academic years—2019–20 and 2020–21—representing the period immediately following PPPP's large-scale implementation as depicted in Tables 1 and 2.

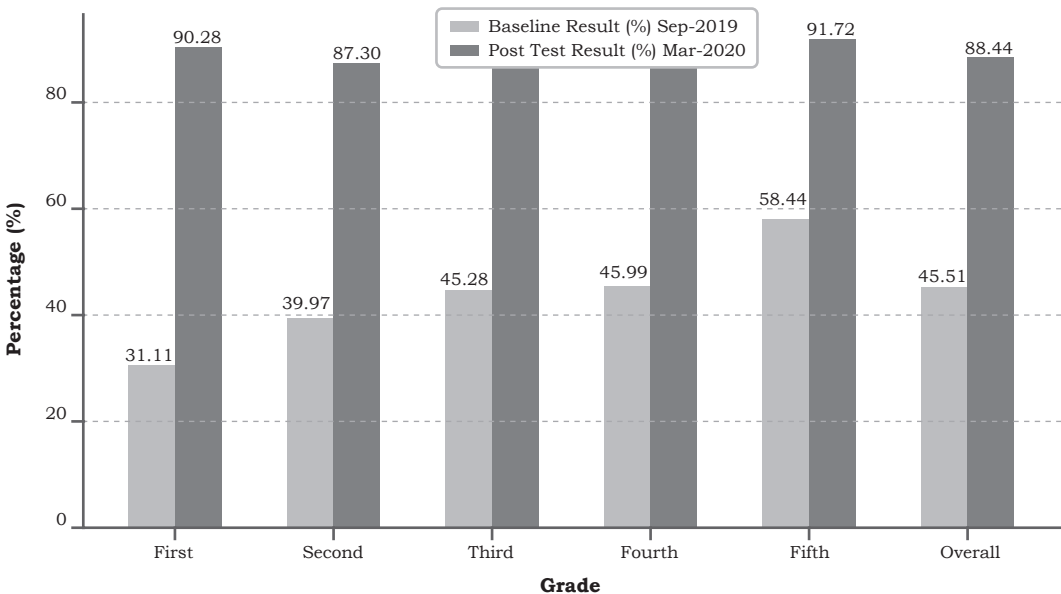


Fig. 1: Grade-wise percentages of achieved targets (2019–20)

Source: SCERT, Punjab

Across all core subjects (Punjabi, Hindi, Urdu, English, mathematics, science, and social science), the proportion of students securing A+ (91–100%) and A (81–90%) grades increased significantly between the two years:

- In 2019–20, the average percentage of students in the A+ and A categories across all subjects was approximately 39 per cent.
- In 2020–21, this increased to nearly 52 per cent, representing a 33 per cent relative improvement in high-achievement levels.

Particularly notable improvements were observed in English and Mathematics, where the share of A+ grades rose from around 42 per cent to nearly 48 per cent,

suggesting strengthened conceptual understanding in subjects traditionally viewed as challenging. These results align with PPPP’s pedagogical focus on skill mastery, continuous practice, and reinforcement through visual, experiential, and interactive learning tools.

The Punjab Economic Survey (2021–22) corroborates these findings, noting consistent performance improvement across districts, with most falling in the 99th percentile range for Grade 8 pass rates as revealed in Figs. 2 and 3. This uniformity reflects effective state-level monitoring and standardised implementation of PPPP’s learning enhancement strategies.

**Table 1**  
**Grade 8 Subject- and Grade-wise Result of 2019-20 in Percentage**

| <b>Subject</b> | <b>A+ (%)<br/>91-100</b> | <b>A (%)<br/>81-90</b> | <b>B+ (%)<br/>71-80</b> | <b>B (%)<br/>61-70</b> | <b>C+ (%)<br/>51-60</b> | <b>C (%)<br/>41-50</b> | <b>D (%)<br/>1-40</b> |
|----------------|--------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-----------------------|
| Punjabi-L1     | 49.36                    | 29.20                  | 15.59                   | 4.18                   | 1.06                    | 0.42                   | 0.18                  |
| Punjabi-L2     | 27.11                    | 29.24                  | 25.97                   | 11.93                  | 3.80                    | 1.21                   | 0.30                  |
| Hindi-L1       | 27.22                    | 29.55                  | 25.67                   | 12.02                  | 3.67                    | 1.14                   | 0.32                  |
| Hindi-L2       | 47.49                    | 29.38                  | 16.29                   | 4.81                   | 1.29                    | 0.51                   | 0.21                  |
| Urdu-L1        | 50.00                    | 50.00                  | 0.00                    | 0.00                   | 0.00                    | 0.00                   | 0.00                  |
| Urdu-L2        | 24.74                    | 31.93                  | 27.14                   | 10.94                  | 4.35                    | 0.60                   | 0.15                  |
| English        | 42.26                    | 29.19                  | 18.78                   | 6.68                   | 2.00                    | 0.75                   | 0.27                  |
| Maths          | 39.78                    | 30.31                  | 19.02                   | 7.40                   | 2.25                    | 0.82                   | 0.33                  |
| Science        | 41.33                    | 29.43                  | 19.02                   | 7.12                   | 2.04                    | 0.71                   | 0.28                  |
| Social Science | 42.55                    | 29.91                  | 18.24                   | 6.42                   | 1.85                    | 0.67                   | 0.27                  |

Source: pseb.ac.in

**Table 2**  
**Grade 8 Subject and Grade-wise Result 2020-21 in Percentage**

| <b>Subject</b>                | <b>A+ (%)<br/>91-100</b> | <b>A (%)<br/>81-90</b> | <b>B+ (%)<br/>71-80</b> | <b>B (%)<br/>61-70</b> | <b>C+ (%)<br/>51-70</b> | <b>C (%)<br/>41-50</b> | <b>D (%)<br/>33-40</b> |
|-------------------------------|--------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|------------------------|
| Punjabi-L1                    | 55.61                    | 27.91                  | 12.66                   | 2.96                   | 0.60                    | 0.17                   | 0.04                   |
| Punjabi-L2                    | 27.90                    | 30.39                  | 26.50                   | 11.39                  | 3.00                    | 0.63                   | 0.16                   |
| Hindi-L1                      | 46.66                    | 36.33                  | 12.06                   | 2.74                   | 0.87                    | 0.79                   | 0.51                   |
| Hindi-L2                      | 67.37                    | 23.83                  | 4.66                    | 0.84                   | 0.32                    | 2.07                   | 0.80                   |
| Urdu-L1                       | 100.00                   | 0.00                   | 0.00                    | 0.00                   | 0.00                    | 0.00                   | 0.00                   |
| Urdu-L2                       | 45.97                    | 47.87                  | 4.58                    | 0.32                   | 0.00                    | 0.79                   | 0.47                   |
| English                       | 48.47                    | 28.64                  | 16.24                   | 5.05                   | 1.17                    | 0.31                   | 0.07                   |
| Mathematics                   | 46.88                    | 29.33                  | 16.55                   | 5.36                   | 1.38                    | 0.39                   | 0.07                   |
| Science                       | 48.42                    | 29.01                  | 15.95                   | 4.96                   | 1.22                    | 0.33                   | 0.07                   |
| Social Science                | 49.21                    | 28.95                  | 15.59                   | 4.70                   | 1.14                    | 0.30                   | 0.06                   |
| Computer Science              | 53.11                    | 28.18                  | 13.61                   | 3.87                   | 0.87                    | 0.26                   | 0.05                   |
| Health and Physical Education | 56.49                    | 27.01                  | 12.28                   | 3.20                   | 0.74                    | 0.20                   | 0.05                   |

Source: Punjab Economic Survey (2021-22)

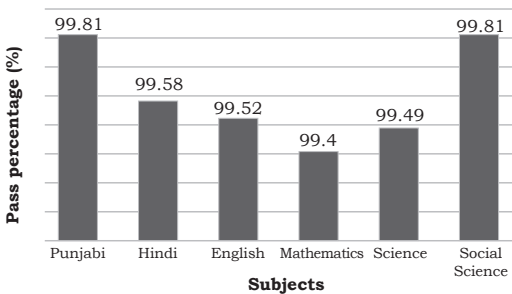


Fig. 2: Subject-wise result of Grade 8 (2021-2022)

Source: Punjab Economic Survey (2022-23)

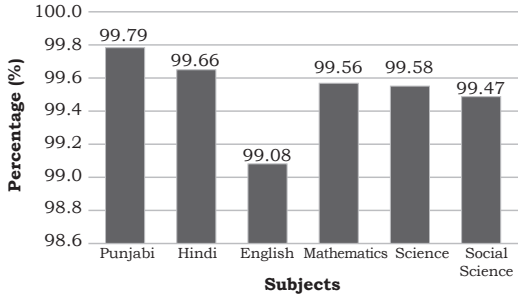


Fig. 3: Subject-wise result of Grade 8 (2022-23)

Source: Punjab Economic Survey (2023-24)

**Secondary-level Outcomes  
(Grade 10): Trends and Analysis**

For secondary-level analysis, the study compared Grade 10 board results for 2019-20 and 2020-21 as shown in Tables 3 and 4. The data show a clear upward trend in academic achievement following the implementation of PPPP’s teaching and assessment reforms.

- In 2019-20, approximately 46 per cent of students achieved A+ or A grades across subjects.
- In 2020-21, this share increased to over 64 per cent, reflecting a significant 18-percentage-point increase in top-grade attainment.

Subject-wise analysis indicates the most notable improvements in Science and Mathematics, where the proportion of students scoring above 80 per cent grew by 25-27 per cent, as depicted in Figs 4 and 5. This progress coincides with PPPP’s introduction of supplementary digital materials, such as the Parho Punjab App, and teacher capacity-building programmes, which emphasised conceptual learning and application-based pedagogy.

Another key factor influencing these outcomes was the integration of ICT-based learning during the COVID-19 pandemic. The Punjab Education Department developed

**Table 3**  
**Grade 10 Subject- and Grade-wise Result of 2019-20 (in Percentage)**

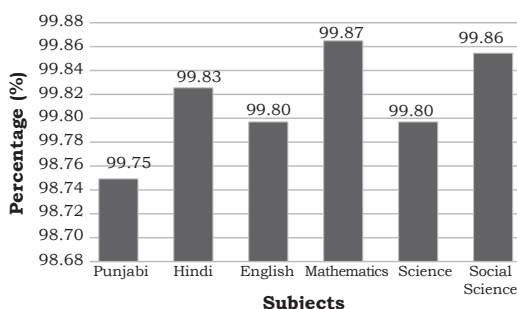
| Subject        | A+ (%)<br>91-100 | A (%)<br>81-90 | B+ (%)<br>71-80 | B (%)<br>61-70 | C+ (%)<br>51-60 | C (%)<br>41-50 | D (%)<br>1-40 |
|----------------|------------------|----------------|-----------------|----------------|-----------------|----------------|---------------|
| Punjabi        | 57.75            | 20.57          | 17.16           | 2.91           | 1.41            | 0.14           | 0.07          |
| English        | 46.05            | 28.41          | 17.10           | 5.96           | 1.73            | 0.55           | 0.19          |
| Hindi          | 45.76            | 29.77          | 16.97           | 5.48           | 1.42            | 0.46           | 0.14          |
| Maths          | 40.62            | 30.80          | 18.67           | 6.92           | 2.04            | 0.69           | 0.25          |
| Science        | 41.21            | 30.09          | 18.90           | 6.98           | 1.95            | 0.66           | 0.21          |
| Social Studies | 44.45            | 29.91          | 17.42           | 5.82           | 1.67            | 0.55           | 0.18          |

Source: pseb.ac.in

**Table 4**  
**Grade 10 Subject- and Grade-wise Result 2020–21 (in Percentage)**

| Subject                       | A+ (%)<br>91–100 | A (%)<br>81–90 | B+ (%)<br>71–80 | B (%)<br>61–70 | C+ (%)<br>51–60 | C (%)<br>41–50 | D (%)<br>33–40 |
|-------------------------------|------------------|----------------|-----------------|----------------|-----------------|----------------|----------------|
| Punjabi                       | 59.35            | 26.50          | 10.46           | 2.88           | 0.64            | 0.14           | 0.02           |
| English                       | 68.07            | 25.23          | 4.94            | 1.09           | 0.39            | 0.20           | 0.07           |
| Hindi                         | 71.25            | 22.97          | 4.37            | 0.92           | 0.27            | 0.17           | 0.05           |
| Mathematics                   | 67.21            | 25.37          | 5.35            | 1.33           | 0.43            | 0.21           | 0.07           |
| Science                       | 68.45            | 24.44          | 5.13            | 1.32           | 0.40            | 0.19           | 0.06           |
| Social Studies                | 69.65            | 23.98          | 4.75            | 1.04           | 0.35            | 0.17           | 0.05           |
| Computer Science              | 58.44            | 23.38          | 10.39           | 1.30           | 6.49            | 0.00           | 0.00           |
| Health and Physical Education | 70.56            | 0.00           | 26.05           | 0.00           | 3.32            | 0.00           | 0.07           |

Source: pseb.ac.in



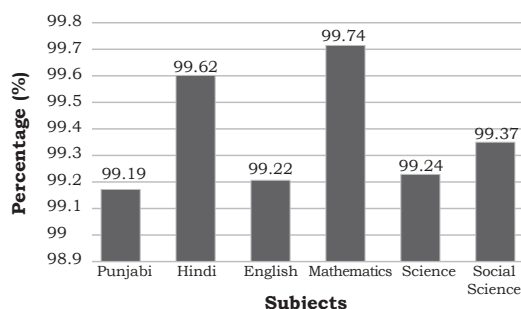
*Fig. 4: Subject-wise result of Grade 10 (2021–22)*

Source: Punjab Economic Survey (2022–23)

the Punjab Educare App, ensuring continuity of instruction and online monitoring during school closures. This adaptation not only prevented learning loss but also strengthened students' digital literacy and self-learning capacities—both integral to the PPPP framework.

#### *Senior secondary outcomes (Grade 12): Longitudinal comparison (2018–23)*

At the senior secondary level, PPPP's long-term impact was evaluated using PSEB board data from 2018 to 2023



*Fig. 5: Subject-wise result of Grade 10 (2022–23)*

Source: Punjab Economic Survey (2023–24)

across major subjects, including English, Mathematics, Science, and Social Studies (Refer: Figs 6 and 7).

- Between 2018 and 2023, the overall pass percentage for Grade 12 increased from 88.36 per cent to 96.95 per cent, reflecting a consistent improvement of nearly 9 percentage points.
- The distribution of top-performing students (A+ and A grades) widened across almost all disciplines, except for minor variations in Geography and Physical Education, where

performance slightly plateaued.

This steady progression demonstrates the sustainability of PPPP’s interventions beyond the primary stage. It also indicates that the foundational skills developed through early implementation (Grades 1–5) continued to yield dividends as students progressed through higher grades.

Importantly, the improvement in higher-grade results confirms that PPPP’s strategies—teacher professional development, regular testing, and skill-based instructional methods—had a cumulative and compounding effect on learning trajectories. The continuity of improvement across academic levels validates the longitudinal strength of the programme.

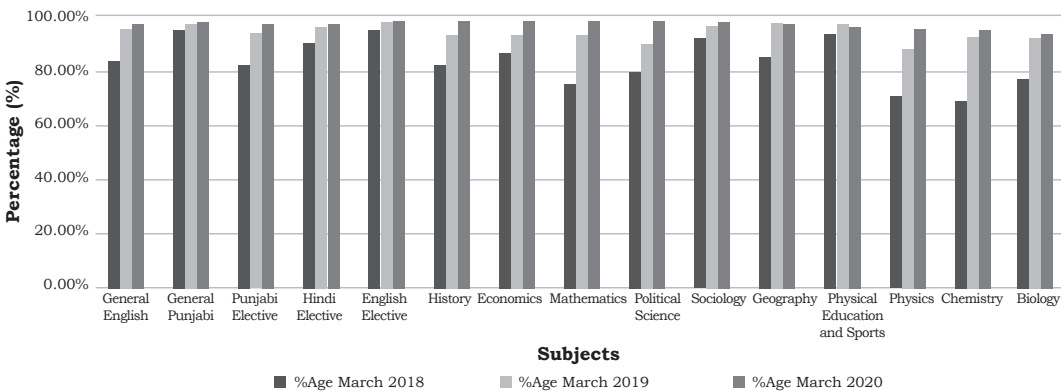


Fig. 6: Subject-wise result comparison of Grade 12 for 2018, 2019, and 2020

Source: pseb.ac.in

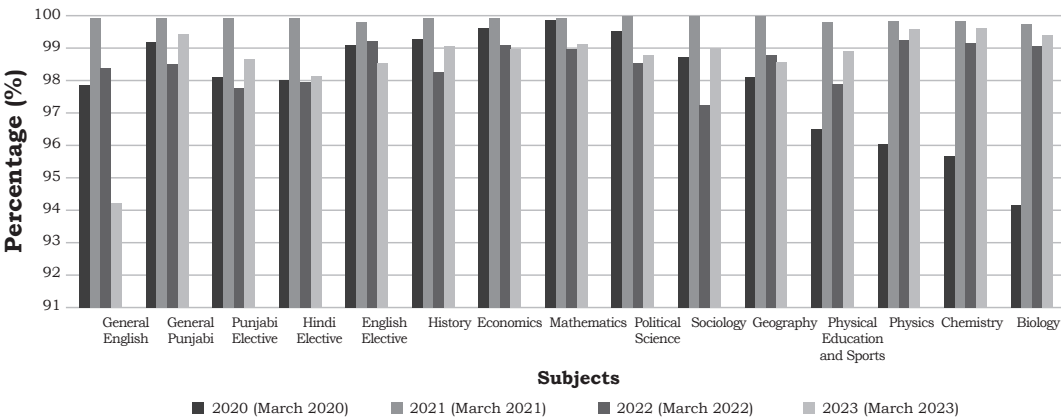


Fig. 7: Subject-wise result comparison (in percentage) for the years 2020, 2021, 2022, and 2023

Source: Punjab Economic Survey (2020–21, 2021–22, 2022–23, and 2023–24)

## **SUBJECT-WISE, GRADE-LEVEL LEARNING OUTCOMES**

### **Foundational Learning Outcomes (Grades 1–5)**

Baseline achievement improved from 45.51 per cent to 88.44 per cent. Students demonstrated stronger Punjabi reading fluency, English phonics, and arithmetic operations such as addition, subtraction, and division.

### **Upper Primary Outcomes (Grade 8)**

High achievers (A+ and A) increased from approximately 39 per cent to 52 per cent. English, Mathematics, and Science showed the sharpest gains, reflecting improved conceptual and applied understanding.

### **Secondary Outcomes (Grade 10)**

A+ and A performers rose from nearly 46 per cent to 64 per cent. Mathematics and Science achievements increased significantly due to activity-based learning and digital content support.

### **Senior Secondary Outcomes (Grade 12)**

The pass percentage increased from 88.36 per cent in 2018 to 96.95 per cent in 2023. Improvements in English, maths, and science indicate the sustained long-term impact of PPPP interventions

## **CONCLUSION**

The study concludes that the Parho Punjab Parhao Punjab (PPPP) programme has functioned as a comprehensive and systematically

implemented learning enhancement initiative that has significantly improved educational outcomes across grade levels in Punjab. The findings indicate that PPPP's outcomes are a direct result of its structured implementation mechanisms—teacher training, Mehal-based grouping, continuous assessment, digital integration, and monitoring. At the same time, the results highlight specific implementation gaps that must be addressed for long-term sustainability.

### **Strengthened Foundational Learning Through Structured Implementation**

The baseline–mid-test–post-test gains (from 45.51 per cent to 88.44 per cent) demonstrate that PPPP's pedagogy—particularly TaRL-based grouping, activity-based learning, and targeted remediation—successfully addressed early literacy and numeracy deficits. The Mehal System enabled teachers to tailor instruction to learning levels rather than grade expectations. However, variations across districts suggest uneven fidelity of implementation and a need for deeper support for teachers in remote or resource-poor schools.

### **Sustained Academic Growth Linked to Pedagogical and Administrative Interventions**

Improved outcomes for Grades 8, 10, and 12 between 2019–23 reflect the cumulative impact of foundational learning, ongoing assessments, and strengthened teacher capacity.

The increasing proportion of A+ and A grades indicates enhanced subject mastery. Nevertheless, disparities in performance between urban and rural clusters show that consistent monitoring and resource distribution remain critical.

### **Teacher Training as Both a Strength and a Challenge**

The cascading teacher training model played a crucial role in standardising instructional practices. Teachers adopted activity-based, experiential methodologies, and classroom engagement improved. Still, the cascading approach resulted in dilution of training quality at lower tiers, indicating a need for continuous mentoring, on-site academic support, and digital refresher courses.

### **Continuous Assessment Enabled Timely Feedback but Highlighted Capacity Gaps**

Baseline, mid-test, and post-test assessments created a robust feedback mechanism that improved instructional decision-making. Yet, some teachers reported difficulty in administering assessments efficiently and interpreting data, underscoring the need for simplified tools and capacity building in data literacy.

### **Digital Interventions Enhanced Reach but Exposed the Digital Divide**

The Punjab Educare App, Parho Punjab App, and e-Content supported learning continuity during COVID-19 and strengthened ICT integration.

However, inconsistent device availability, network barriers, and varying digital competence among teachers and parents emerged as limiting factors in fully realising digital learning benefits.

### **Systemic and Sustainable Impact with Notable Structural Challenges**

The upward performance trend from 2018 to 2023 confirms PPPP's potential as a long-term reform model. Nonetheless, sustained success requires continued investment in teacher support, monitoring teams, and infrastructure. The programme must also address implementation inconsistencies across districts to prevent widening disparities.

## **IMPLICATIONS**

### **Pedagogical Implications**

- PPPP shows that level-based teaching and activity-driven methods yield strong learning gains; however, they require regular teacher mentoring and reduced administrative load for teachers to be fully effective.
- The programme demonstrates the value of formative assessment and feedback loops, but also reveals the need for simplified assessment tools and support for teachers in data interpretation.

### **Institutional Implications**

- The monitoring system (state, district, and block levels) improved accountability but placed heavy demands on existing staff;

- future design must ensure balanced workloads and role clarity.
- Digital initiatives expanded access but highlighted infrastructural inequities across districts, signalling the need for targeted digital inclusion programmes.
- School-level implementation benefited from parental engagement and community participation, although participation levels varied significantly by region.

### Policy Implications

- PPPP aligns closely with Samagra Shiksha, NIPUN Bharat, and SDG-4 goals; however, policy must address variation in programme uptake, especially in marginalised communities.
- A state-wide data dashboard could improve real-time decision-making and ensure transparent monitoring across districts.
- Policies should mandate periodic external evaluations to prevent internal bias in programme reporting.

The analysis of the Parho Punjab Parhao Punjab (PPPP) scheme highlights several areas where implementation can be strengthened to enhance programme effectiveness and sustainability. First, there is a need to institutionalise continuous teacher coaching and mentoring rather than depending solely on one-time training workshops, as ongoing support is crucial for maintaining instructional fidelity.

Ensuring the effectiveness of the Mehal learning-level grouping system also requires stricter adherence to competency-based grouping rather than administrative convenience, supported by improved monitoring. Standardising assessment practices and digitising data collection would reduce teacher workload, minimise inconsistencies, and enable real-time progress tracking. To further improve PPPP interventions, digital infrastructure must be expanded through increased device access, reliable internet connectivity, and digital literacy training for teachers and parents. Supplementary materials should be diversified to include multilingual, inclusive, and contextually adapted content, ensuring relevance across diverse learner groups. Additionally, large schools would benefit from the deployment of teaching assistants to provide targeted academic support and reduce the burden on classroom teachers. At the policy level, Punjab's PPPP model could be scaled to other states, but such expansion must be contextually adapted to regional socio-economic and linguistic variations. Public-private partnerships can also play an important role in developing high-quality assessments, digital content, and teacher training modules. Vertical curricular alignment is essential to ensure that foundational learning gains at the primary stage translate into continued academic

progress in secondary grades. Finally, future research should focus on comparative evaluations of PPPP with other national and international programmes such as NIPUN Bharat and TaRL Africa, along with longitudinal tracking of student cohorts to measure long-term

learning retention and higher-order skill development. Studies examining teacher motivation, workload, and classroom climate would further illuminate contextual factors that influence the success of PPPP and similar large-scale learning reform initiatives.

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# Analysis of Current Teaching Practices in English Language based on Multiliteracies Pedagogical Framework for Language Learning

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## Abstract

*The present study analyses current English language teaching practices through the lens of the Multiliteracies Pedagogical Framework. Grounded in a dynamic approach to language learning, the multiliteracies framework recognises linguistic diversity and the increasing prominence of multimodal forms of meaning-making. Data were collected through semi-structured interviews with in-service government school teachers in Bhubaneswar and were analysed qualitatively across all four dimensions of the multiliteracies framework. The findings reveal that the English language teachers largely conceptualise literacy as the ability to read and write, with limited awareness of the multiliteracies paradigm, which foregrounds diversity, multimodality, and active meaning-making through design (Cope and Kalantzis, 2009). Although teachers demonstrate well-intentioned pedagogical practices, these are not fully aligned with contemporary educational demands. The study also identifies a lack of uniformity in English language instruction at the elementary level. While responses varied, teachers from central government schools displayed greater awareness of the aims of language education and adopted comparatively effective pedagogical practices than their counterparts in state government schools. The study highlights an urgent need to strengthen and harmonise the English language teaching practices to address the diverse linguistic and cultural backgrounds of learners. Enhancing alignment with the multiliteracies framework may contribute to more inclusive, meaningful, and future-ready language education.*

**Keywords:** Multiliteracies Pedagogical Framework, Situated Practice, Overt Instruction, Critical Framing, Transformed Practice

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## INTRODUCTION

Globalisation and rapid technological advancements have necessitated a shift in pedagogical practices to accommodate the evolving linguistic and cultural needs of learners. UNESCO (2023) conceptualises literacy not merely as the acquisition of reading, writing, and numeracy skills, but as the capacity for identification, interpretation, creation, and communication in a digitally mediated, information-rich, and rapidly changing world. Literacy today encompasses digital competence, media literacy, global citizenship, education for sustainable development, and job-specific skills, extending far beyond traditional definitions.

Contemporary research advocates the situated practice of language, where literary and non-literary texts are placed at the centre of classroom instruction (Kern and Schultz, 2005; Kern, 2008). Effective literacy learning now demands versatility, autonomy, intercultural competence, collaboration, and problem-solving abilities—skills essential for functioning in multilingual and multicultural environments (Navehebrahim, 2011).

Language learning is increasingly understood as a process of discovery, interpretation, and transformation of texts rather than mere replication of linguistic forms. Learners actively reanalyse language structures to create meaning in new contexts, integrating grammatical understanding organically within textual engagement (Cope and Kalantzis, 2009).

Such an approach necessitates instructional practices that acknowledge learners' socio-cultural identities and actively engage them in meaning-making (Pittaway, 2004).

In the Indian context, English language teachers are exposed to multiple approaches and methods—such as the Structural, Functional, and Communicative approaches, and methods including Grammar Translation, Direct, and Audio-lingual methods. However, no single approach adequately fulfils the comprehensive literacy goals outlined by UNESCO. Persistent ambiguity regarding the contextual appropriateness of these methods continues to challenge effective language pedagogy (Qing-xue and Jin-fang, 2007).

The New London Group (1996) introduced the concept of multiliteracies to address the growing disconnect between traditional language teaching practices and contemporary literacy demands. Emphasising linguistic diversity and multimodal meaning-making, the multiliteracies framework reconceptualises language as a means of accessing information, constructing knowledge, understanding socio-cultural realities, and participating meaningfully in society.

This perspective holds particular relevance for Indian classrooms, which are characterised by linguistic plurality, cultural diversity, and unequal access to resources. National policy documents, including the Learning Outcomes for Elementary Education (NCERT, 2017),

NEP 2020, and NCF-SE 2023, underscore multilingualism, cultural sensitivity, and critical thinking as core outcomes of language education. The multiliteracies pedagogy aligns closely with these objectives by promoting situated learning, socio-cultural relevance, multimodal engagement, and critical language awareness.

### **MULTILITERACIES PEDAGOGICAL FRAMEWORK (NEW LONDON GROUP, 1996)**

The Multiliteracies Pedagogical Framework is grounded in a dynamic, socio-cultural understanding of language learning, characterised by linguistic diversity and multimodal meaning-making. The meaning is constructed through interpretation, transformation, and recontextualisation of texts. The framework consists of four interconnected components.

#### **Situated Practice**

Learners draw upon their lived experiences, cultural backgrounds, and social identities to actively participate in classroom learning. This component strengthens connections between home, community, and school, and ensures that learners' voices are valued.

#### **Overt Instruction**

Teachers explicitly scaffold learning by guiding learners towards conceptual understanding and meta-linguistic awareness through structured support and illustrative examples.

#### **Critical Framing**

Learners critically analyse texts by situating them within social, cultural, political, and ideological contexts, fostering reflective and evaluative thinking (Mills, 2006).

#### **Transformed Practices**

Learners apply and redesign acquired knowledge in new contexts, demonstrating deeper understanding through creative and meaningful transformation of learning.

#### **RATIONALE OF THE STUDY**

In the contemporary world, literacy encompasses multiple dimensions, including digital, scientific, financial, cultural, and civic literacy. Multiliteracies pedagogy responds to this complexity by recognising diverse literacy practices and affirming learners' languages, cultures, and identities through participatory and collaborative learning.

Despite India's rich linguistic diversity, research on multiliteracies pedagogy in the Indian context remains limited. Existing studies suggest that multiliteracies can address challenges faced by multilingual learners and promote equitable and effective education (Mukhopadhyay, et al., 2019). Given the alignment of multiliteracies pedagogy with national education policies, there is a pressing need to examine current classroom practices through this framework.

This study seeks to bridge this gap by analysing elementary-level

English language teaching practices using the multiliteracies pedagogical framework, thereby offering insights into existing practices and potential pedagogical transformations.

### RESEARCH OBJECTIVE

To analyse current teaching practices in English at the elementary school level based on the four dimensions of the Multiliteracies Pedagogical Framework:

- Situated Practice
- Overt Instruction
- Critical Framing
- Transformed Practice

### METHODOLOGY

A qualitative research design was employed for the present study. 14 English language teachers from government schools in Bhubaneswar

were selected through purposive sampling. Of these, eight teachers were from Central Government Schools affiliated with the CBSE—namely Kendriya Vidyalaya Sangathan (KVS), Odisha Adarsha Vidyalaya Sangathan (OAVS), and D. M. Schools (DMS)—while six teachers were from State Government Schools affiliated with the State Board.

Data were collected using a semi-structured interview schedule developed by the researcher, incorporating all four dimensions of the Multiliteracies Pedagogical Framework. The interview schedule was prepared in consultation with subject experts to ensure content validity. Data analysis and interpretation were carried out qualitatively, guided by the four key dimensions of the multiliteracies pedagogical framework.

**Table 1**  
**Participants' Profile**

| Teachers | Designation | Experience | Gender | Affiliation |
|----------|-------------|------------|--------|-------------|
| T1       | TGT English | 3 Years    | Female | State Board |
| T2       | TGT English | 2 Years    | Female | CBSE        |
| T3       | TGT English | 5 years    | Male   | CBSE        |
| T4       | TGT English | 2 years    | Female | CBSE        |
| T5       | TGT English | 6 years    | Male   | State Board |
| T6       | TGT English | 17 years   | Male   | CBSE        |
| T7       | TGT English | 2.5 years  | Female | CBSE        |
| T8       | TGT English | 20 years   | Male   | State Board |
| T9       | TGT English | 16 years   | Male   | State Board |
| T10      | TGT English | 12 years   | Male   | State Board |
| T11      | TGT English | 4 years    | Female | CBSE        |
| T12      | TGT English | 2 years    | Female | CBSE        |
| T13      | TGT English | 3 years    | Female | State Board |
| T14      | TGT English | 7 years    | Male   | CBSE        |

**ETHICAL CONSIDERATIONS**

Informed consent was obtained from all the participating teachers prior to conducting the interviews. Participants were assured of the voluntary nature of their participation and their right to withdraw from the study at any stage. All personal and professional information provided by the participants was kept strictly confidential, and no identifying details were disclosed at any point in the research process. To ensure anonymity, the teachers were assigned coded identifiers ranging from T1 to T14 in all records and analyses.

**DATA ANALYSIS AND DISCUSSION**

The data were analysed qualitatively. The semi-structured interview schedule was designed to address all the four key dimensions of the Multiliteracies Pedagogical Framework—Situated Practice, Overt

Instruction, Critical Framing, and Transformed Practice—in order to compare and contrast existing English language teaching practices with this established pedagogical approach. The interview schedule consisted of a total of 20 questions, with five questions specifically aligned to each dimension of the framework. The responses were systematically analysed to identify recurring themes, patterns, and variations in teachers’ instructional practices across different school contexts.

**SITUATED PRACTICES**

**Teachers’ Understanding of Literacy and Multiliteracies**

Most teachers demonstrated a similar and conventional understanding of literacy, defining it primarily as the ability to read and write with basic comprehension. The concept of literacy was largely limited to

**Table 2**  
**Major Themes and Sub-themes for Analysis**

| <b>Situated Practices</b>                                         | <b>Overt Instructions</b>                                  | <b>Critical Framing</b>                                                     | <b>Transformed Practices</b>                                         |
|-------------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------------------|----------------------------------------------------------------------|
| Teachers’ understanding of literacy and ‘multiliteracies’ terms   | Teaching of language skills                                | Development of critical thinking and self-awareness                         | Transformed teaching and assessment practices                        |
| Experiential learning and students’ engagement                    | Teaching of grammar, vocabulary, and structure of language | Access and understanding of different forms of text (multimedia)            | Students’ role and autonomy in English language learning             |
| Multicultural and multilingual elements in the language classroom | Multimodality of teaching resources                        | Diversity in the purpose and context of literacy in a multicultural society | Integration of social and global themes in English language learning |

foundational language skills, and the term multiliteracies was unfamiliar to the majority of respondents.

Typical responses included statements, such as: “Literacy means the development of basic reading and writing ability, with an understanding of the concept.” “Literacy is learning to read, write, and understand.”

When asked about multiliteracies, teachers attempted to infer its meaning based on the term itself, offering speculative responses, such as “multiliteracies may be related to multilingualism” or “multiliteracies may be literacy about different contexts.” However, they were unable to clearly differentiate between literacy and multiliteracies.

Several teachers explicitly acknowledged that they had neither encountered the concept of multiliteracies during their pre-service training nor during in-service professional development programmes. One teacher remarked, “Multiliteracies might mean reading and writing simultaneously.” A few teachers assumed that multiliteracies referred to the existence of different types of literacy. One teacher said: “Literacy encompasses basic skills such as reading, writing, and speaking using correct grammar and vocabulary. I have not heard about multiliteracies, but it may suggest multiplicity of literacies. It might go beyond basic literacy skills to digital literacy or financial literacy. I am not sure, but I am interested to know more about it.” These responses indicate

that although teachers attempted to construct meaning from the term, there was a clear lack of conceptual understanding of multiliteracies as a pedagogical framework. The findings reveal a significant gap between contemporary literacy theories and teachers’ professional knowledge.

### **Experiential Learning and Students’ Engagement**

Teachers discussed a range of techniques and methods, used to promote experiential learning in the classroom. Most teachers from State Government schools reported following a traditional instructional approach, involving model reading of the text followed by translation into Odia. They explained that many students come from non-conducive home environments, are first-generation learners, and encounter English only after Grade 5. Consequently, students are often uncomfortable with direct English-medium instruction.

In contrast, teachers from central government (CBSE) schools reported using real-life examples to enhance students’ learning experiences. A few teachers indicated the use of multimedia resources, although this practice was limited. Only a small number of teachers consciously integrated students’ prior knowledge and lived experiences into classroom instruction. Among them, one teacher provided a concrete example: “I ask students to perform a role play on how we show respect to people according

to their profession. Students usually greet only teachers and not the *akkas* and *annas* (cleaning staff). This activity helps to integrate students' real-life experiences into the learning process."

With regard to student engagement, most teachers relied on grammar exercises, written assignments, and questioning techniques to maintain attention. One teacher stated, "I keep asking questions to ensure students are listening and following the lesson." Some teachers mentioned, using activity-based strategies; however, they noted that large class sizes and high student-teacher ratios made it difficult to engage all learners effectively.

Overall, classroom practices were largely textbook-centred, with occasional use of multimedia resources. Students' experiences and socio-cultural backgrounds were not consistently integrated into the teaching-learning process. The predominance of the grammar-translation method limited meaningful exposure to the target language. This finding is concerning, as the NCF (2005) emphasises learner-centred pedagogy and the importance of connecting classroom knowledge with learners' lived experiences.

Multiliteracies pedagogy advocates situated practice by integrating learners' local languages, cultures, and experiences through multimodal resources. Unlike traditional methods that rely primarily on written text

and translation, multiliteracies pedagogy employs diverse semiotic modes—linguistic, visual, auditory, gestural, and digital—to support meaning-making and enhance learner engagement (Cope and Kalantzis, 2009; Rahman *et al.*, 2000; Levy, 2000; Rajendram, 2018). Researchers strongly advocate situated language practices that establish meaningful connections between learners' prior knowledge and new learning (Kern and Schultz, 2005; Kern, 2008; Cope and Kalantzis, 2009).

### **Multicultural and Multilingual Elements in the Language Classroom**

Regarding the integration of cultural elements, most teachers reported relying primarily on textbook content and written assignments related to local festivals and traditions. Although teachers acknowledged opportunities to integrate cultural aspects into English lessons, they rarely provided concrete examples or described specific classroom strategies.

A few teachers mentioned incorporating discussions on textiles, folk art, paintings, and regional cuisines. One teacher offered a noteworthy example of teaching the poem "Wind" by relating its theme to super cyclones affecting the Odisha coast, thereby contextualising the text within students' lived experiences. However, the teacher also admitted that such integration of local culture is not a regular practice in English classrooms.

Most teachers stated that their primary focus was on developing LSRW (Listening, Speaking, Reading, and Writing) skills, and that multilingualism and cultural diversity were not central concerns. They acknowledged that many students struggle to comprehend and speak English, and therefore teachers occasionally use Odia or Hindi to support understanding. One teacher highlighted a regional practice in rural Odisha: “In tribal areas, teachers with knowledge of local dialects are often appointed so that they can address the multilingual needs of students.”

Another teacher noted that multilingualism has gained prominence following NEP 2020, particularly in central government schools where students come from diverse linguistic and cultural backgrounds. However, teachers also expressed scepticism about the practical implementation of multilingual pedagogy. One teacher remarked: “Students are more comfortable in Hindi than in English. I keep my instruction bilingual, but although multilingualism is discussed in policy, it is not fully practised in classrooms.”

While teachers acknowledged the importance of multilingual approaches, they were unable to articulate specific strategies for implementing them. Moreover, the discussions largely centred on local languages and cultures, with minimal attention to global cultural perspectives. Only one teacher reported introducing students to the

cultural contexts of foreign literary texts included in NCERT textbooks to foster global awareness.

Understanding the cultural, linguistic, and social contexts associated with a language is essential for meaningful language learning. The multiliteracies pedagogical approach promotes critical language awareness and enables learners to understand how language use varies across contexts and cultures (Mills, 2006; Schmerbeck and Lucht, 2017). The findings suggest that although teachers recognise the importance of cultural and multilingual dimensions, these elements remain underutilised in English language classrooms.

## **OVERT INSTRUCTION**

### **Teaching of Language Skills**

Teachers identified activities such as role play, debates, dramatisation, writing tasks, and model reading as means of developing language skills. However, no specific strategies were mentioned for listening skills development. Only two CBSE school teachers referred to conducting language lab sessions, though participation was reportedly low.

Teachers from state government schools cited inadequate resources and time constraints as barriers to adopting activity-based approaches. Several teachers acknowledged that sustained exposure to the target language is essential but difficult to achieve due to the absence of an English-proficient environment.

Consequently, instruction tended to prioritise reading and writing skills over listening and speaking.

Research indicates that multiliteracies-based instruction supports holistic language development by integrating multimodal and interactive practices (Arwita *et al.*, 2022; Nawawi and Christanti, 2020).

### **Teaching of Grammar, Vocabulary, and Language Structure through Overt Instruction**

Vocabulary instruction was largely textbook-driven, with teachers explaining new words and their usage. Grammar teaching focused on discussion and practice through written exercises such as fill-in-the-blanks and sentence correction. Teachers emphasised repeated practice and classroom participation to reinforce learning.

Differentiated instruction was limited due to time constraints, though teachers reported providing additional support to slow learners when needed. The findings highlight the need for student-centred, multimodal approaches that actively involve learners and promote responsibility for learning—key principles of multiliteracies pedagogy (Maesaroh and Muzayyin, 2022).

### **Multimodality in English Teaching**

Teachers' use of multimedia varied considerably. While some CBSE school teachers used audio-visual aids, presentations, and documentaries, most State Government school teachers

relied heavily on textbooks due to limited access to ICT resources. A few teachers shared digital worksheets via WhatsApp, while one experienced teacher demonstrated innovative use of concept mapping and multimedia integration.

Teachers also expressed concerns about insufficient professional training in multimodal pedagogy. Multiliteracies pedagogy addresses these challenges by promoting the integration of diverse semiotic resources—linguistic, visual, aural, and gestural—to enhance engagement and learning (Cope and Kalantzis, 2016).

## **CRITICAL FRAMING**

### **Development of Critical Thinking and Self-awareness**

Teachers reported fostering critical thinking through moral discussions, debates, brainstorming, and hypothetical situations. Some provided examples of addressing gender-bias and encouraging students to question social norms. However, explicit integration of critical societal issues and power dynamics was rare, as teachers prioritised syllabus completion.

While teachers acknowledged the importance of analysing media texts and real-world language use, such practices were not routinely implemented. The findings suggest limited awareness of the evolving role of language teachers. Multiliteracies pedagogy's critical framing supports the development of analytical skills

and critical language awareness by examining how language operates across contexts (Mills, 2006).

### **Access to and Understanding of Multimedia Texts**

Most teachers focused primarily on textbook-based instruction, citing time, and resource constraints. Engagement with alternative texts was limited, with newspaper reading mentioned mainly in assemblies. Only one teacher described integrating a media reference during classroom instruction.

Multiliteracies pedagogy emphasises engaging learners with diverse texts and media forms to develop critical and creative thinking, enabling students to connect language learning with real-world contexts (Cope and Kalantzis, 2009).

### **Diversity in Literacy Practices in a Multicultural Society**

Teachers generally admitted that multilingual, multicultural, and global perspectives were not systematically incorporated into English teaching. Although some recognised the potential of technology and alternative narratives, such practices were not part of regular instruction.

Given India's linguistic and cultural diversity, adopting multiliteracies pedagogy could address the needs of multilingual learners and promote global citizenship. Researchers emphasise its potential to make English language education more inclusive and contextually relevant

(Mukhopadhyay *et al.*, 2009; Nawawi and Christanti, 2020).

## **TRANSFORMED PRACTICES**

### **Transformed Teaching and Assessment Practices**

Some teachers reported incorporating inquiry-based learning, written and oral projects, and assignments that allow students to reflect on their language skills and creativity. However, responses regarding inquiry-based language learning were largely general, with examples primarily limited to pen-and-paper projects. One teacher noted that inquiry-based approaches are effective only for a few curious students, as most are hesitant to speak in English. Experiential learning is integrated wherever feasible, yet challenges persist, particularly regarding students' reliance on word-for-word translation of English texts.

Teachers described using activities such as role play, debates, and sentence correction to develop language skills and understanding of grammar and structure. Project-based assignments were often assigned during long holidays, with a few examples involving physical models, such as a model of a missile inspired by the lesson *The Missile Man of India*.

Regarding assessment, most teachers followed existing guidelines, allocating 80 per cent weightage to pen-and-paper tests and 20 per cent to participation, assignments, and oral evaluations. A few teachers mentioned innovative assessment

strategies such as self-assessment, peer assessment, and observational evaluation. One teacher described using weekly role play sessions as both a learning and assessment tool.

In alignment with NEP 2020 and NCF 2005, teaching and assessment should embrace contextual and interdisciplinary approaches. The multiliteracies framework supports diversity, multimodality, active meaning-making, and a holistic pedagogy. Assessment should be continuous and formative, moving beyond rote testing to incorporate multiple modes of meaning-making, creativity, and timely feedback (Cope and Kalantzis, 2009; Kalantzis and Cope, 2012).

### **Students' Role and Autonomy in English Language Learning**

Most teachers reported that the students view English as intimidating and primarily aim to pass examinations. Only a few students actively participated in classroom activities. Some teachers attempt to make students central to the learning process, but the foreign-language status of English in India leads to heavy reliance on teacher input.

A few teachers highlighted that assignments allow students some autonomy in thinking and writing. One teacher described soliciting students' preferences regarding lesson content, activities, and learning methods, though sometimes autonomy led to classroom disruption.

The findings highlight the need for well-prepared, skilled

teachers capable of fostering autonomy in multilingual contexts. Multiliteracies pedagogy ensures learning is meaningful, connects to students' experiences, and enhances their ability to construct knowledge, engage creatively, and take ownership of learning (Navehebrahim, 2011; Cope and Kalantzis, 2009). Such approaches encourage thoughtful, responsive, and future-oriented teaching (Boche, 2014; Nawawi and Christanti, 2020).

### **Integration of Social and Global Themes in English Language Learning**

Few teachers actively integrated social or global themes in classroom instruction. Some used debates, discussions, and written assignments to address social issues, while others relied solely on textbook content. One teacher emphasised including discussions on social justice but acknowledged limited engagement with global issues.

In the spirit of *Vasudhaiva Kutumbakam* ("the world is one family"), it is essential to cultivate students' understanding and respect for diverse cultures. Multiliteracies pedagogy, with its emphasis on multiple communication channels and cultural and linguistic diversity, offers opportunities to integrate social and global perspectives into English language learning. Language education should not only facilitate communication but also provide access to knowledge, contemporary information, historical

understanding, and opportunities for creativity and inspiration (Courtney, 1996).

### **RECOMMENDATIONS FOR POLICY REFORMS AND TEACHER PREPARATION**

- Introduce innovative pedagogies, including multiliteracies, into the teacher education curriculum.
- Pilot projects to evaluate the feasibility and effectiveness of multiliteracies pedagogy in Indian classrooms.
- Develop introductory modules for teachers on multiliteracies, integrating India's multilingual and multicultural contexts.
- Provide training for designing multiliteracies-based lesson plans covering all four key dimensions of the framework.
- Train teachers in the use of visual, audio, gestural, spatial, and digital tools for language instruction.
- Develop textbooks and supplementary resources aligned with multiliteracies pedagogy.
- Organise webinars and workshops to raise awareness and

understanding of multiliteracies practices.

- Encourage collaborative efforts to create both online and offline teaching resources.

### **CONCLUSION**

There exists a clear gap between current language teaching practices and the aspirations of a globalised, multilingual, and multicultural education system. To equip learners for global citizenship, education must foster critical thinking, autonomy, and ownership of learning. Diversity—both within India and globally—should be seen as a resource for developing skilled, adaptable, and culturally aware individuals.

Multiliteracies pedagogy offers a holistic approach to language education, integrating multiple modalities, cultural perspectives, and learner-centred practices. Further research is required to explore its adaptation and effectiveness in the Indian context. By embracing innovative pedagogical frameworks, we can create inclusive, engaging, and future-ready educational environments, that empower learners to thrive in an interconnected world.

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# From Vision to Policy

## A Critical Study of Swami Vivekananda's Educational Philosophy and Its Reflection in NEP 2020

PRIYADARSHINI\* AND NIKHIL YADAV\*\*

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### Abstract

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*The paper predominantly reflects upon the educational thought of Swami Vivekananda and its manifestation in the most recent National Education Policy 2020 (NEP 2020) of India. It is worth investigating the policy implementation of NEP 2020, which is inspired by Swami Vivekananda's holistic and value-oriented postulation, particularly concerning education, commonly articulated as "man-making education". The study aims to explore how the most discussed NEP 2020, as a policy, concretises Swamiji's emphasis on character building, self-reliance, and the integration of material and spiritual knowledge for an ardent learner. The research foregrounds qualitative methodology in philosophical analysis and policy critique. The work places primary texts from The Complete Works of Swami Vivekananda (CWSV) in dialogue with the NEP 2020. It further delves into Indian epistemological categories, such as neer-ksheer viveka and khandana-mandana, to enhance the NEP's call for critical thinking grounded in the ancient Indian knowledge system (IKS). The NEP 2020 marks a genuine departure from systemic colonial legacies rooted in Indian education, which is quite evident since the policy is talking enthusiastically about promoting Indian Knowledge Systems (IKS), experiential learning, and cultural contextuality. Taking note of Swami Vivekananda's contribution in shaping the latest policy on education, the paper situates Swami Vivekananda as an early theorist of IKS, whose educational insights align with contemporary debates on knowledge decolonisation, cultural sovereignty, and nation-building.*

**Keywords:** Critical Thinking, Indian Knowledge System, Man-making Education, National Education Policy 2020, Swami Vivekananda.

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## INTRODUCTION

India has a long tradition of education dating back to the ancient period when the 'gurukul' system was prevalent. This system promoted a sacred affinity between the *guru* (teacher) and *shishya* (disciple), where the learning process transcended mere academics and extended to holistic development, deeply situated in India's cultural and spiritual ethos. During this period, India was globally eyed as the prime hub of education, with prestigious institutions such as Takshashila, Valabhi, Nalanda, Sharada Peeth, and Vikramashila, attracting students from different parts of the world. These learning centres weighed intellectual pursuits with moral and spiritual growth, which mark the true principles of a holistic education system. Dharampal's (2000) research highlights that before the arrival of the British, India had a widespread and well-functioning education system that contributed to its intellectual prominence. Among several factors, it was India's intellectual tradition that drew individuals from around the world to visit the country and engage in its rich intellectual and philosophical heritage.

The NEP 2020 seeks to revive and rebuild upon this rich legacy by stressing the kind of education that is rooted in Indian culture, traditions, and ethos. In a marked shift from previous policies, NEP 2020 highly focuses on local contexts and indigenous knowledge systems. As outlined in NEP (2020, Section 4.27, p.16)

of the policy, all programmes and pedagogy, beginning with the foundational stage, will be redesigned to capture the Indian context in terms of culture, traditions, heritage, language, philosophy, and societal needs. This methodology aims to check that education is relatable and relevant to students, allowing the potential creativity and critical thinking to flourish when they are situated in the learners' cultural and geographical contexts.

Despite India's ancient educational glory, the preceding policies on education have been critiqued due to fostering incompetence, unemployment, skill gaps between academia and industry, and a lack of a practical skill set. It is believed that this gap can be addressed by implementing NEP 2020, which emphasises on experiential learning, skill development, character building, and nation-building activities. The new educational policy of India aptly captures the educational philosophy advocated by Swami Vivekananda, phrased as 'man-making education'. A kind of education that centres on the holistic development of individuals by fostering the physical, rational, logical, emotional, cultural and spiritual dimensions of an individual learner.

The philosophical vision on education proposed by Swami Vivekananda goes far beyond bookish knowledge and talks about bringing full attention to the development of character, self-reliance, and

practical skills. NEP 2020 takes inspiration from Swamiji's vision by advancing value-based, skill-based, and research-oriented education that can promote cognitive, emotional, and spiritual growth in an individual. The policy thus targets to empower individuals with the knowledge, skills, and values that are fundamental in building a strong, self-reliant nation. With such forceful emphasis on experiential and lifelong learning, NEP 2020 is seen by many as a transformative step towards realising Swami Vivekananda's vision of education. It can simultaneously address contemporary challenges in the Indian education system as well. The current study will critically examine Swami Vivekananda's educational philosophy and its reflection in NEP 2020.

## **METHODOLOGY**

This study adopts a qualitative research method, employing philosophical analysis, policy critique, and textual interpretation to critically examine the alignment between Swami Vivekananda's educational philosophy and India's NEP 2020. The research primarily draws upon two core sources—the official NEP 2020 policy document and CWSV (in nine volumes). To situate the analysis within broader academic discourse, the study incorporates an extensive review of secondary literature, including peer-reviewed journal articles, policy evaluations, scholarly critiques, and contemporary

commentaries on both NEP 2020 and Swami Vivekananda's educational thought.

## **LITERATURE REVIEW**

While Kaushik (2023) and Soy (2023) aptly establish a connection between NEP 2020 and Swami Vivekananda's educational idea, they mostly focused on "man-making education" and character-building. They have not explored how Swami Vivekananda actively engaged with and revived the Indian Knowledge System. There prevails a bridge between the broader epistemological, metaphysical, and pedagogical dimensions of Swamiji's educational philosophy. Jacob and Gaur (2024) and Bharadwaj and Pradeep (2023) duly emphasise the value-based and mass education and the character formation aspects of his education vision, but could not situate Swamiji in the context of current debates on cultural appropriation, global knowledge production, and postcolonial epistemic autonomy, which NEP 2020, in a way, addresses. Sharma (2023), in his chapter "Decolonising Indian Education: NEP 2020," strongly rethinks India's education system, by critically evaluating its colonial legacy, epistemological bent, and linguistic priorities as the medium of instruction. In dialogue with his argument, the present research further engages in the discussion by situating Swami Vivekananda's educational philosophy as a key precursor to the decolonial turn envisioned in NEP 2020.

While Sharma identifies the ideological mechanism behind the colonial continuity, this work focuses on the philosophical and pedagogical alternatives offered by Swami Vivekananda. Sharma's work provides the ideological and historical groundwork, while the current work complements it by elaborating on the philosophical and pedagogical substance for the implementation of the vision. Taking inspiration from this insight, the present study explores pedagogical emphasis, such as *nīra-ksīra viveka*, and the dialogical method of *khandana* and *mandana*, a method of critical thinking in IKS.

The current work draws from the educational philosophy of Swami Vivekananda and his interpretations to showcase how his early articulation of the IKS foresaw some of the core objectives of NEP 2020. By doing so, the paper positions him not merely as a social and spiritual reformer as perceived by the general population, but as an early IKS theorist and practitioner, inspired by Indian intellectual tradition. Unlike previous works of literature, the current paper tries to contextualise Swami Vivekananda's educational philosophy in a global and postcolonial discourse, connecting it to knowledge decolonisation, cultural sovereignty, and intellectual property covered in the discussion.

The current analysis explores the Vedantic fusion of spiritual (*aparā vidyā*) and material (*parā vidyā*) knowledge, highly talked about in classical Indian texts, and can be seen as a pedagogical model for twenty-first-century India. By employing the Indian epistemological categories of debate and discrimination, such as *neer-ksheer viveka* and the *khandana-mandana* technique, the work offers a culturally rooted alternative to critical thinking, strengthening NEP's emphasis on contextual education.

### SWAMIJI'S IDEA OF EDUCATION AND NEP 2020

Swami Vivekananda was one of the foremost *sannyāsis* who could realise the significance of education in the all-around development of an individual, as well as the Nation. Even though he graduated from a colonial-era institution (Eastern and Western Disciples, 1989, pp. 25, 46)<sup>1</sup>, he believed in a distinct philosophy of education that aimed to prepare individual learners into fully realised and self-reliant human beings. In addition to his formal Western education, Swami Vivekananda was firmly grounded in the indigenous knowledge traditions of India. He received his early instruction in the *Ramayana*, *Mahabharata*, *Bhagavatam*, and other sacred texts from his mother, Bhuvaneshwari Devi

<sup>1</sup> In 1871, he joined English Department of Pandit Ishwarchandra Vidyasagar's Metropolitan Institution and later in January 1880, he joined Presidency College as a student of Fine Arts. After a short time at Presidency College, he shifted to Scottish Church College (then General Assembly's Institution), where he completed his Bachelor of Arts (B.A.) degree in 1884.

(Eastern and Western Disciples, 1989, p. 14), and later attained deeper scriptural understanding and spiritual realisation under the tutelage of his guru, Sri Ramakrishna.

Swami Vivekananda envisioned a kind of education that can be seen as a potent tool in the Nation-building exercise. Education that can transcend the sheer accumulation of information. He believed in “Man-making Education,” which focuses on character-building, self-reliance, and manifesting the inherent potential of humans. According to his idea, education is not only about pouring knowledge into a learner; instead, it is more about awakening the inner strength and wisdom already present. His dynamic approach aligns with the core tenets of the NEP 2020 and seeks to bring a change in India’s education system for twenty-first-century learners. NEP 2020 is a path-breaking move toward realising Swami Vivekananda’s idea of education, underlining the development of individuals who are academically bright, ethically upright, and socially responsible. He famously stated, “Education is the manifestation of the perfection already in man” (Vivekananda, 2013, p. 349). According to him, education should not focus solely on the development of the intellect but on strengthening the person’s willpower and character. Education must strive to bring out the inherent strength of individuals and enrich them with values that can be imparted for the well-being of society.

This philosophy paved the foundation of the most celebrated phrase of Swami Vivekananda’s educational philosophy, “man-making education”. For him, education was a tool for self-realisation and social upliftment, which could lead to a stronger and more self-reliant nation. The NEP 2020 incorporates many of Swami Vivekananda’s educational ideals. If we closely examine NEP 2020, it centres around value-based education, skill development, and experiential learning, which are the core aspects of Swami Vivekananda’s vision. The recent education policy explicitly advocates for a kind of education system that is rooted in Indian culture and values, while also promoting twenty-first century skills and knowledge. It promotes the assimilation of diverse ideas, which is able to build both intellect and character. This aligns with Swami Vivekananda’s belief that “we must have life-building, man-making, character-making assimilation of ideas” (Vivekananda, 2013, p. 316).

The NEP 2020 further outlines that education must go beyond textbook learning to comprehend real-world experiences. It is by fostering rational and logical thinking, and practical skills, that the policy aspires to create citizens who are responsible and who can contribute to nation-building—an ideal that Swami Vivekananda visualised more than a century ago. For Swami Vivekananda, the teacher plays a crucial role in unlocking a student’s inner potential.

In his conversation with Shri Priya Nath Sinha, Vivekananda (2013, p. 370) observes that “The teacher spoils everything by thinking that he is teaching. Within man is all knowledge, and it requires only an awakening.” Such a view on the role of the teacher points toward “guidance” over “instruction”, where the educator can be seen as a mentor for learners to discover their inner strength and knowledge. NEP 2020 mirrors this idea by promoting the kind of pedagogical reforms that can prioritise active learning, mentorship, and a student-centric approach. It inspires teachers to become facilitators, who can guide the learners while exploring their innate abilities instead of solely passing the information.

Swami Vivekananda critiqued the education systems that focused solely on remembering facts, neither improving critical thinking nor real-world skills. He sided with secular knowledge, in modern terminology, experiential learning that keeps learners equipped with practical knowledge and improves their ability to apply it to whatever they learn. NEP 2020 emphasises experiential learning, skill-building, and real-world applications in the same manner. The policy introduced many naïve initiatives like internships, vocational training, and hands-on learning projects to make sure that students are not only informed but they are also prepared to cope with the demands

of the modern world. In the Union Budget for the fiscal year 2025–26, a noteworthy expansion of the Atal Tinkering Labs (ATL) initiative in schools was announced. According to PIB (2025), for the coming five years, the government has planned to establish 50,000 ATLs in government schools across India. This initiative will realise the government’s vision of creating a technology-driven and innovation-led economy, ensuring that students are turned into tinkerers and are well-equipped with the required skills to compete in a rapidly evolving global landscape. Like Swami Vivekananda’s vision, NEP 2020 seeks to pioneer graduates who are not only intellectually proficient but are also practically skilled and can readily contribute to society.

Swami Vivekananda was well aware of the fact that education not only shapes the individual, but also has a central role in the upliftment of the nation. He firmly believed that education should be tailored in a way that align with the broader needs and cultural values of the nation. This will add to both learners’ empowerment and national progress. At the core of Swami Vivekananda’s educational philosophy was the idea that education is fundamental for a strong nation. He envisioned an education that would produce individuals capable of uplifting society and who would lead India toward greatness. NEP 2020 is a realisation of this vision, since it gives importance to nation-building through education.

The policy aspires to train learners in a manner that they are able to live up to responsibilities in their communities, develop leadership skills, and contribute to national development. It can be summed up that by promoting a value-based, skill-driven education system, NEP 2020 seeks to empower learners with the knowledge, skills, and ethics necessary to build a self-reliant and prosperous India, just like Swami Vivekananda.

### **Material and Spiritual Knowledge**

Swami Vivekananda toured over a dozen Western countries<sup>2</sup> and with time, he came up with a wide-ranging perspective on education, which was informed by his exposure to Western and Eastern educational systems. Swami Vivekananda stressed the overarching features of both Western and Eastern knowledge systems. While Western education prioritises acquiring the material knowledge, the Eastern education system concentrates on the spiritual aspects of learning. For a strong nation, Vivekananda propose to apply the blend of Western and Eastern education. He gave prominence to educating the masses and the general public at large because he considered that Education is the only powerful instrument that can bring social transformation. He mentions,

“I consider that the great national sin is the neglect of the masses, and that is one of the causes of our downfall. No amount of politics would be of any avail until the masses in India are once more well educated, well fed, and well cared for” (Vivekananda, 2013, p. 215).

He advocated that the blend of *para* (material) and *apara* (spiritual) *vidya* (education) will certainly erase ignorance from the minds of the youth. Education here implies a kind of journey to encompass and experience the complete growth of an individual. It is not merely materialistic, but implies the development of the spiritual realm too. According to Swami Vivekananda, “No knowledge comes from outside—it is all inside. When we say a man “knows,” should, in strict psychological language, be what he “discovers” or “unveils”; what man “learns” is really what he discovers by taking the cover off his own soul, which is a mine of infinite knowledge” (Vivekananda, 2013, p. 30). Here, a Vedantin like Vivekananda emerges as a modern cognitive scientist, focusing solely on the mind as the subject of inquiry. He believed, “This is the systematic development of the mind. To me, the very essence of education is concentration of mind, not the collecting of facts. If I had to do my education over again

<sup>2</sup> Swami Vivekananda visited United States of America, England, France, Germany, Italy, Switzerland, Japan, China among others. These visits occurred during his two trips to the West between 1893–1896 and 1899–1900.

and had any voice in the matter, I would not study facts at all. I would develop the power of concentration and detachment, and then, with a perfect instrument, I could collect facts at will. Side by side, in the child, should be developed the power of concentration and detachment” (Vivekananda, 2013, p. 39). However, he asserts that this education must be combined with modern Western science. He himself poses this question—“Does higher education mean mere study of material sciences and turning out things of everyday use by machinery? The use of higher education is to find out how to solve the problems of life, and it was solved in our country thousands of years ago” (Vivekananda, 2013, pp. 371–372)<sup>3</sup>. He adds that Western countries are advanced in terms of scientific culture, but they are infants in the philosophical and spiritual realm. Vivekananda firmly believed that while Material science can only provide temporal prosperity, it is only the spiritual science that can be regarded as the essence of life (Vivekananda, 2013, pp. 394–395).

Against the backdrop of Swami Vivekananda’s philosophical thought, it becomes even more important to consider the most talked-about portion of NEP 2020. The significance of incorporating the IKS into India’s education framework, as advocated

by the NEP 2020. One of the rationales behind this emphasis stems from the fear that if India does not actively integrate and promote its traditional knowledge in educational curricula, it may risk losing ownership of its rich heritage. For reference, we can consider the case of turmeric being patented by foreign entities due to its medicinal properties, which have been in knowledge and used in India for centuries. It is a prominent example of how traditional knowledge of a region can be claimed or exploited by others if not protected and recognised by the local population itself. The NEP 2020 recognises that India’s vast knowledge systems, such as Ayurveda, yoga, philosophy, architecture, agriculture, and mathematics, are the repositories of knowledge that need to be researched, articulated, documented, studied, and transmitted to future generations. The policy also aims to modernise this knowledge and to make it relevant in contemporary contexts by integrating traditional wisdom with modern scientific approaches. If the Indian educational system ignores this responsibility, it risks allowing other countries or entities to appropriate, patent, or commercialise these ancient practices as their own. The example of turmeric refers to the potential dangers of cultural and intellectual misappropriation. In the 1990s, a patent was issued in the

<sup>3</sup> While this exact quote does not appear verbatim in the NEP 2020, its essence is reflected in several parts of the policy. Like, “The aim of education in ancient India was not merely the acquisition of knowledge as preparation for life in this world, or life beyond schooling, but for the complete realisation and liberation of the self (Vol. 5, Vivekananda, 2013) pp. 371–372.

U.S. for the use of turmeric in wound healing, despite its long-established medicinal use in India. It was the time when Indian scientists and legal experts had to challenge this, eventually succeeding in revoking the patent. Therefore, it is by stressing the inclusion of the IKS in education, NEP 2020 seeks to build a sense of pride among Indian students and scholars in their heritage, promoting further research and exploration in these areas. The inclusion of the IKS in education does not merely secure the continuity of India's intellectual heritage but also safeguards it against cultural appropriation and foreign exploitation.

### **INDIAN KNOWLEDGE SYSTEM (IKS) AND SWAMI VIVEKANANDA**

The IKS began to gain recognition as a distinct area of study in the early years of the third decade of the twenty-first-century, that is, after the NEP 2020. However, with his comprehensive understanding of IKS since the late nineteenth century, Swami Vivekananda played a central role in articulating and propagating its principles globally. Swami Vivekananda's lectures and discourses, delivered both in the Eastern and Western nations, encompassed a comprehensive exploration of the IKS, demonstrating his profound understanding and

global advocacy of its principles. The promotion of the IKS in NEP 2020 echoes Swami Vivekananda's powerful message,

“Give up these weakening mysticisms and be strong. Go back to your Upanishads—the shining, the strengthening, the bright philosophy. Take up this philosophy; the greatest truths are the simplest things in the world, as simple as your existence. The truths of the Upanishads are before you. Take them up, live up to them, and the salvation of India will be at hand” (Vivekananda, 2013, pp. 239–240).

We have yet to produce Polymaths of Indic Knowledge<sup>4</sup> from our modern institutions (Sharma, 2023, p.143). Until now, the Indian education system, a legacy of Macaulay's design, has been a much-celebrated colonial relic, built on the assumption of the “intrinsic superiority of Western literature, metaphysics, and science” (Macaulay, 1835/1958, pp. 107–117). However, the needs of postcolonial India have evolved, and in an era of the internet revolution and rapid global connectivity, the world has turned into a Global Village. India must decolonise its education system, if it is to reclaim its identity, assert itself on the global stage, and offer a vision for an alternative

<sup>4</sup> Like Aryabhatta, Baudhayana, Bhaskaracharya, Brahmagupta, Chanakya, Charaka, Dhanvantri, Gargi, Kanada, Mahaviracharya, Maitreyi, Nagachandra, Nagarjuna, Panini, Patanjali, Pingala, Sankardev, Sushruta, Thiruvalluvar, or Varahamihira.

world order. Bhattacharyya (1954) referred to this as the “slavery of the spirit”, which fostered a sense of inferiority, eroded memory and culture, introduced alien concepts, and imposed a hegemonic worldview. This resulted in a “shadow mind,” devoid of originality, unknowingly embracing intellectual imitation and mimicry—while diversity and plurality are the foundation of IKS. Previously, this has been overlooked in the chase for information and imitation of the West.

The NEP 2020 gives considerable emphasis on making the mother tongue a medium of instruction, alongside the promotion of Indian languages and the learning of foreign languages. The policy has recognised the deep connection between language and cognitive development, and it recommends that, wherever possible, education must be imparted in the learner’s mother tongue at least until Grade 8. Policymakers acknowledged the fact that the transition from English to regional languages in the classroom would not be quick; it is going to be gradual and challenging. To make this shift smooth, the policy advocates for the generation of high-quality bilingual textbooks and teaching aids, particularly for STEM (Science, Technology, Engineering, and Mathematics) disciplines, both in the mother tongue and English.

NEP 2020, taking inspiration from

Swamiji’s thought, emphasises that education is not just the transmission of knowledge but the awakening of the inherent potential within each individual. And for this instructor plays a very fundamental role. Swami Vivekananda writes, “The teacher spoils everything by thinking that he is teaching. Within man is all knowledge, and it requires only an awakening, and that much is the work of the teacher.” The moral integrity of the teacher is a cornerstone of effective education. This has been indicated in the Taittiriya Upanishad (1.11.6) (Lokeswarananda, 2010). The seer of Taittiriya Upanishad<sup>5</sup> also gives a list of the dos and the don’ts for a learner. Essentially, education was regarded as a journey toward knowledge (*Jñāna*), wisdom (*Prajñā*), and truth (*Satya*). These core ideals were upheld in the Mundaka Upanishad (1.1.4–5) as part of para *vidyā* (Nikhilananda, 1939). During the ancient tradition, the real objective behind education extended beyond the mere memorisation of facts. It aimed for holistic development and the final release of the self from all sorts of worldly bondages. In alignment with the ancient vision of Indian knowledge tradition, the NEP 2020 aims to integrate insights from Indian philosophy into prevailing educational practices. It advocates for a balance between both ancient knowledge systems and contemporary academic rigour.

<sup>5</sup> *Shiksha Valli*, Anuvak I–XI

## CRITICAL THINKING IN INDIAN TRADITION

The term “Critical Thinking” features prominently in the NEP 2020. Our ancient texts truly delineate the intent behind true education; it is intended that human beings are endowed with a sense of discrimination, what we describe as *neer-ksheer vivek*. “A swan is white, a crane is (also) white, then what is the difference between the two? When it comes to extracting milk from a mixture, a swan is a swan (a swan can extract milk and drink it), and a crane is a crane (a crane does not have this ability)” (Śankarācārya, 1921). It is this faculty of *vivek* (ability to distinguish between right and wrong) that makes an individual socially responsible.

One should not get swayed away by a fancy term and assume that adopting an idea from the West leads to neo-colonisation. In reality, while the concept of ‘critical thinking’ has evolved in the West over the past century, the Indian epistemological tradition has long been rooted in

a similar approach. It engages in rigorous discourse through the refutation of opposing arguments (*khandan*) and the defence or affirmation of one’s stance (*mandan*). Furthermore, Indian tradition differentiates between various forms of dialogue and debate based on their purpose, such as *Vāda*, *Jalpa*, and *Vitandā* (Sharma, 1993).

## CONCLUSION

In conclusion, the NEP 2020 embodies several core tenets of Swami Vivekananda’s educational philosophy. It aspires to transform the Indian education system by aligning it with ancient Indian knowledge tradition and contemporary needs. However, the successful realisation of its objectives necessitates sincere institutional commitment and meticulously crafted implementation strategies. A policy, however visionary, remains ineffectual if it fails to translate into tangible outcomes at the ground level.

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# Teachers' Readiness in Integrating ICT in Teaching and Learning in Rural Government Schools of India, Using Exploratory and Confirmatory Factor Analysis Approach

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## Abstract

*This study assesses teachers' readiness to integrate Information and Communication Technology (ICT) in rural government schools of India, with a focus on competency, attitude, and usage. Using a multistage stratified random sampling method, data were collected from 235 teachers across three Regional Institutes of Education (RIE)-adopted blocks, namely Ichhawar, Chillika, and Hurda. Exploratory Factor Analysis (EFA) identified key dimensions, including three competency factors (advanced pedagogical skills, basic ICT literacy, and peripheral handling), two factors each for positive and negative attitudes, and two types of ICT usage (instructional and administrative). Confirmatory Factor Analysis (CFA) validated the proposed model, demonstrating high reliability (Cronbach's  $\alpha > 0.86$ ).*

*The findings indicate that teachers possess basic ICT skills and generally hold positive perceptions regarding the educational value of ICT. However, the use of advanced digital tools, such as MOOCs and Free and Open-Source Software (FOSS), remains limited. Negative perceptions, including concerns about increased workload and reduced confidence, continue to impede deeper integration. ICT usage is largely confined to basic instructional purposes, with minimal application in administrative tasks. The study highlights the need for targeted capacity-building initiatives, enhanced technical support, promotion of FOSS, and institutional incentives. While rural teachers exhibit partial readiness for ICT integration, sustainable digital transformation requires comprehensive training, infrastructure development, and policy support.*

**Keywords:** Attitude, Teacher Competency, Exploratory and Confirmatory Factor Analysis, ICT Integration, Teacher Readiness

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## INTRODUCTION

Information and Communication Technologies (ICT) have been widely recognised as catalysts for educational advancement and the creation of inclusive knowledge societies, a theme consistently emphasised in UNESCO's EdTech-related documents over the past decade (Barakabitzte *et al.*, 2019; Kanvaria and Yadav, 2024; Ukpe, 2023). The Global Education Monitoring Report 2023 further identifies ICT and digital literacy as fundamental rights in the twenty-first century. ICT plays a pivotal role in enhancing educational quality (Das, 2019; Himanshoo and Sharma, 2015; Livingstone, 2012; Saravanakumar, 2018; Vitanova *et al.*, 2015) and improving the performance of both teachers and learners.

To harness the full potential of ICT, teachers must possess adequate digital competencies (Morris, 2010; Suárez-Rodríguez *et al.*, 2018; Williams *et al.*, 2000). Teachers' ICT proficiency and their perceptions of its relevance to teaching and learning are critical determinants of successful ICT integration (Gebremedhin and Fenta, 2015; Lawrence and Tar, 2018; Mirzajani *et al.*, 2016). Sampson and Fytros (2008) conceptualised competency as a set of personal attributes—including knowledge, skills, and attitudes—required to perform activities effectively in a given context. Similarly, Klein *et al.* (2004) define competency as an interrelated combination of knowledge, skills, and attitudes enabling individuals to meet occupational standards.

Previous studies have explored the impact of ICT on education across various contexts. Research on ICT competency has been conducted in Ethiopia (Demissie *et al.*, 2022), Spain (Díaz *et al.*, 2016), Norway (Elstad and Christophersen, 2017), Thailand (Raob *et al.*, 2012), Belgium (Aesaert *et al.*, 2017), North Macedonia (Vitanova *et al.*, 2015), and Germany (Rubach and Lazarides, 2021). Studies examining teachers' attitudes towards ICT integration span diverse geographical contexts, including Norway (Scherer *et al.*, 2015), Canada (Shapka and Ferrari, 2003), England (Robertson *et al.*, 1995), Syria (Albirini, 2006), Singapore and the UK (Teo and Noyes, 2010), Iran (Mirzajani *et al.*, 2016), and several European countries (Eickelmann and Vennemann, 2017).

Similarly, ICT usage in education has been investigated in Turkey (Tezci, 2011), Spain (Gil-Flores *et al.*, 2017), the Netherlands (Drent and Meelissen, 2008; Voogt and Knezek, 2011), and Belgium (Tondeur *et al.*, 2008; Vanderlinde *et al.*, 2014; Van Braak *et al.*, 2004). Although these studies provide valuable insights, most address ICT competency, attitude, or usage in isolation. There remains a paucity of research that simultaneously examines all three dimensions, particularly within the Indian rural school context.

To address these gaps, the present study aims to: (i) analyse teachers' competencies in integrating ICT into teaching-learning processes in RIE-adopted blocks of India;

(ii) explore teachers' attitudes towards ICT integration; (iii) evaluate teachers' reported ICT usage; and (iv) propose evidence-based policy recommendations to enhance teachers' readiness for ICT integration.

### **RATIONALE OF THE STUDY**

The integration of ICT in education has emerged as a global priority, particularly in developing countries such as India, where digital access and inclusion remain uneven. Teachers play a central role in translating technological potential into meaningful classroom practices. Their readiness—reflected in competencies, attitudes, and actual usage—largely determines the effectiveness of ICT integration.

Rural government schools face distinct challenges, including inadequate infrastructure, limited access to advanced training, and resistance stemming from low confidence or negative perceptions. While earlier studies have examined ICT competency, attitudes, or usage independently, few have adopted a holistic approach in the Indian rural context. By employing Exploratory and Confirmatory Factor Analysis, this study provides a comprehensive assessment of teachers' ICT readiness across three RIE-adopted blocks.

The findings reveal that although teachers demonstrate basic digital skills and generally positive attitudes, advanced competencies and innovative pedagogical or administrative applications remain limited. Concerns regarding workload

and self-efficacy further constrain ICT integration. Understanding these interrelated factors is essential for designing targeted professional development programmes and supportive policies. The study contributes empirical evidence from rural India to the global discourse on inclusive digital transformation in the education.

### **AIMS OF THE STUDY**

The aims of the study are as follows

- To analyse the competencies of teachers in integrating ICT in teaching-learning in adopted blocks of RIEs in India.
- To explore teachers' attitudes towards the integration of ICT in teaching-learning in the study area.
- To evaluate teachers' responses regarding their usage of ICT in teaching-learning in the study area.
- To suggest some effective policy recommendations based on empirical results to improve teachers' readiness in integrating ICT in Teaching and Learning.

### **RESEARCH QUESTIONS**

The research questions of the study are as follows

- What are the competencies of teachers in integrating ICT into teaching-learning in the adopted blocks of RIEs in India?
- What are the attitudes of teachers towards the integration of ICT in teaching-learning in the study area?

- How do teachers respond regarding their actual usage of ICT in teaching-learning in the study area?
- What effective policy recommendations can be derived from empirical results to improve teachers' readiness in integrating ICT into teaching-learning?

## DESIGN OF THE STUDY

### Sample Sites of the Study

The National Council of Educational Research and Training (NCERT), established in 1961, is an autonomous organisation under the Government of India responsible for advising on school education policies and programmes. NCERT undertakes research, develops educational materials, conducts teacher training, and disseminates educational innovations. As the nodal agency for implementing Sustainable Development Goal 4, NCERT also leads major ICT initiatives through the Central Institute of Educational Technology (CIET), including platforms such as DIKSHA and PM eVidya 200 DTH TV Channels (NCERT Annual Report, 2020).

NCERT operates through five Regional Institutes of Education (RIEs)—Ajmer (North), Bhopal (Central), Bhubaneswar (East), Shillong (North-East), and Mysuru (South). These institutes provide pre-service teacher education and support the implementation of national and state education policies. The present study was conducted as part

of NCERT-funded interventions in three RIE-adopted blocks—Ichhawar (Sehore district, RIE Bhopal), Chillika (Khordha district, RIE Bhubaneswar), and Hurda (Bhilwara district, RIE Ajmer).

According to Census 2011 data, literacy rates in Sehore, Khordha, and Bhilwara districts are 59.50 per cent, 77.71 per cent, and 52.15 per cent, respectively. National Gross Enrolment Ratios stand at 93 per cent at the Primary level and 77.40 per cent at the Secondary level (UDISE+ 2023–24). Pupil-teacher ratios range from 10 at the Foundational level to 21 at the Secondary level, while 38.87 per cent of female teachers and 29.67 per cent of male teachers have received training in computer-assisted teaching (UDISE+ 2023–24).

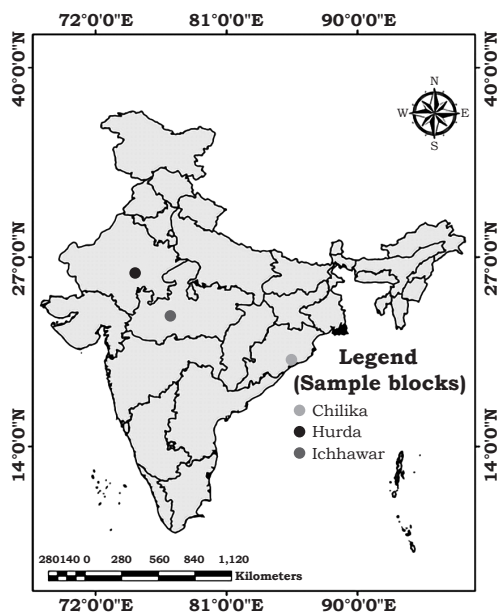


Fig. 1: Sample sites in different parts of India

**SAMPLE DESIGN PROCEDURE**

The present study draws on data collected from teachers under the project titled “Implementation of ICT Interventions: A Block-level Research Study”, conducted and funded by CIET, NCERT, between 2019 and 2023. A multi-stage stratified random sampling procedure was adopted for the study. Government school teachers from three blocks—Ichhawar, Khordha, and Hurda—constituted the sample.

**Stage 1**

In the first stage of sampling, states were selected based on the locations of the Regional Institutes of Education (RIEs). Initially, five states were identified; however, due to the unforeseen nationwide lockdown caused by the COVID-19 pandemic in March 2020, the data collection process was prematurely halted. Consequently, only three states—Madhya Pradesh, Rajasthan, and Odisha—were included in the study using purposive sampling.

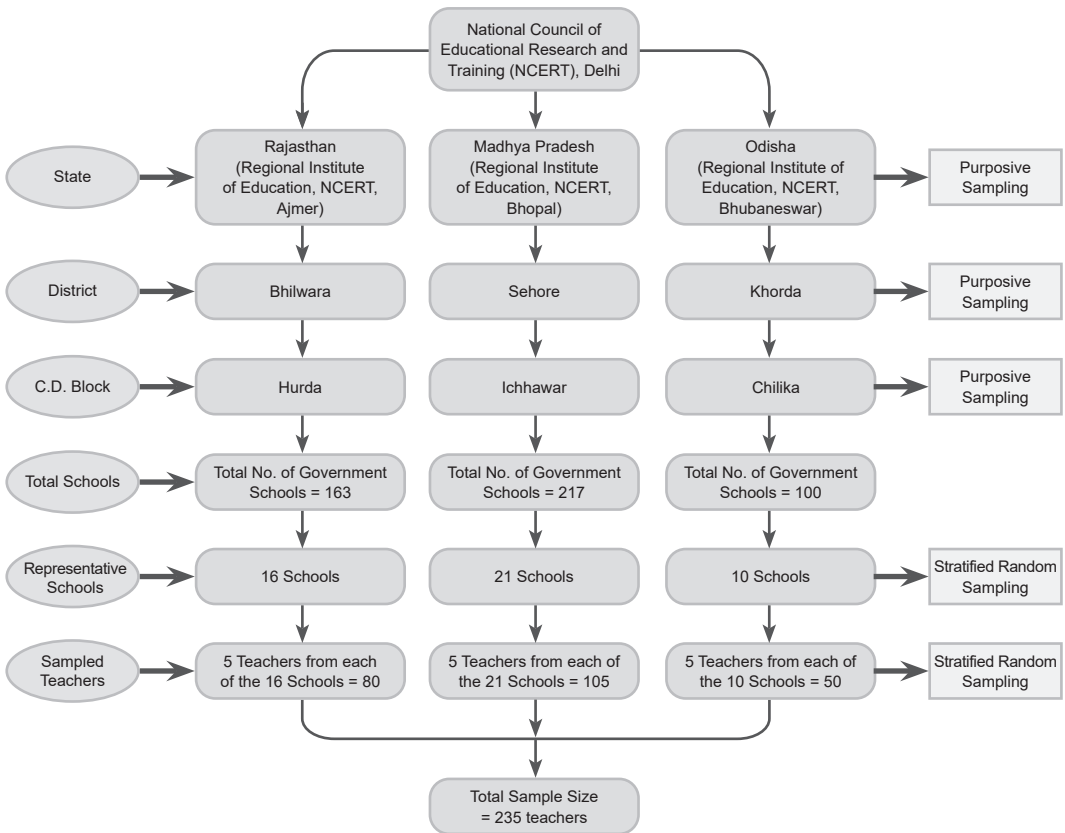


Fig. 2: Sample design

**Stage 2**

In the second stage, the districts and community development blocks within the selected states were chosen based on the established field contacts of the respective RIEs to facilitate access. Accordingly, purposive sampling was employed to select the community development blocks of Ichhawar, Hurda, and Chilika in the respective states.

**Stage 3**

At the third stage, schools were identified using stratified random sampling. 10 per cent of the total government schools from each selected community development block were included in the sample.

**Stage 4**

In the final stage, of the sampling procedure, 5 teachers from each school were selected using a random

**Table 1**  
**Socio-demographic Characteristics of the Respondents**

| <b>Demographic Variables</b>                          | <b>Frequency (f)</b> | <b>Percentage (%)</b> |
|-------------------------------------------------------|----------------------|-----------------------|
| <b><i>Gender</i></b>                                  |                      |                       |
| Male                                                  | 139                  | 59.15                 |
| Female                                                | 96                   | 40.85                 |
| <b><i>Age (in years)</i></b>                          |                      |                       |
| Less than 30                                          | 38                   | 16.17                 |
| 30–40                                                 | 68                   | 28.94                 |
| 40–50                                                 | 78                   | 33.19                 |
| 50 and above                                          | 51                   | 21.70                 |
| <b><i>Teaching Experience (in years)</i></b>          |                      |                       |
| 0–5                                                   | 54                   | 22.98                 |
| 5–10                                                  | 50                   | 21.28                 |
| 10–20                                                 | 62                   | 26.38                 |
| 20 and above                                          | 69                   | 29.36                 |
| <b><i>Level of Professional Education</i></b>         |                      |                       |
| No Degree                                             | 11                   | 4.68                  |
| Diploma/Certificate                                   | 104                  | 44.26                 |
| Degree                                                | 120                  | 51.06                 |
| <b><i>Experience of Using Computer (in years)</i></b> |                      |                       |
| Never used                                            | 114                  | 48.51                 |
| Less than 1 year                                      | 55                   | 23.40                 |
| 1–5 years                                             | 41                   | 17.45                 |
| 5–10 years                                            | 14                   | 5.96                  |
| More than 10 years                                    | 11                   | 4.68                  |
| N = 235                                               |                      |                       |

sampling approach. In this way, the total representative sample of teachers for this study was 235 (Fig. 2).

## METHOD OF THE STUDY

### Sources of Data

Both secondary and primary data were used in the present study. Secondary data sources included the Census of India (2011), NCERT Annual Report 2019–2020, UDISE+ 2019–20 Report, and UDISE+ 2023–24 Report. For the primary data, a survey was conducted using a pre-structured survey schedule administered to the selected teachers.

### Methodology

#### **Exploratory Factor Analysis (EFA)**

Exploratory factor analysis (EFA) is a multivariate statistical technique that plays a critical role in the development and validation of psychological theories and measurement instruments (Gorsuch, 1997; Ishiwatari *et al.*, 1991; Ponnampalnam *et al.*, 2014; Reio and Shuck, 2015; Watkins, 2018). In the present study, EFA was employed to identify latent variables underlying teachers' ICT competencies, attitudes, and usage patterns (Gebremedhin *et al.*, 2022; Reio and Shuck, 2015; Rönkkö and Cho, 2022; Ul-Hadia *et al.*, 2016).

The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was calculated for both individual items and composite factors, with values greater than 0.60 considered

acceptable (Gebremedhin *et al.*, 2022; Rönkkö and Cho, 2022; Ul-Hadia *et al.*, 2016). Item loadings above 0.30 are generally regarded as acceptable; however, in this study, a stricter loading criterion of  $\geq 0.50$  was adopted. This threshold was chosen to ensure stronger factor interpretability, particularly in cases where cross-loadings may occur, as items with higher loadings are considered more meaningful (Gebremedhin *et al.*, 2022; Rönkkö and Cho, 2022; Ul-Hadia *et al.*, 2016).

#### **Confirmatory Factor Analysis (CFA)**

Confirmatory factor analysis (CFA) is a hypothesis-testing technique that allows researchers to specify, estimate, and evaluate factor-analytic models (Marsh, 1994; Watkins, 1989). It enables the assessment of model fit and comparison of competing models using established goodness-of-fit indices (Goretzko *et al.*, 2024; Levine, 2005; Marsh, 1994; Watkins, 1989).

Although the chi-square statistic was computed, it was not used as the sole indicator of model fit due to its sensitivity to large sample sizes (Alavi *et al.*, 2020; Gebremedhin *et al.*, 2022; Hidayat *et al.*, 2018; Yokokura *et al.*, 2017). The Standardised Root Mean Square Residual (SRMR) was used as a primary fit index, with values between 0.00 and 0.05 indicating good fit and values up to 0.08 considered acceptable (Gebremedhin *et al.*, 2022; Goretzko *et al.*, 2024; Hidayat *et al.*, 2018; Lanasa *et al.*, 2009; Yokokura *et al.*, 2017).

Additionally, the Root Mean Square Error of Approximation (RMSEA) was employed, where values between 0.05 and 0.08 were interpreted as indicating an adequate model fit. Comparative Fit Index (CFI) values of 0.95 or above were considered indicative of good fit, while values between 0.90 and 0.95 represented acceptable fit (Gebremedhin *et al.*, 2022; Goretzko *et al.*, 2024; Hidayat *et al.*, 2018; Lanasa *et al.*, 2009; Yokokura *et al.*, 2017).

### RELIABILITY TEST

Following EFA, the reliability and internal consistency of the scales were assessed. Cronbach's alpha coefficient was calculated for the overall attitude scale as well as for the individual factors derived from factor analysis (Gebremedhin *et al.*, 2022). A Cronbach's alpha value greater than 0.70 was considered satisfactory, while values exceeding 0.90 were regarded as excellent (Gebremedhin *et al.*, 2022; Guillén-Gámez and Mayorga-Fernández, 2021).

In addition, McDonald's Omega coefficient was computed, as it provides a more accurate estimate of reliability when item loadings are uneven. Omega values above 0.70 were considered indicative of acceptable reliability (Guillén-Gámez and Mayorga-Fernández, 2021). Finally, Pearson's correlation coefficient was used to examine the relationships among the dimensions of the instrument (Guillén-Gámez and Mayorga-Fernández, 2021).

## RESULTS

### Results of Exploratory Factor Analysis

#### *Analysis of Teachers' Competency in ICT Integration*

To assess the suitability of the data for exploratory factor analysis, the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity were performed. The KMO value was found to be 0.949, which exceeds the recommended threshold of 0.60, indicating excellent sampling adequacy. Bartlett's Test of Sphericity yielded a chi-square value of 5894.20 with a significance level of  $p < 0.001$ , leading to the rejection of the null hypothesis and confirming the appropriateness of factor analysis.

The communality values for all competency items were above 0.30, indicating that the items shared sufficient common variance. Exploratory factor analysis was conducted on 26 items related to teachers' ICT competency, as illustrated in Fig. 3. The analysis revealed three distinct factors:

- F1: Advanced digital pedagogical competency
- F2: Basic digital and ICT operational skills
- F3: Computer and peripheral handling skills

Together, these three factors accounted for 69.78 per cent of the total variance. Factors F1 and F2 jointly explained 47.29 per cent of the total variance. As presented in Table 2, 24 items with factor loadings of  $\geq 0.40$  were retained in the final

model. Of these, nine items loaded onto F1 (advanced digital pedagogical competency), seven items onto F2 (foundational ICT literacy), and eight items onto F3 (computer and peripheral handling skills).

Varimax rotation was applied to facilitate interpretation of the factor

structure. Items with weak loadings ( $<0.50$ ) were excluded, resulting in the retention of 24 out of the original 26 items. No cross loading of items was observed, indicating a clear and stable factor structure for teachers' ICT competency in teaching and learning.

**Table 2**  
**Rotated Component Matrix of Factors for Competency**  
**in Integrating ICT in Teaching–Learning**

| Components |                                                                                                            | Factors |       |       |
|------------|------------------------------------------------------------------------------------------------------------|---------|-------|-------|
|            |                                                                                                            | 1       | 2     | 3     |
| Comp. 1    | Operating a computer (log in and log out)                                                                  | –       | 0.608 | 0.458 |
| Comp. 2    | Navigating in the operating system                                                                         | –       | 0.439 | 0.594 |
| Comp. 3    | Using Word processing like creating document, editing, inserting tables etc.                               | –       | 0.408 | 0.679 |
| Comp. 4    | Using spreadsheets like processing data, creating tables, graphs etc.                                      | –       | –     | 0.720 |
| Comp. 5    | Creating presentations like inserting images, videos, hyperlinks, animations, etc.                         | 0.501   | –     | 0.639 |
| Comp. 6    | Connecting to Internet in computers and smart phones                                                       | –       | 0.606 | 0.518 |
| Comp. 7    | Using e-mail, web surfing, and search engines like Google, Yahoo, Bing                                     | –       | 0.644 | 0.532 |
| Comp. 8    | Using social media such as Facebook, Twitter, LinkedIn, WhatsApp etc.                                      | –       | 0.733 | –     |
| Comp. 9    | Using virtual drives like Google Drive, SkyDrive, Dropbox                                                  | 0.415   | –     | 0.596 |
| Comp. 10   | Creating own Blog                                                                                          | 0.685   | –     | 0.474 |
| Comp. 11   | Creating multimedia presentations                                                                          | 0.614   | –     | 0.532 |
| Comp. 12   | Installing and uninstalling software applications                                                          | 0.527   | –     | 0.604 |
| Comp. 13   | Keeping the computer updated and secure from virus and malwares                                            | 0.533   | –     | 0.612 |
| Comp. 14   | Connecting and using computer peripherals (pen drive, hard disk, CDs, and DVDs)                            | –       | 0.505 | 0.656 |
| Comp. 15   | Connecting and using devices (speakers, digital cameras, printers, scanners, projectors and Mobile phones) | –       | 0.478 | 0.637 |
| Comp. 16   | Using smart phone                                                                                          | –       | 0.822 | –     |
| Comp. 17   | Downloading the mobile apps                                                                                | –       | 0.864 | –     |
| Comp. 18   | Creating resources (images, video, audio) using smart phones                                               | –       | 0.761 | –     |
| Comp. 19   | Using audio-visual communication like Messengers, SKYPE, tele-conferencing, etc.                           | 0.540   | 0.507 | –     |
| Comp. 20   | Using collaborative learning activities online like discussion forums, Google docs, etc.                   | 0.632   | 0.488 | –     |
| Comp. 21   | Abilities to navigate in a MOOC course                                                                     | 0.756   | –     | –     |
| Comp. 22   | Using Free and Open System Software (FOSS) like Geogebra, Audacity, Freeplane etc.                         | 0.817   | –     | –     |
| Comp. 23   | Preparing online quizzes and activities                                                                    | 0.730   | –     | –     |
| Comp. 24   | Using assistive technologies like Text to Speech, special softwares, tactile materials                     | 0.707   | –     | –     |
| Comp. 25   | Using Virtual and Augmented Reality (VR/AR) based resources                                                | 0.799   | –     | –     |

Source: Researcher — Primary Survey (N = 235)

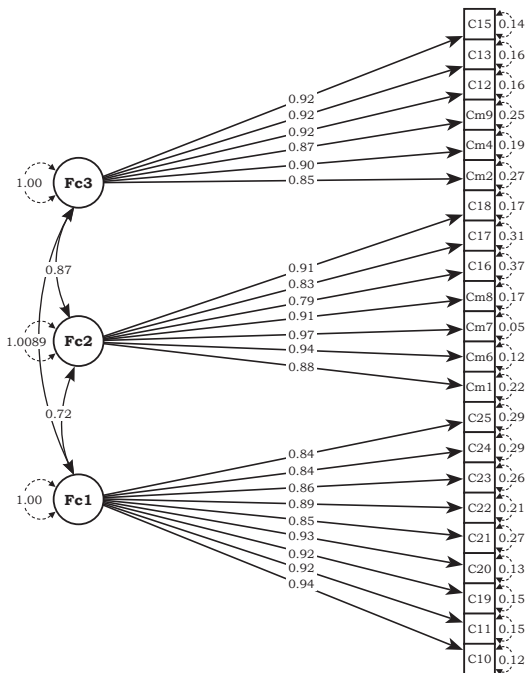


Fig. 3: Diagram for confirmatory factor analysis of competency

## ICT INTEGRATION: ATTITUDE OF TEACHERS

### Attitude based on Positive Statements towards the Integration of ICT in Teaching-learning

The KMO value was reported as 0.897, which is greater than the acceptable threshold of 0.60, indicating the suitability of the data for factor analysis. Bartlett's Test of Sphericity yielded a chi-square value of 1229.72

with a significance level of  $p < 0.001$ , leading to the rejection of the null hypothesis and acceptance of the alternative hypothesis. This confirms that the correlation matrix was appropriate for exploratory factor analysis.

The communality values for all items were within the acceptable range of  $> 0.30$ . Exploratory factor analysis was conducted on 12 items, as illustrated in Figure 4 and Table 3. The analysis revealed two factors, labelled as:

F1: Positive perception of ICT in teaching and professional growth, and

F2: ICT for engaging and empowering student learning.

These two factors together explained 44.65 per cent of the total variance. As shown in Table 3, all 12 items with factor loadings of  $\geq 0.40$  were retained in the final model. Of these, seven items loaded onto F1 (positive perceptions of ICT in teaching and professional growth), while five items loaded onto F2 (ICT for engaging and empowering student learning).

Varimax rotation was applied to facilitate interpretation of the factor structure and to obtain a clearer pattern of item loadings.

Table 3

### Rotated Component Matrix of Factors for Attitude based on Positive Statements towards the Integration of ICT in Teaching-Learning

| Components |                                                                  | Factors |       |
|------------|------------------------------------------------------------------|---------|-------|
|            |                                                                  | 1       | 2     |
| Att P1.    | Use of ICT in classroom helps in improving students' learning    | –       | 0.643 |
| Att P3.    | Use of ICT has an advantage over traditional methods of teaching | –       | 0.648 |

|          |                                                                             |       |       |
|----------|-----------------------------------------------------------------------------|-------|-------|
| Att P4.  | Use of ICT makes the subject more interesting                               | –     | 0.788 |
| Att P5.  | Use of ICT enhances independent learning among students                     | –     | 0.552 |
| Att P6.  | Use of ICT helps in dealing with heterogeneous group of students            | 0.472 | –     |
| Att P7.  | Use of ICT improves my job performance                                      | 0.717 | –     |
| Att P8.  | Using ICT is respected in professional circle                               | 0.749 | –     |
| Att P9.  | Use of ICT increases my efficiency as a teacher                             | 0.479 | 0.433 |
| Att P10. | Use of FOSS softwares are beneficial                                        | 0.539 | –     |
| Att P11. | Use of ICT saves the time due to availability of open educational resources | –     | 0.443 |
| Att P12. | Use of ICT makes sharing of ideas easier                                    | 0.658 | 0.419 |
| Att P13. | AUse of ICT makes the learner more divergent thinker                        | 0.511 | –     |

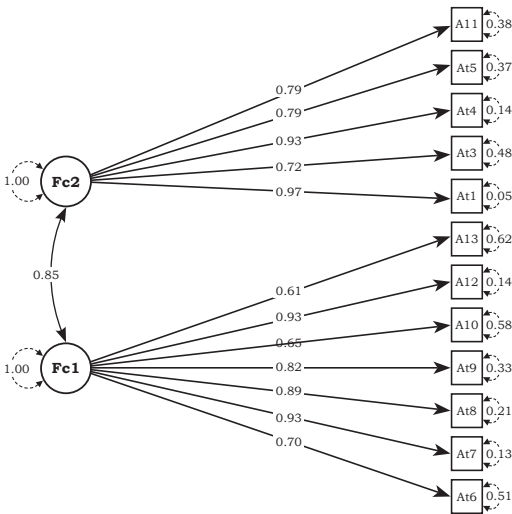


Fig. 4: Diagram for confirmatory factor analysis of positive attitude

**Attitude based on Negative Statements towards the Integration of ICT in Teaching-learning**

The KMO value was reported as 0.858, which is greater than 0.6, indicating the suitability of the model for factor analysis. Bartlett’s Test of Sphericity yielded a chi-square value of 1074.57 with a p-value <0.001, leading to

the rejection of the null hypothesis and acceptance of the alternative hypothesis. The communality values were within an acceptable range (> 0.3) for all items in the construct.

Exploratory factor analysis (EFA) was conducted on the 12 items and is illustrated in Fig. 5 and Table 4. The analysis revealed two factors, labelled as

F1: Perceived drawbacks and personal barriers to ICT use and

F2: Perceived professional and pedagogical threats of ICT. Together, these two factors explained 45.47 per cent of the total variance in the data.

As shown in Table 3, 10 items with factor loadings  $\geq 0.4$  were retained in the final model. Of these, six items loaded onto F1 (Perceived drawbacks and personal barriers to ICT use), while four items loaded onto F2 (Perceived professional and pedagogical threats of ICT). For factor extraction, varimax rotation was applied to identify the underlying item structure and facilitate interpretation.

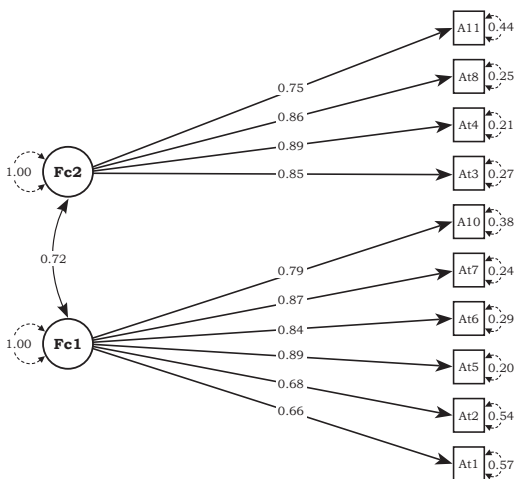


Fig. 5: Diagram for confirmatory factor analysis of negative attitude

**Table 4**  
**Rotated Component Matrix of Factors**  
**for Attitude based on Negative**  
**Statements towards the Integration of**  
**ICT in Teaching-Learning**

| Components |                                                  | Factors |       |
|------------|--------------------------------------------------|---------|-------|
|            |                                                  | 1       | 2     |
| Att N1.    | Use of ICT is a waste of time                    | 0.512   | –     |
| Att N2.    | Use of ICT encourages unethical practices        | 0.411   | –     |
| Att N3.    | Use of ICT makes me overburdened                 | –       | 0.750 |
| Att N4.    | Use of ICT creates anxiety                       | –       | 0.785 |
| Att N5.    | Use of ICT in classes makes me less confident    | 0.749   | –     |
| Att N6.    | Use of ICT complicates the task in the classroom | 0.742   | –     |
| Att N7.    | Use of ICT leads to frustration                  | 0.739   | –     |
| Att N8.    | Use of ICT makes students as passive listener    | 0.465   | 0.515 |
| Att N10.   | Use of ICT affects the health of a person        | 0.578   | –     |
| Att N11.   | Use of ICT reduces the importance of teachers    | –       | 0.688 |

### Analysis of teachers' responses on the usage of ICT in teaching-learning

To assess the suitability of the data for exploratory factor analysis (EFA), the KMO measure of sampling adequacy and Bartlett's Test of Sphericity were conducted. The KMO value was reported as 0.949, which exceeds the recommended threshold of 0.6, indicating that the data were suitable for factor analysis. Bartlett's Test of Sphericity yielded a chi-square value of 4379.89 with a p-value <0.001, leading to the rejection of the null hypothesis and acceptance of the alternative hypothesis. The communality values for all items were within the acceptable range (> 0.3).

Exploratory factor analysis was conducted on 23 items, as illustrated in Fig. 6 and Table 5.

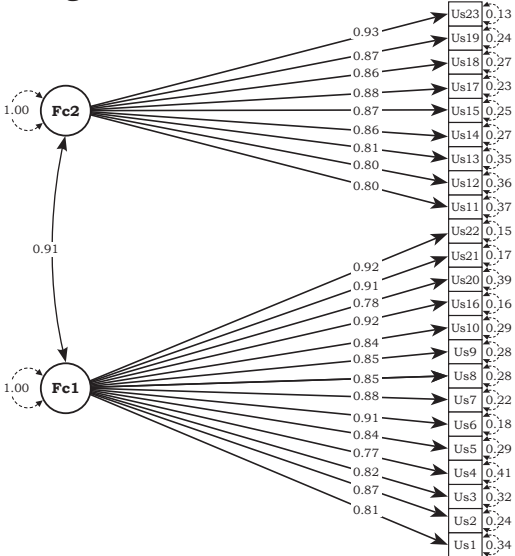


Fig. 6: Diagram for confirmatory factor analysis of usage

The analysis revealed two factors, labelled as

F1: Pedagogical use of ICT in classroom practice and

F2: Administrative and professional use of ICT. Together, these two factors explained 59.81 per cent of the total variance.

As shown in Table 5, all 23 items with factor loadings  $\geq 0.4$  were retained in the final model. Of these, 14 items loaded onto F1 (Pedagogical

use of ICT in classroom practice), while nine items loaded onto F2 (Administrative and professional use of ICT). Varimax rotation was applied during factor extraction to identify the underlying item structure and facilitate interpretation. Weakly loaded items ( $<0.5$ ) were excluded, resulting in a final set of 23 items related to teachers' integration of ICT in teaching-learning, with no cross-loadings observed.

**Table 5**

**Rotated Component Matrix of Factors for the Usage of ICT in Teaching-Learning**

| Components |                                                                                                           | Factors |       |
|------------|-----------------------------------------------------------------------------------------------------------|---------|-------|
|            |                                                                                                           | 1       | 2     |
| Usage 1    | I design my lesson on the basis of digital resources available.                                           | 0.714   | —     |
| Usage 2    | I plan online collaborative activities for my students                                                    | 0.690   | —     |
| Usage 3    | I search the relevant digital resources for my topic.                                                     | 0.630   | —     |
| Usage 4    | I develop my own digital resources for my classes.                                                        | 0.680   | —     |
| Usage 5    | I use Free and Open Source Software (FOSS) for making different digital resources.                        | 0.687   | —     |
| Usage 6    | I use ICT tools to make presentations in classroom.                                                       | 0.746   | —     |
| Usage 7    | I integrate ICT (audio/video/multimedia/websites) in my lesson while teaching                             | 0.753   | —     |
| Usage 8    | I communicate with my students using ICT tools, such as, e-mail, Google groups besides face-to-face mode. | 0.653   | —     |
| Usage 9    | I allow my students to employ ICT in various activities (Assignments, Projects, Teaching Aids )           | 0.729   | —     |
| Usage 10   | I prepare online quizzes and assessments for my students                                                  | 0.626   | —     |
| Usage 11   | I use email to communicate with the officials and colleagues                                              | 0.457   | 0.500 |
| Usage 12   | I create groups on social networking sites to communicate exam dates and assignments.                     | —       | 0.577 |
| Usage 13   | I use online spreadsheets to maintain attendance record of students and share it with my colleagues.      | —       | 0.724 |
| Usage 14   | I maintain result records of students through online spreadsheets.                                        | —       | 0.755 |
| Usage 15   | I schedule important events through online calendars.]                                                    | —       | 0.729 |
| Usage 16   | I use ICT to communicate with parents and community.                                                      | 0.588   | 0.577 |

|          |                                                                                       |       |       |
|----------|---------------------------------------------------------------------------------------|-------|-------|
| Usage 17 | I use ICT for admission and fees purposes                                             |       | 0.768 |
| Usage 18 | I use ICT to help school administration in day to day work                            | —     | 0.692 |
| Usage 19 | I use NROER/e-PATHSHALA/SWAYAM (MOOCs)/<br>SWAYAM PRABHA/online textbooks             | 0.525 | 0.534 |
| Usage 20 | I use Blended and Flipped learning methods to teach my topics                         | 0.515 | 0.426 |
| Usage 21 | I share my teaching resources through online Groups/Blogs                             | 0.610 | 0.536 |
| Usage 22 | I use ICT tools for doing research in education                                       | 0.609 | 0.568 |
| Usage 23 | I use online platforms for giving online presentations in<br>seminars and conferences | 0.525 | 0.584 |

## FINDINGS OF CONFIRMATORY

### FACTOR ANALYSIS

The findings of the exploratory factor analysis (EFA) indicated the presence of three latent factors within the competency dimension (Table 2). Confirmatory factor analysis (CFA) was therefore conducted to validate the factorial structure of competency in integrating ICT in teaching-learning and to examine the suitability of the proposed model based on the structure identified through EFA. The CFA results are presented in Fig. 3, where all factor loadings exceeded 0.5, ranging from 0.79 to 0.97. All factor loadings were statistically significant ( $p < 0.001$ ). The model fit indices indicated an acceptable overall fit ( $\chi^2 = 971$ ,  $df = 205$ ,  $p < 0.01$ ;  $RMSEA = 0.126$ ;  $CFI = 0.84$ ;  $TLI = 0.82$ ;  $SRMR = 0.0758$ ), suggesting sufficient goodness of fit.

The EFA results further revealed two latent factors within the positive attitude dimension (Table 3). To confirm the factorial validity of teachers' positive attitudes towards the integration of ICT in teaching-learning, CFA was performed. As shown in Fig. 4, all factor loadings

were greater than 0.5, ranging from 0.61 to 0.97, and were statistically significant ( $p < 0.001$ ). The model fit indices ( $\chi^2 = 137$ ,  $df = 53$ ,  $p < 0.01$ ;  $RMSEA = 0.082$ ;  $CFI = 0.927$ ;  $TLI = 0.909$ ;  $SRMR = 0.0512$ ) indicated an adequate model fit, demonstrating sufficient goodness of fit.

Similarly, the EFA results indicated the presence of three latent factors within the negative attitude dimension (Table 4). CFA was conducted to validate the factorial structure of negative attitudes towards ICT integration in teaching-learning. As illustrated in Fig. 5, factor loadings exceeded 0.5, ranging from 0.66 to 0.89, and all were statistically significant ( $p < 0.001$ ). The fit indices ( $\chi^2 = 132$ ,  $df = 34$ ,  $p < 0.01$ ;  $RMSEA = 0.111$ ;  $CFI = 0.894$ ;  $TLI = 0.86$ ;  $SRMR = 0.0728$ ) indicated an acceptable level of model fit.

Finally, the EFA results showed two latent factors within the usage dimension (Table 5). CFA was carried out to confirm the factorial validity of ICT usage and to evaluate the appropriateness of the proposed model. As shown in Figure 6, all factor loadings were greater than 0.5,

ranging from 0.77 to 0.93, and were statistically significant ( $p < 0.001$ ). The overall model fit was found to be adequate ( $\chi^2 = 827$ ,  $df = 229$ ,  $p < 0.01$ ;  $RMSEA = 0.105$ ;  $CFI = 0.861$ ;  $TLI = 0.847$ ;  $SRMR = 0.0549$ ), indicating sufficient goodness of fit.

## RELIABILITY ANALYSIS

The overall reliability of Model 1 for the competency dimension was assessed using Cronbach's alpha ( $\alpha$ ), which yielded a very high value ( $\alpha = 0.968$ ). Additionally, McDonald's Omega coefficient was computed and indicated excellent reliability ( $\omega = 0.969$ ). According to previous studies, a Cronbach's alpha value of  $\geq 0.70$  indicates acceptable reliability (Gebremedhin *et al.*, 2022; Guillén-Gámez and Mayorga-Fernández, 2021). Similarly, an Omega coefficient of  $\geq 0.70$  reflects acceptable and more precise reliability, particularly when item loadings are unequal (Guillén-Gámez and Mayorga-Fernández, 2021).

For Model 2, representing the positive attitude dimension, Cronbach's alpha was recorded as 0.868, and McDonald's Omega coefficient as 0.887, indicating satisfactory reliability (Tables 6 and 7). In Model 3, corresponding to the negative attitude dimension, Cronbach's alpha was 0.864 and the Omega coefficient was 0.868, demonstrating favourable reliability for model acceptance. In Model 4, representing the usage dimension, both Cronbach's alpha

and McDonald's Omega coefficients were recorded as 0.965, indicating excellent reliability (Table 7).

Pearson's correlation coefficient was employed to examine inter-item relationships within each dimension. Fig. 7 presents the correlation heat map, while the detailed correlation matrices are provided in Table 1 of the supplementary file. The results indicate that correlations among items within each dimension were positive and statistically significant.

In the first model (competency dimension), the highest correlation was observed between comp 15 and comp 14 ( $r = 0.85$ ), followed by comp 4 and comp 3 ( $r = 0.83$ ), comp 5 and comp 4 ( $r = 0.82$ ), and comp 17 and comp 16 ( $r = 0.82$ ). The lowest correlations were found between comp 21 and comp 16 ( $r = 0.19$ ), comp 22 and comp 17 ( $r = 0.19$ ), comp 22 and comp 16 ( $r = 0.21$ ), and comp 17 and comp 10 ( $r = 0.28$ ).

In the second model (positive attitude dimension), the highest correlation was observed between attp 8 and attp 7 ( $r = 0.71$ ), followed by attp 4 and attp 1 ( $r = 0.64$ ), and attp 12 and attp 7 ( $r = 0.61$ ). The lowest correlations were found between attp 13 and attp 2 ( $r = 0.01$ ), attp 13 and attp 3 ( $r = 0.14$ ), and attp 11 and attp 2 ( $r = 0.15$ ).

In the third model (negative attitude dimension), the highest correlation occurred between attn 4 and attn 3 ( $r = 0.68$ ), followed by attn 7 and attn 5 ( $r = 0.63$ ), and attn 7 and attn 6 ( $r = 0.62$ ).

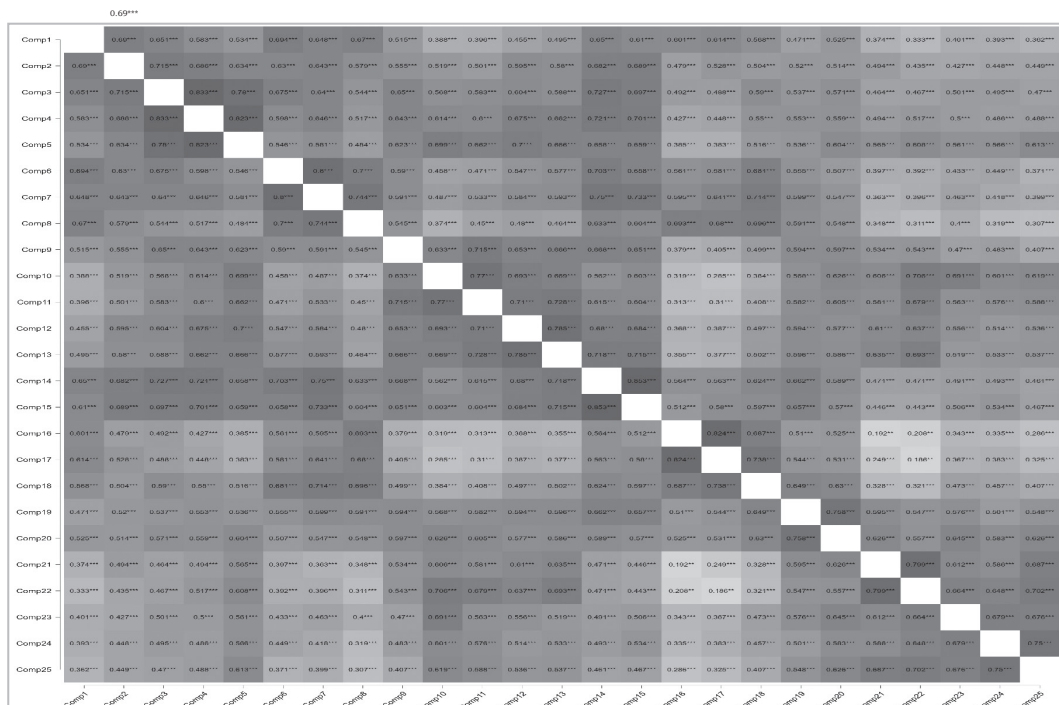
The lowest correlations were observed between attn 12 and attn 1 ( $r = 0.13$ ), and attn 3 and attn 1 ( $r = 0.15$ ).

In the fourth model (usage dimension), the highest correlation

was found between usage 22 and usage 21 ( $r = 0.78$ ), followed by usage 14 and usage 13 ( $r = 0.77$ ), usage 7 and usage 6 ( $r = 0.75$ ), and usage 8 and usage 7 ( $r = 0.72$ ).

**Table 6**  
**Fit Statistics of Tested CFA Models**

| Model  | Specification     | Chi Square ( $\chi^2$ ) |     |         | RMSEA  | RMSEA 90% CI |        | CFI   | TLI   | SRMR   | AIC  | BIC  |
|--------|-------------------|-------------------------|-----|---------|--------|--------------|--------|-------|-------|--------|------|------|
|        |                   | value                   | df  | P value |        | Lower        | Upper  |       |       |        |      |      |
| First  | Competency        | 971                     | 205 | <.001   | 0.126  | 0.118        | 0.134  | 0.84  | 0.82  | 0.0758 | 7297 | 7539 |
| Second | Positive attitude | 137                     | 53  | <.001   | 0.0821 | 0.0653       | 0.0991 | 0.927 | 0.909 | 0.0512 | 3783 | 3911 |
| Third  | Negative attitude | 132                     | 34  | <.001   | 0.111  | 0.091        | 0.131  | 0.894 | 0.86  | 0.0728 | 4634 | 4742 |
| Fourth | Usage             | 827                     | 229 | <.001   | 0.105  | 0.0977       | 0.113  | 0.861 | 0.847 | 0.0549 | 7553 | 7795 |



*Fig. 7: Correlation heatmap among the items under four dimensions for Competency*

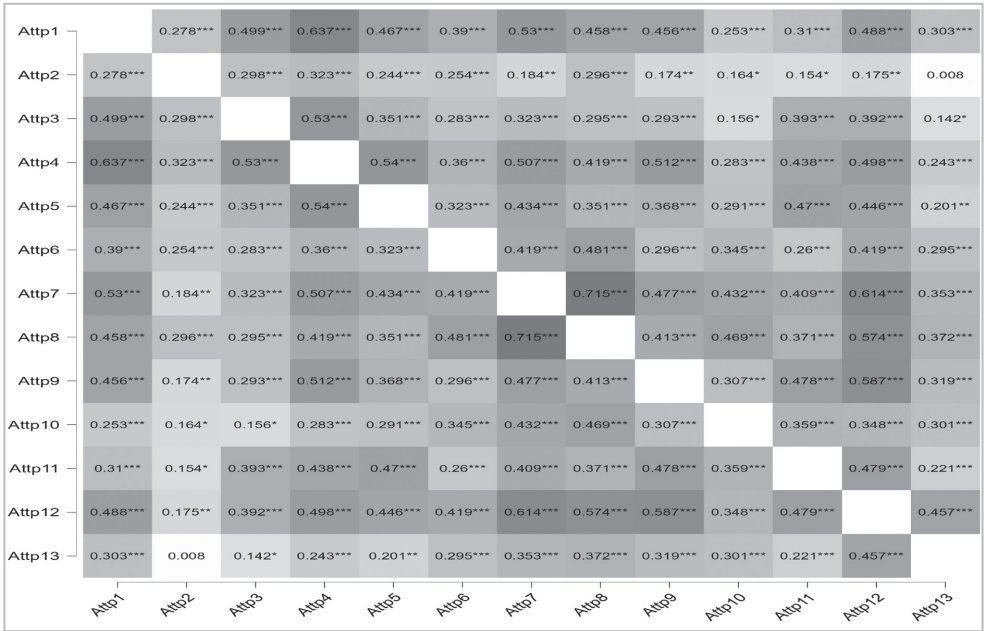


Fig. 8: Correlation heatmap among the items under four dimensions for Positive attitude

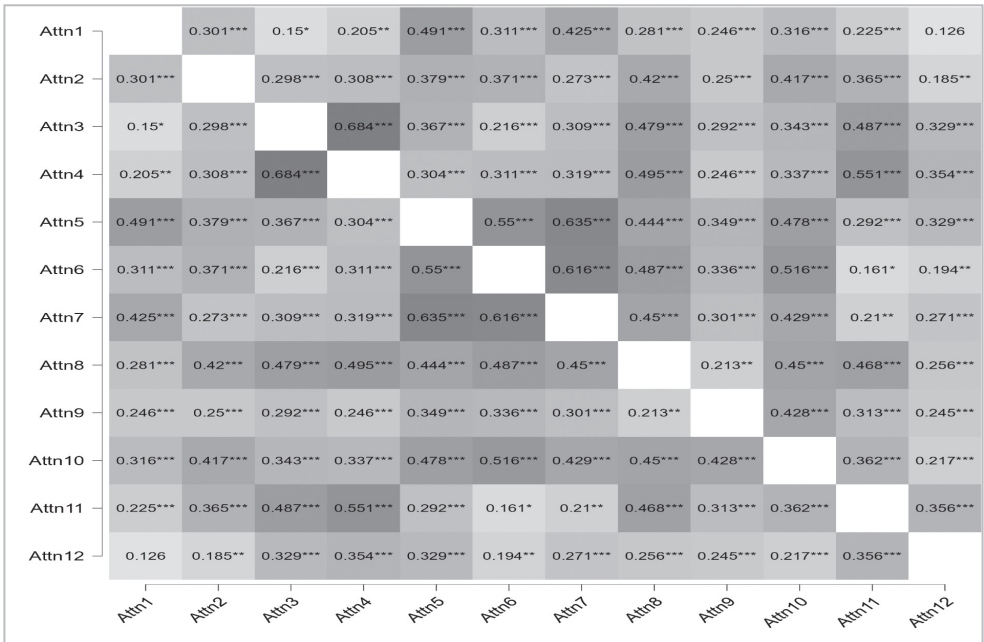


Fig. 9: Correlation heatmap among the items under four dimensions for Negative attitude

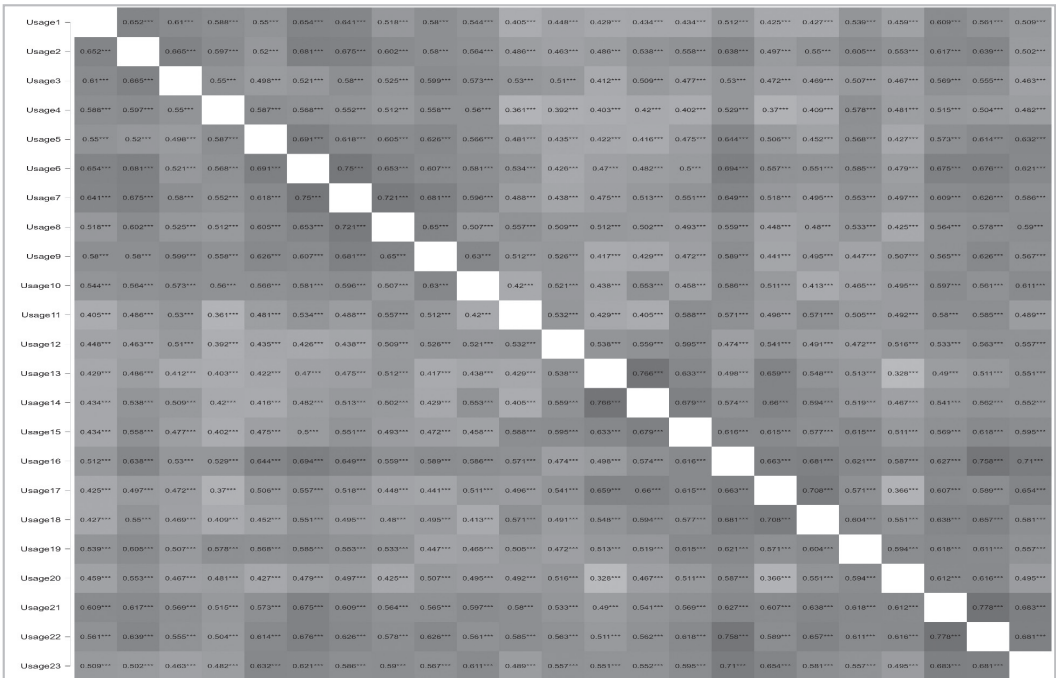


Fig. 10: Correlation heatmap among the items under four dimensions for Positive attitude

**Table 7**  
**Cronbach's Alpha Values of Four Factors in the Scale**

| Factors           | Mean | SD    | Cronbach's $\alpha$ | McDonald's $\omega$ |
|-------------------|------|-------|---------------------|---------------------|
| Competency        | 1.61 | 0.543 | 0.968               | 0.969               |
| Positive attitude | 2.66 | 0.374 | 0.868               | 0.887               |
| Negative attitude | 2.36 | 0.495 | 0.864               | 0.868               |
| Usage             | 1.5  | 0.512 | 0.965               | 0.965               |

**DISCUSSION**

This study examined teachers' readiness to integrate Information and Communication Technology (ICT) in rural government schools in India using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). The first objective focused on teachers' ICT competencies. The findings indicate that most

teachers demonstrated proficiency in basic and mobile-based digital tasks, such as using smartphones, accessing social media, downloading applications, and performing basic computing functions. These results are consistent with studies conducted in similar rural and resource-constrained contexts (Dahri *et al.*, 2023; Esmat and Amasha, 2025;

Khlaisang *et al.*, 2023; Thedpitak and Somphong, 2021).

However, a substantial skills gap was evident in advanced ICT competencies, including the use of Massive Open Online Courses (MOOCs), Open Educational Resources (OER), Virtual and Augmented Reality tools, and open-source content development. This gap reflects a persistent digital divide in the pedagogical application of ICT rather than in basic access or familiarity (Fonseca *et al.*, 2018; Mahbub *et al.*, 2024; Wang *et al.*, 2022). The EFA and CFA results validated three latent constructs—advanced digital pedagogical competency, basic ICT operational skills, and peripheral handling skills. Model fit indices (For example  $RMSEA = 0.126$ ,  $CFI = 0.84$ ) supported the structural validity of the competency framework. These findings highlight the need for professional development initiatives that extend beyond foundational ICT training and emphasise higher-order pedagogical skills aligned with twenty-first-century teaching and learning practices (Almazroa and Alotaibi, 2023; González-Salamanca *et al.*, 2020; Kong *et al.*, 2013; Ng *et al.*, 2023; Zhao *et al.*, 2023).

The second objective examined teachers' attitudes towards ICT integration. The results revealed generally positive attitudes, with teachers expressing strong beliefs in ICT's capacity to enhance learning outcomes, increase student

engagement, improve academic performance, and promote learner autonomy. These findings align with earlier studies suggesting that teachers increasingly view ICT as a transformative pedagogical tool (Barak, 2006; Kale and Goh, 2014; Kong *et al.*, 2013; Moreira-Fontán *et al.*, 2019). Nevertheless, comparatively weaker agreement was observed regarding ICT's role in managing classroom diversity, fostering divergent thinking, and supporting the use of Free and Open-Source Software (FOSS), indicating limited awareness of ICT's broader pedagogical potential.

Negative attitudes were primarily associated with concerns that ICT integration is time-consuming, increases instructional complexity, reduces teaching confidence, and may encourage unethical practices (Singun, 2025). In contrast, apprehensions regarding the diminishing role of teachers or adverse health effects were less pronounced, suggesting that resistance stems more from self-efficacy and institutional constraints than from the ideological opposition to ICT (Howard, 2013). CFA confirmed the two-factor structure of attitudes—positive and negative—with acceptable model fit ( $RMSEA = 0.082$  for positive attitudes and  $RMSEA = 0.111$  for negative attitudes). These findings reinforce existing literature emphasising that teacher attitudes play a mediating role in ICT integration and are shaped by both facilitating and inhibiting

factors (Akram *et al.*, 2022; Ertmer *et al.*, 2012; Hew and Brush, 2007; Raygan and Moradkhani, 2022; Shen *et al.*, 2024).

The third objective assessed teachers' actual usage of ICT in teaching-learning processes. The results indicate frequent use of ICT for sourcing digital content, implementing blended and flipped learning approaches, developing instructional materials, and facilitating communication through email and digital calendars. These practices reflect a growing orientation towards pedagogical ICT use and professional collaboration. However, limited engagement with open-source tools, online presentation platforms, and administrative ICT applications—such as student admissions and fee management—suggests a narrow scope of ICT utilisation. This restricted usage pattern underscores structural and institutional barriers that constrain broader integration.

EFA identified two usage-related factors—pedagogical usage and administrative or professional usage—accounting for 59.81 per cent of the total variance. CFA results confirmed the adequacy of the model ( $RMSEA = 0.105$ ,  $CFI = 0.861$ ). High reliability indices (Cronbach's  $\alpha$  and McDonald's  $\omega$ ) values exceeding 0.86) and strong inter-item correlations further supported the robustness of the measurement instrument. Collectively, the findings suggest a state of partial readiness—while foundational skills and favourable

attitudes are present, meaningful ICT integration remains limited by infrastructural deficits, insufficient technical support, and inadequate professional training. Addressing these challenges requires sustained capacity-building, institutional support mechanisms, and coherent policy implementation to enable effective ICT integration in rural education settings.

These findings align with the G20's 2023 priorities under India's presidency, which emphasise inclusive digital transformation through the development of Digital Public Infrastructure (DPI) in underserved regions (Ali and Kamraju, 2023; Kirton and Warren, 2018; Lyons *et al.*, 2019). Teachers' limited advanced ICT skills and low engagement with FOSS mirror priority areas identified by G20 initiatives, which advocate capacity-building, international collaboration, and inclusive pedagogical innovation through digital technologies. The presence of strong positive teacher attitudes offers a critical foundation for scalable interventions. Aligning national education strategies with G20-endorsed practices—such as strengthening digital infrastructure, embedding ICT in classroom pedagogy, and cultivating digital leadership among teachers—can accelerate India's transition towards a more equitable and digitally inclusive education system, consistent with the G20's vision of “One Earth, One Family, One Future.”

## CONCLUSION

This study employed exploratory and confirmatory factor analysis to assess teachers' readiness to integrate Information and Communication Technology (ICT) in rural government schools in India. The analysis identified three key dimensions of readiness—ICT competency, teacher attitudes, and actual ICT usage. While many teachers demonstrated basic digital skills—such as operating smartphones and using simple applications—their proficiency declined while engaging with advanced technologies, including MOOCs, open-source software, and Virtual or Augmented Reality platforms. EFA revealed three underlying competency domains—foundational ICT literacy, advanced pedagogical competencies, and peripheral handling skills. CFA results confirmed the validity and reliability of this measurement model.

Teachers generally exhibited positive attitudes towards ICT, recognising its potential to enhance student engagement and learning outcomes. Nevertheless, concerns related to increased workload, reduced confidence, and classroom management complexities, indicate persistent psychological and institutional barriers. These mixed attitudes underscore the importance of policy approaches that simultaneously reinforce motivation and address structural constraints.

In terms of practice, ICT usage remained largely confined to

pedagogical functions such as accessing digital content and employing blended learning approaches, with limited adoption of administrative and higher-order instructional applications. This disparity between positive attitudes and constrained usage suggests that teachers' readiness is shaped not only by willingness but also by the availability of resources, training opportunities, and institutional support.

Overall, the study reveals a partial yet promising level of ICT readiness among teachers in rural government schools. Advancing beyond basic ICT use requires a comprehensive strategy encompassing targeted capacity-building, improved infrastructure, continuous professional development, and systemic institutional support. Such integrated efforts are essential for fostering meaningful, sustained, and contextually relevant ICT integration in rural education systems in India.

## POLICY RECOMMENDATIONS

To address the challenges associated with ICT integration in rural and resource-constrained educational contexts, the following globally relevant policy recommendations are proposed:

### Implement Globally Aligned ICT Training Programmes

Governments should introduce structured ICT training programmes

for teachers and school leaders aligned with international frameworks, such as UNESCO's ICT Competency Framework. These programmes should prioritise pedagogical integration and digital leadership, with particular attention to rural and marginalised settings.

### **Mainstream Free and Open-source Software (FOSS)**

Integrate FOSS training into national ICT programmes to ensure cost-effective digital access. Free & Open-Source Software (FOSS) refers to its systematic integration into teacher training. School ICT infrastructure and classroom practices as a cost-effective alternative to proprietary software. This includes equipping teachers with the skills to use and adapt open tools (For example, GeoGebra, Audacity) for pedagogical purposes, thereby enhancing accessibility and flexibility in resource constrained setting. Furthermore, promoting South-South cooperation involves fostering collaboration among developing countries to share knowledge, best practices and Scalable models for FOSS adoption, ensuring contextually relevant and sustainable digital integration in education system.

### **Ensure Equitable ICT Access through Partnerships**

Bridging the rural-urban digital divide requires a sustained investment in affordable digital infrastructure, such as smartphones, tablets, and low-bandwidth technologies. Governments should leverage public-private partnerships and international development assistance to expand ICT access in underserved regions.

### **Promote Context-sensitive ICT Pedagogical Research**

Policymakers should support evidence-based research on digital pedagogical models, including blended, flipped, and mobile learning, to assess their effectiveness across diverse educational and cultural contexts and to inform adaptive ICT policies.

### **Harness Positive Teacher Attitudes for ICT Adoption**

Teachers' favourable attitudes towards ICT should be strategically leveraged to drive adoption. Linking attitudinal readiness with skill development initiatives can inform the design of responsive professional development programmes and infrastructure policies tailored to varied educational contexts.

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# Exploring Attitude Towards English Language Learning Among Secondary School Students

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## Abstract

*Language has been identified as the most significant source of communication through which human beings share thoughts and ideas with each other. Being proficient in English, along with one's mother tongue, is an instrumental tool to tackle the progressing globalised world. The purpose of the study is to analyse the influence of gender and medium of instruction on Attitude towards English Language Learning among secondary school students. A descriptive survey method was followed to collect relevant information from a sample of 223 secondary school students. The Secondary Students' Attitude towards Learning English Language Scale was adapted to collect data from the sample. One-sample t-test and test of significance of difference between means for large independent samples were used to analyse the data. The results indicated that secondary school students have an average level of Attitude towards English Language Learning. It was also found that female students and secondary school students studying in English medium schools have a higher Attitude towards English Language Learning than males and those studying in Malayalam medium.*

**Keywords:** Attitude, English Language Learning, Secondary School Students

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## INTRODUCTION

Language has been identified as the most significant source of communication through which human beings share thoughts and ideas with each other. Among the thousands of languages across the world, be it national languages or local languages, the global stature

of the English language cannot be undermined. The English language is the first language of over 350 million people and a second language to around 430 million people worldwide (Ilyosovna, 2020). Even with the numerous diverse languages, the pervasive influence of the English language cannot be ignored.

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English has been identified as a key to better education and career opportunities (Ahmad, 2016).

According to Shobikah (2017), the world is in the era of globalisation and every individual is supposed to make provisions with reliable resources, particularly in the area of communication. As such, the English language is necessary to master communication technology and for interaction. Along with one's mother tongue, being proficient in English, a second language, is an instrumental device to tackle the progressing globalised world. It is also to be noted that comprehending English should not be connected with the extinction of a native language; it must be associated with a tool to compete with the globalised world.

The English language is a quintessential factor in the higher educational sectors and also for specialised training programmes. Numerous books on different subjects are mostly available in English or being translated to English. English is the language of instruction in most universities and higher education institutions worldwide (Reddy, 2016). The English language is the only language that has been in use for the major sectors like education, science, technology, business, medicine, entertainment, and information and the like (Srinivas, 2019).

English language learning has been identified as an essential component of academic success (Fadhil *et al.*, 2025; Pasupuleti *et al.*,

2024). India's success in IT and other outsourcing industries is largely attributed to the English proficiency of its citizens; India's emphasis on English language learning on all levels of education has equipped its students to thrive and succeed in technological and international business arenas (Rajitha, 2024). Being proficient in the English language has been linked to enhanced career growth and future endeavours (John *et al.*, 2021). Again, it is linked not only to enhancing verbal and written communication skills of learners but also contributes to leadership, teamwork, and confidence; hence, early English language education would be beneficial to learners for reaping long-term benefits (Hayati, 2015).

## **NEED AND SIGNIFICANCE OF THE STUDY**

Various factors affect the English language education of learners (Zhao *et al.*, 2024). Psychological factors like motivation, self-efficacy, cognitive ability, and other familial and societal factors interact and influence English language learning among the learners (Zhao *et al.*, 2024). According to Hanus (2019), a positive student-teacher relationship in culturally inclusive classrooms can enable better language learning environments. Yet again, parental involvement in the form of encouragement, where they set high educational expectations and a home environment facilitating language learning, indeed has

a direct influence on learners (Butler, 2014). In his seminal work *Principles of Language Learning and Teaching*, Brown (2000) emphasises the role of effective factors such as motivation, anxiety, self-confidence, and attitude as essential components to acquire language more effectively. Socio-cultural factors influencing language learning have been discussed by several researchers. Factors such as religion and social customs prevalent in a culture can be of strong influence, either facilitating or hindering second language acquisition, because learners will have to confront the cultural differences in their native language and target language (Budhe, 2020). Attitude has been identified as a very important socio-cultural variable that is influential in acquiring a second language (Tawfiq, 2020). Sailaja (2015) noted that attitude is an important component of language learning, specifying that a positive attitude towards a specific subject can enable students to achieve higher success in that area.

An attitude may be defined as a disposition to respond favourable to unfavourably towards a group of objects (Sarnoff, 1960, as cited in Greenwald, 1968). Attitudes are deliberate evaluations of particular phenomena that are overtly expressed (Arendt *et al.*, 2019). Attitude was defined as a psychological tendency which is inferred through evaluating a specific entity with a certain degree of either favour or disfavour

(Eagly and Chaiken, 1993, as cited in Haddock and Maio, 2008). Attitude and performance have been claimed to mutually influence, such that achievement affects attitude and attitude affects achievement (Amoo and Rahman, 2004, as cited in Rahman, 2019).

Ahmed (2015) noted that the learners had a positive attitude towards learning English and opined that those students were more likely to be bilingual. It was also pointed out that the reason behind learning was primarily for proper communication with foreigners. Though Getie (2020) observed a positive attitude of learners towards English language learning—certain educational factors, like teachers and learning environments, negatively affected students' attitude towards English language learning. It was also claimed that attitude should be an essential part of second language learning pedagogy since students' attitude is an important part of learning.

Huwari (2021) studied the attitude of Jordanian students towards the English language, and a medium level of attitude was found. The study denoted a higher level of attitude among female students than their male counterparts. According to Li *et al.* (2025), communicative activities are closely related to gender stereotypes, with girls often showing stronger interest and motivation in expressive tasks. Vidic (2021) acknowledged that the female students generally portray higher cognitive, behavioural,

and emotional engagement than male students, which suggests that learning tasks are shaped by gender expectations and classroom experiences.

At the same time, the use of learners' mother tongue in classrooms can provide emotional security and the required scaffolding, which reduces anxiety and fosters confidence in English language learning (Alshayban and Alghammas, 2021). Mageshwari and Selvakumar (2023) were of the opinion that even though high school students' mother tongue usage could have a negative impact on the English language learning, it did not matter for the academic success of the learners. Kumar (2019) highlighted that learners' mother tongue interference can highly hinder English language learning unless it is supported by communicative strategies like reading comprehension, summary writing, and translation, which could bring awareness of the differences between English and the mother tongue, thereby enhancing linguistic development. Thus, it could be said that attitudes toward English language learning are not shaped by a single variable but emerge from the interplay of mother tongue, gender, and wider socio-cultural factors, as revealed through the different research studies.

Learners' positive attitude towards English language learning was indicated by various researchers (Yuliani *et al.*, 2023; Dadi, 2018; Borja, 2016). Contrastingly, Asghar

*et al.* (2016) noted that students have a negative attitude towards English language learning. Snoubar (2017) pointed out that EFL students had a medium level of attitude towards English language learning, while Alaga (2016) noted a high level of attitude among the learners, which was an essential factor for the learners' use of the English language.

Anuradha and Rengaraj (2017) conducted a study on attitude towards English language learning among a sample of 40 higher education students in Chennai. It was found that boys and girls from an English medium background, aided schools, private schools, and girls from exclusively girls' schools had a higher positive attitude towards English language learning than the regional medium students. Lampa *et al.* (2024) investigated the attitude towards English among the students of senior secondary schools in Arunachal Pradesh. The study asserted that the students have a high level of attitude towards the English language learning, but they observed no significant difference in the attitude of students with regard to gender. While studying the anxiety of higher education students of Andhra Pradesh towards the English language, Gajalakshmi (2013) indicated that the high school students in the Puducherry region showed significant differences in their attitude towards English language learning with respect to gender, in which boys portrayed a higher attitude towards English than their female counterparts. Vidhya

*et al.* (2021) studied the difference in attitude towards English language learning among the higher education students of Tamil Nadu based on their locale and gender. The study observed significant differences in the students' attitude towards English learning, based on their residential locale rather than their gender.

Various studies on attitudes towards English language learning revealed that attitudes highly influence the achievement of students. Additionally, researchers have portrayed discrepancies in attitude towards English language learning among students. Hence, a study on attitude towards English language learning has various scopes. It is indeed important to identify the attitude of the learners and to tailor it in effective ways to cater to the global communicative goals and to promote culturally and socially integrative societies. In addition to that, new strategies in English language pedagogy can be implemented in the English language classrooms.

### **OBJECTIVES OF THE STUDY**

- To find out the level of Attitude towards English Language Learning among secondary school students.
- To find out whether there exists a significant difference in Attitude towards English Language Learning among secondary school students for the sub-groups based on gender.
- To find out whether there exists a significant difference in Attitude towards English Language Learning

among secondary school students for the sub-groups based on the medium of instruction.

### **HYPOTHESES OF THE STUDY**

- There is no significant difference in the mean scores of Attitude towards English Language Learning among secondary school students for the sub-groups based on gender.
- There is no significant difference in the mean scores of Attitude towards English Language Learning among secondary school students for the sub-groups based on medium of instruction.

### **METHODOLOGY**

#### **Method**

A descriptive survey method was followed as the study aimed to analyse the Attitude towards English Language Learning of secondary school students. The investigator approached the head of the high schools selected for seeking prior permission to collect the necessary data. While collecting the data from the students, the investigator informed the students of the purpose and procedure of responding.

#### **Sample**

The population for the study comprised of those students who are studying in the secondary schools of Kerala state. The sample for the study consisted of 223 students, of whom 100 were male, and 123 were female, studying in Grades 8 and 9 of various

secondary schools in Kozhikode and Malappuram districts of Kerala state.

**Instrument**

The instrument used to collect the data was adapted from the Secondary Students’ Attitude towards Learning English Language Scale (Manehri, 2022). It was a five-point Likert scale ranging from ‘strongly agree’ to ‘strongly disagree’. Originally comprising of 38 items, the tool was modified to 26 questions and translated into Malayalam in order to better suit the specific context of the present study, while preserving the integrity of the original tool. It was reviewed by subject experts to ensure semantic equivalence and content validity. The concurrent validity of the tool was found to be 0.79, and the reliability of the scale was 0.89.

**Statistical Techniques Used**

A one-sample t-test was used to find the level of Attitude towards English Language Learning of secondary school students. The test of significance of difference between means of large independent samples (t-test) was used to determine whether there exists any significant difference in the mean scores of levels of Attitude towards English

Language Learning of the secondary school students based on gender and medium of instruction.

**RESULTS AND DISCUSSION**

**Level of Attitude towards English Language Learning of Secondary School Students**

The first objective of the study was to find out the level of Attitude towards English Language Learning among secondary school students. The level of Attitude towards English Language Learning of secondary school students was determined by using the mean and standard deviation. Descriptive statistics of the scores of Attitude towards English Language Learning are given in Table 1.

**Discussion of Objective 1**

Table 1 shows that the mean scores of Attitude towards English Language Learning of secondary school students are 96.79, and the standard deviation is 13.38. The score on Secondary Students attitude towards Learning of English language scale ranges from a minimum of 26 to a maximum of 130. The neutral value of the Secondary Student’s Attitude towards Learning English Language Scale is 78. The mean score obtained for Attitude

**Table 1**  
**Descriptive Statistics of the Scores of Attitude towards English Language Learning of Secondary School Students**

| Variable                                   | N   | Mean  | Median | Mode | SD    | Skewness | Kurtosis |
|--------------------------------------------|-----|-------|--------|------|-------|----------|----------|
| Attitude towards English Language Learning | 223 | 96.79 | 96     | 96   | 13.38 | -0.246   | 0.293    |

towards English Language Learning of secondary school students is 96.785, which is greater than the neutral value of Attitude towards English Language Learning. Thus, it can be concluded that the Attitude towards English Language Learning of secondary school students is at an average level.

A one-sample t-test was carried out to verify the significance of the difference between the obtained value ( $M=96.79$ ) for the scores on Attitude towards English Language Learning of secondary school students and the test value of Attitude towards English Language Learning ( $M=78$ ). The data and results of the one-sample t-test are given in Table 2.

Table 2 depicts that the critical ratio obtained for Attitude towards English Language Learning is 20.95, which indicates that the obtained mean value ( $M=96.79$ ) for the scores on Attitude towards English Language Learning of secondary

school students are higher than the test value, 78. Hence, Attitude towards English Language Learning ( $M=96.785$ ,  $SD=13.38$ ) of secondary school students is average. Thus, it can be concluded that the secondary school students have an average level of Attitude towards English Language Learning.

**Mean Difference Analysis of Score of the Attitude towards English Language Learning of Male and Female Students of Secondary Schools**

The data and results of the test of significant difference between the mean scores of Attitudes towards English Language Learning of male and female students of secondary schools are presented in Table 3.

Table 3 reveals that the critical ratio obtained for Attitude towards English Language Learning of secondary school students for the

**Table 2**  
**Data and Results of One-Sample t-Test**

| Variable                                   | N   | Mean  | Median | Mode  | SD    | Skewness | Kurtosis |
|--------------------------------------------|-----|-------|--------|-------|-------|----------|----------|
| Attitude towards English Language Learning | 223 | 96.79 | 96     | 13.38 | 20.95 | 0.01     | 0.293    |

**Table 3**  
**Data and Results of the Test of Significant Difference between Mean Scores of Male and Female Students of Secondary Schools**

| Category                                   | Gender | N   | Mean   | SD    | t-Value | Level of Significance |
|--------------------------------------------|--------|-----|--------|-------|---------|-----------------------|
| Attitude towards English Language Learning | Male   | 100 | 92.35  | 13.17 | 4.64    | 0.01                  |
|                                            | Female | 123 | 100.39 | 12.49 |         |                       |

sub-group based on gender is 4.64, which is greater than the tabled value of  $t$  ( $t=2.58$ ) required for significance at the 0.01 level. It also shows that the mean score and standard deviation of Attitude towards English Language Learning for male students are 92.35 and 13.17, respectively. The mean score and standard deviation of Attitude towards English Language Learning for female students are 100.39 and 12.49, respectively. As the  $t$ -value is greater than the tabled value of  $t$ , it can be concluded that there exists a significant difference in the mean scores of Attitude Towards English Language Learning of secondary school students for the subgroup based on gender.

### **Discussion on Objective 2**

The result of the  $t$ -test indicated that there exists a significant difference in the mean scores of Attitude towards English Language Learning of secondary school students for the sub-group based on gender. It can be concluded that the female students of the secondary schools have a higher level of Attitude towards English Language Learning than their male peers. Thus, the first hypothesis is rejected.

### **Mean Difference Analysis of Scores of Attitude towards English Language Learning of English Medium and Malayalam Medium Students of Secondary Schools**

The data and results of the test of significant difference between the mean scores of Attitudes towards English Language Learning of English medium and Malayalam medium students of secondary schools are presented in Table 4.

Table 4 reveals that the critical ratio obtained for Attitude towards English Language Learning of secondary school students for the subgroup based on medium of instruction is 7.94, which is greater than the tabled value of  $t$  ( $t=2.59$ ) required for significance at the 0.01 level. It also shows that the mean score and standard deviation of Attitude towards English Language Learning for Malayalam medium students are 88.92 and 11.80, respectively. The mean score and standard deviation of Attitude towards English Language Learning for English medium students are 101.81 and 11.85, respectively. As the  $t$ -value is greater than the tabled value of  $t$ , it can be concluded that there exists

**Table 4**

**Data and Results of the Test of Significant Difference between Mean Scores of English Medium and Malayalam Medium Students of Secondary Schools**

| Category                                   | Gender    | N   | Mean   | SD    | t-Value | Level of Significance |
|--------------------------------------------|-----------|-----|--------|-------|---------|-----------------------|
| Attitude towards English Language Learning | Malayalam | 87  | 88.92  | 11.80 | 7.94    | 0.01                  |
|                                            | English   | 136 | 101.81 | 11.85 |         |                       |

a significant difference in the mean scores of Attitude Towards English Language Learning of secondary school students for the subgroup based on medium of instruction.

### ***Discussion on Objective 3***

The result of the t-test indicated that there exists a significant difference in the mean scores of Attitude towards English Language Learning of secondary school students for the subgroup based on the medium of instruction. It can be concluded that the English medium students of the secondary schools have a higher level of Attitude Towards English Language Learning than the Malayalam medium students. Thus, the second hypothesis is rejected.

### **CONCLUSION**

The present study aimed to find the influence of gender and medium of instruction on Attitude towards English Language Learning of secondary school students in Kerala. The result of the study concluded that the secondary school students have an average level of Attitude towards English Language Learning, which should be enhanced to further their competence in the English language. An average level of Attitude towards English language learning indicates that the learners are neither completely enthusiastic about the language nor resistant towards learning English. Teachers need to cater to the betterment of the English language learners,

identifying the potential challenges in the process of English language learning.

The study also concluded that female students of secondary schools have a higher level of Attitude towards English Language Learning than their male counterparts. This calls for the use of equitable strategies in the form of teaching approaches which provide all the students with equal opportunities to participate, learn, and succeed, while also recognising and addressing the diverse needs and interests of the learners. By incorporating gamified tasks that include sports or adventure, meta-cognitive training, embodied cognition like pantomiming, and employing total physical response in English language classrooms to enhance motivation and participation among the male students. The study also demonstrated that English medium students of the secondary schools have a higher level of Attitude towards English Language Learning than the Malayalam medium students, which suggests that medium of instruction plays a quintessential role in forging the learners' attitude. Even so, learning in the first language can build strong cognitive foundations that lead to academic confidence among learners. Early instruction in the mother tongue can enhance comprehension and critical thinking, which supports more acquisition of the English language. So, integrating mother tongue with English exposure

can provide the most holistic benefit, ensuring strong foundational learning and also a positive attitude towards English, among the learners. Malayalam medium students can further enhance their attitude towards English language learning by providing them with greater exposure using interactive activities such as debates, group discussions and project-based tasks which connect the language with real-life situations. They can also enrich themselves by using digital tools and peer collaboration with the guidance of their teachers, making English learning more enjoyable and meaningful.

It is significant to address the average level of Attitude towards English language learning and to cater to the benefits of male students and Malayalam medium secondary school students. Incorporating more collaborative activities and group assignments can enhance a supportive language learning environment, where both male and female students are encouraged and motivated towards English language learning. Additionally, including more culturally relevant content in English classrooms can benefit the Malayalam medium secondary school students, thereby elevating their attitude towards English language learning. In this context, discourse-oriented pedagogy provides an innovative pathway, as it integrates mother tongue, gender, and social factors into meaningful communication practices that

cultivate positive attitudes towards English Language learning.

### **Educational implications**

- It would be beneficial to incorporate more interactive and contextually specific content into the English language teaching, in order to elevate students' engagement and interest.
- Implementation of classroom practices like peer collaboration, setting goals and tasks that simulate real-life application to enhance the intrinsic motivation towards learning English among the students.
- Designing English language learning activities that appeal to diverse learning styles and interests, along with ensuring that male students are equally given encouragement and support in English language acquisition.
- Including themes, topics, and genres that resonate with boys' interests, such as technology, sports, adventure, etc., into English resource materials and classroom discussions, to make it more relatable and engaging.
- Providing bridging programmes or scaffolding techniques for Malayalam medium students in order to ease their transition into an English learning environment would be beneficial.
- Teachers may adopt bilingual teaching strategies that would respect students' native language while also gradually building their

English proficiency, fostering inclusivity and confidence among the learners.

- Building self-esteem and confidence through positive feedback from the teachers can help learners to develop a higher Attitude towards English Language Learning. Connecting English learning with global opportunities and career pathways also enhances motivation and relevance among the learners. English language teachers can design lessons that foster enjoyment as well as curiosity, encouraging students to see English not just as a subject, but as a way for future growth as individuals.
- Discourse-oriented pedagogy can be utilised as an innovative classroom strategy that can encourage English language learners to engage in collaborative discussions, critical thinking, and shared meaning-making. Such practices will enable the cultivation of higher attitudes among the learners by promoting active participation and embracing diverse perspectives.

### **LIMITATIONS OF THE STUDY**

The present study, based on a sample of 223 learners, has limitations in several ways. The findings are

restricted to the specific group of English medium and Malayalam medium students as the sample, which may not represent the wider population of learners across diverse areas with various socio-economic backgrounds. The study has used self-reported attitudes of the learners, which can be affected by social desirability and may not include actual classroom behaviours or language performance of the learners.

### **FUTURE DIRECTIONS OF RESEARCH**

- Longitudinal studies can be undertaken to help understand how attitudes towards English Language Learning evolve with regard to age, exposure, and changing educational environments.
- Future research could include learners from diverse regions, socio-economic backgrounds, and different school types to see if the patterns of attitude differ beyond the Malayalam and English medium context.
- Studies could test the effect of innovative methods such as discourse-oriented pedagogy, gamification, or project-based learning on inculcating a positive Attitude towards English Language Learning among the learners.

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# Attitude of Stakeholders towards Inclusive Education for Children with Disabilities in Haryana State

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## Abstract

*Inclusive education for students with disabilities is mandated by the Right to Education Act, 2009 and the Rights of Persons with Disabilities Act, 2016. A positive attitude among stakeholders is essential for implementing inclusive education. This paper examines the attitude of various stakeholders towards inclusive education in Haryana. The sample of this study consisted of four types of stakeholders: 27 school heads, 81 classroom teachers, 26 parents, and 17 members of the School Management Committees, all randomly selected from 84 inclusive schools across four districts of the State. A descriptive survey method was employed, utilising a self-constructed 30-item attitude scale for data collection. The data were analysed using descriptive statistics. The results revealed an overall positive attitude of stakeholders towards inclusive education. The members of the School Management Committees exhibited the least favourable attitude compared to other stakeholder groups. Conversely, the parents expressed a more positive outlook than the other categories of stakeholders. Additionally, the findings indicated that female stakeholders had a more positive attitude than their male counterparts. The influence of educational qualifications and age on stakeholders' attitudes was also observed.*

**Keywords:** Attitude, Stakeholders, Inclusive Education for Children with Disabilities

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## INTRODUCTION

Inclusive education is a strategy aimed at educating students with disabilities along with their non-disabled peers in the least restrictive environment.

This approach has been globally recognised for several reasons. Avramidis *et al.* (n.d.), as cited in Thakur and Thakur (2012), argue

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that, “segregation of any form is morally incorrect.” Exclusion in any context can harm both individuals and society as a whole. Conversely, inclusive education welcomes all individuals, including those who may not fit societal expectations or who may feel out of place in the traditional educational settings. Inclusion benefits everyone (Bala, 2017) by fostering an environment in which all students can progress together.

Another significant reason to support inclusive education is its cost-effectiveness. Wang (2009) noted that inclusion not only serves as a financially efficient measure but also utilises resources effectively. Runswick-Cole (2008) highlighted that children in segregated settings often experience social regression, while those in inclusive environments tend to make progress. Furthermore, Wilson and Michael (2006) found that inclusion can enhance academic achievement for all students and promote acceptance of children with disabilities within the community. Research by Idol (2006) and Brigham *et al.* (2006) indicates that children included in mainstream classrooms exhibit academic improvements.

Socially, inclusion facilitates the development of healthy relationships, socio-emotional skills, early language and communication abilities, literacy skills, and appropriate behaviour, as emphasised by Henninger and Gupta (2014). From the perspective of Anisicow *et al.* (2006), the “human rights” viewpoint is more compelling

than any other argument advocating for meeting the needs of the children with disabilities in inclusive settings. International organisations such as UNESCO (2009), the World Bank (2014), and UNICEF (2015) emphasise that inclusive education benefits society overall, yielding positive returns on social, economic, and political levels.

The views of Indian educationists largely align with those of their Western counterparts. For instance, Jangira (1997) and Singal (2006) supported inclusion as a means to fulfil constitutional obligations regarding education for all, particularly in rural areas. Thakur and Thakur (2012) argued that segregation negatively impacts learners, teachers, and society. Bala (2017) noted that misconceptions about individuals with disabilities often prevail, with a tendency to view those who look physically different from others differently. Regular interaction between disabled and non-disabled individuals is encouraged to counter these myths.

In India, inclusive education was initiated in 2002 as part of the Sarva Shiksha Abhiyan (SSA) to promote the universalisation of elementary education. Later, in 2009, another initiative called Inclusive Education for the Disabled at Secondary Stage (IEDSS) was launched to educate students with disabilities who had completed elementary education and wished to pursue secondary education.

This initiative is also a crucial component of the Right to Education Act, 2009 and the Rights of Persons with Disabilities Act, 2016. Today, inclusive education is practised at the school level as an integral part of Samagra Shiksha.

Many researchers have explored people's feelings, views, and perceptions regarding individuals with disabilities, as well as their understanding of the concept of disability (WHO, 2011; McLennon, 2012). It is widely recognised that attitude plays a crucial role in determining the success or failure of persons with disabilities in various aspects of life. Ison *et al.* (2010) noted that the public's negative attitude toward individuals with disabilities often arises from ignorance and misconceptions.

A study conducted by Su *et al.* (2020) focused on stakeholders' attitudes toward inclusive education. Their findings revealed that the parents of children with disabilities exhibited the most positive attitudes, while classroom teachers showed the least positive attitudes. Further analysis indicated that the stakeholders' attitudes were influenced by their role position in the education field. When individuals are well-informed about individual differences, disabilities, and inclusive practices, they are more likely to develop a positive attitude toward diverse learners.

Cecelia (2014) found that many students in inclusive schools were

not educated about disabilities, which limited their understanding, acceptance, and empathy for peers with disabilities. Thornicroft *et al.* (2007) explored the impact of negative attitudes and behaviours on children and adults with disabilities and found that these negative perceptions harm the self-esteem of individuals with disabilities, ultimately reducing their participation in the community. Dalal (2006, as cited in Gowramma *et al.* 2018) reported that, "people with physical disabilities often suffer more due to societal prejudices than from the physical conditions they face." The NCERT (2008) survey revealed that the negative attitude towards children with disabilities was still prevalent in society.

Sharma and Deppeler (2005) concluded that negative attitude, poverty, ignorance, and a lack of adequate educational and infrastructural resources pose significant challenges to integrated education in India. In a study by Glazzard (2011), teachers at an inclusive primary school, demonstrated a negative attitude toward students with disabilities. These negative perceptions contributed to strong opposition from parents regarding inclusion, as many viewed it as a problematic practice.

Ross-Hill (2009) found that teachers had a positive attitude towards inclusive education. They also expressed confidence in their ability to teach students with disabilities

in inclusive settings, as they felt inadequately trained to meet those needs. Researchers have discovered that pre-service teachers in India are rarely exposed to inclusive education practices during their training. As a result, they have very limited knowledge of inclusive education (Sharma and Jacob, 2016). This lack of exposure and understanding can lead to a negative attitude toward students with disabilities, which ultimately undermines the principles of inclusive education.

In a study on the attitude of parents regarding the inclusion of children with Down Syndrome in regular schools in Australia, Campbell *et al.* (2003) found that while parents recognised the overall benefits of the inclusive education for both students with disabilities and their non-disabled peers, they further believed that the needs of children with disabilities were better met in special schools.

An NCERT (2020) study on the inclusiveness of schools reveals that inclusive education in India is far from reality. The stakeholders still hold a biased, discriminatory, and stereotypical attitude towards students with disabilities. Many teachers feel incapable and lack confidence when it comes to meeting the needs of these students, often relying on special education teachers for support. Additionally, stakeholders believe that special schools are more suitable for teaching students with disabilities, and many consider inclusion to

be an inadequate setting for their education. The study also indicates that School Management Committees (SMCs) need to take a more active role in the planning and management of inclusive education.

The result of Lemoine *et al.* (2024) study revealed that the enrollment of students with disabilities in inclusive schools of France has doubled during the last 15 years; however, this pattern is not similar everywhere but varies according to the type of disability, educational stage, and teachers' attitudes. In general, in and pre-service teachers held similar attitudes towards students with disabilities, but the attitude of pre-service teachers were more favourable than that of in-service teachers. Zanolini and Viterbori (2022) believe that inclusivity in educational settings promotes overall student well-being. Lindner *et al.* (2023) identify teachers' attitudes as a critical factor in the effective implementation of inclusive education. A lack of positive attitudes toward inclusion is frequently cited as a barrier to its successful execution. Avramidis *et al.* (2019) found that teacher age significantly influences attitudes toward inclusive education, with teachers aged 50 years or older demonstrating more positive attitudes than their younger counterparts. Aggarwal (2024) emphasises the necessity of fostering positive attitudes toward children with disabilities both in the classroom and in broader contexts. Prisiazhniuk *et al.* (2024) regard teachers as key agents in the implementation of inclusive education.

However, negative attitudes of the teachers continue to impede the smooth implementation of inclusive education in many central asian countries.

### **NEED AND JUSTIFICATION FOR THE STUDY**

Inclusive education is a relatively new initiative in India, aimed at providing education to children with disabilities in mainstream neighbourhood schools, supported by various services. The key stakeholders in this process include school heads, teachers, parents, and members of school management committees. It is well-established that no policy or programme can succeed without the support of the individuals involved in its execution. Stakeholders engaged in any programme invest their efforts based on their beliefs and opinions about it. Successful inclusion, in particular, relies on the positive and accepting attitudes of headteachers, teachers, parents, and SMC members towards children with disabilities.

According to Rejecki (1982), attitudes encompass desires, beliefs, feelings, views, opinions, hopes, judgments, and sentiments. This study is crucial because there is a prevailing belief that human behaviour and decisions are shaped by attitudes. The beliefs and attitudes of teachers profoundly affect their classroom teaching and management strategies, which in turn impact students' learning outcomes. A teacher's beliefs about the learning capabilities of students

with disabilities indicate how willing they are to modify teaching methods, the curriculum, and organise the classroom, or even recognise the presence of special educational needs within their class. Similarly, the attitudes of headteachers influence how the philosophy of inclusive education is implemented within the school system. Students with disabilities require special education services, such as aids, accessible classrooms, laboratories, and restrooms, to achieve success. It is the responsibility of the school head to provide these essential facilities, making their positive attitude a prerequisite for successful inclusion. The attitudes of parents and SMC members towards inclusion are also critical, as they play a significant role in this process. Negative attitudes from parents and SMC members can lead to the social marginalisation, teasing, and discrimination of students with disabilities within or outside the school system. Conversely, if these stakeholders hold positive views about inclusive education, they are more likely to support children with disabilities in their homework, social interactions, and efforts to create an accessible school campus.

In light of this, it is vital to examine the attitude of various stakeholders within the educational system of Haryana to gain a comprehensive understanding of their perspectives on inclusive education. Such an examination can lead to recommendations for effective changes in stakeholders' attitudes,

ultimately making inclusive education a successful practice.

## **OPERATIONAL DEFINITIONS OF KEY TERMS**

- **Attitudes:** In this study, Attitudes are the feelings, beliefs, and opinions of school heads, teachers, parents, and School Management Committee (SMC) members toward inclusive education.
- **Stakeholders:** In this study, stakeholders are school heads, teachers, parents, and members of the School Management Committees (SMC), connected with the implementation of inclusive education in Haryana.
- **Inclusive Education for Children with Disabilities:** In this study, inclusive education for children with disabilities refers to an educational practice wherein students with and without disabilities learning together, supported by the special teachers, aids, and accessible facilities.

## **OBJECTIVE**

The study aimed to explore the attitude of school heads, teachers, parents, and members of the school management committees regarding the inclusive education of students with disabilities in Haryana.

## **RESEARCH QUESTIONS**

The following research questions, in particular, guided this study:

- What are the attitudes of school heads, teachers, parents, and

School Management Committee (SMC) members towards inclusive education?

- How do the gender, age, and educational level of stakeholders influence their attitudes toward inclusive education?

## **METHODOLOGY**

### **Sample**

A random sample was drawn using a multistage sampling technique, which involved selecting one district each—Hissar, Faridabad, Jind, and Rohtak—representing the four administrative divisions of Haryana State, which comprises 22 districts. A comprehensive list of all schools within these districts was obtained from the District Education Officer (DEO) and the District Programme Coordinator (DPC). From this list, 21 schools were randomly selected from each district for an in-depth study. The chosen schools were then categorised into educational blocks and divided into two main groups—urban and rural. In total, 84 schools were selected, and a sample consisting of 27 school heads, 81 teachers, 26 parents, and 17 members of the SMC(s) was randomly drawn to assess their attitudes toward inclusive education. Only those participants from 84 schools who were fully willing to take part in the study were included as representatives of the population.

The assessment of stakeholder attitudes was one of the objectives of

the major research project assigned to the first author by the University Grants Commission (UGC), New Delhi. This project among other things, includes an evaluation of accessibility parameters for children with disabilities in 84 schools. Accessibility parameters were examined in all 84 schools, while stakeholder attitudes were measured only in those schools where stakeholders were willing to respond and participate in the study.

### **Ethical Considerations**

Ethical procedures were strictly followed in this study. The researchers obtained written consent from all participants and relevant authorities before commencing the research. Participants were fully informed about the purpose of the study, and their participation was entirely voluntary. Confidentiality and anonymity were maintained throughout the research process.

### **Tools for Data Collection**

A 30-item attitude scale was developed to investigate the attitudes of stakeholders. Some items were adapted from Khan's (2011) "Scale for Attitude towards the Disabled" and Moline's (n.d.) "Attitude toward Disabled Persons Scale." These adapted items were combined with self-constructed items to make them suitable for the study. In developing the items, suggestions from Edward (1968) and Best and Kahn (2006) were taken into account. Consequently, the items on the attitude scale were framed not as statements of fact but

as expressions of desired behaviour. The items were kept concise, using straightforward vocabulary and avoiding words like "only," "just," and "merely." Additionally, the items referenced the present, avoided double-barreled statements and double negatives, and did not include universal terms such as "all," "always," "none," and "never." The constructed attitude scale was then reviewed by language and subject experts for content validity and clarity. The feedback received from these experts was used to modify the items. Each item offered five response options—strongly agree, agree, undecided, disagree, and strongly disagree. Participants' scores ranged from 0 to 150. Three levels of attitude were identified—a negative attitude (score of 50 or less), a neutral attitude (score of 100 or less), and a positive attitude (score above 100). A higher score on the scale indicates a more positive attitude. The study was conducted from 2018 to 2020. The attitude scale was developed in English, then translated into Hindi and communicated orally in the local dialect, when needed. For illiterate respondents or those unable to fill it properly, the investigator himself or, in some cases, special teachers recorded their responses. The services of special teachers were arranged in sample districts through written approval from the State authorities at Panhkhula. The data collected through the attitude scale were analysed using descriptive statistics.

# RESULTS AND FINDINGS

In order to examine the attitude of 151 stakeholders towards inclusive education, the researcher(s) prepared a demographic profile of the stakeholders based on their roles, gender, age, and educational level. The details of this demographic profile are presented in Table 1.

Table 1 indicates that a total of 151 stakeholders responded to the attitude scale. Among them, 17 (11.26%) were School Management Committee (SMC) members, 81 (53.64%) were teachers,

27 (17.88%) were head teachers, and 26 (17.22%) were parents. In terms of gender, 96 (63.58%) of the stakeholders were male, while 55 (36.42%) were female.

The age range of teachers and head teachers was from 18 to 58 years, whereas the ages of parents and SMC members were even above 58 years. Nine stakeholders (5.96%) were aged between 18 and 30 years, while 97 stakeholders (64.24%) belonged to the 31 to 45 age group. A moderate number of stakeholders ( $n=44$ , 29.14%) were aged between 46 and 58 years, and only one

**Table 1**  
**Demographic Profile of Stakeholders**

| S. No. | Stakeholders                             | Number | Percentage |
|--------|------------------------------------------|--------|------------|
| 1.     | <b>Role Position</b>                     |        |            |
|        | School Management Committee (SMC) Member | 17     | 11.26      |
|        | Teacher                                  | 81     | 53.64      |
|        | Head Teacher                             | 27     | 17.88      |
|        | Parents                                  | 26     | 17.22      |
|        | Total                                    | 151    | 100        |
| 2.     | <b>Gender</b>                            |        |            |
|        | Male                                     | 96     | 63.58      |
|        | Female                                   | 55     | 36.42      |
| 3.     | <b>Age</b>                               |        |            |
|        | 18–30 Years                              | 9      | 05.96      |
|        | 31–45 Years                              | 97     | 64.24      |
|        | 46–58 Years                              | 44     | 29.14      |
|        | 58–Above                                 | 1      | 0.66       |
| 4.     | <b>Level of Education</b>                |        |            |
|        | Illiterate                               | 1      | 0.66       |
|        | Primary                                  | 10     | 6.62       |
|        | Matric                                   | 14     | 9.27       |
|        | 10+2                                     | 16     | 10.59      |
|        | Graduation                               | 26     | 17.22      |
|        | Post-graduation and above                | 84     | 55.63      |

participant (0.66%) was above the age of 58 years.

The educational levels of the participants varied from illiteracy to post-graduation. Only one participant (0.66%) was illiterate, while 10 (6.62%) had completed primary education, 14 (9.27%) had passed their matriculation, 16 (10.59%) had completed 10+2, 26 (17.22%) were graduates, and 84 (55.63%) had post-graduate or higher qualifications.

### Teachers' Attitudes towards Inclusive Education

Table 2 shows the mean attitude scores of teachers towards Inclusive Education.

Table 2 illustrates that the group of teachers exhibited a 'positive' attitude towards inclusive education, with a mean score of 110.10 ( $n=81$ ) on the attitude scale. Among these teachers, females ( $n=29$ , mean=111.45)

demonstrated a slightly more positive attitude than their male counterparts ( $n=52$ , mean=109.35). The age of the teachers, ranged from 18 to 58 years. Younger teachers (aged 18–30 years) had a higher mean score ( $n=8$ , mean=126.62) as compared to those who were aged 46 to 58 years ( $n=19$ , mean=109.10). Notably, the group of teachers aged 30 to 45 recorded the lowest mean score ( $n=54$ , mean=108). Additionally, teachers with an educational background upto 10+2 had the lowest mean score among all sub-categories ( $n=2$ , mean=107.50).

The positive attitudes and feelings of teachers reflect a new trend in inclusive education. The findings show that teachers are becoming more knowledgeable and aware of the principles of inclusive education. They are willing to adapt their teaching methods, materials, curriculum, and classroom furniture to meet the needs of children with disabilities.

**Table 2**  
**Mean Scores of Teachers on the 'Attitude towards Inclusive Education' Scale**

| S. No. | Stakeholders              | Number | Percentage | Mean Score |
|--------|---------------------------|--------|------------|------------|
| 1.     | <b>Role Position</b>      |        |            |            |
|        | Teacher                   | 81     | 53.64      | 110.10     |
| 2.     | <b>Gender</b>             |        |            |            |
|        | Male                      | 52     | 64.19      | 109.35     |
|        | Female                    | 29     | 35.81      | 111.45     |
| 3.     | <b>Age</b>                |        |            |            |
|        | 18–30 Years               | 8      | 9.88       | 126.62     |
|        | 31–45 Years               | 54     | 66.67      | 108.00     |
| 4.     | <b>Level of Education</b> |        |            |            |
|        | 10+2                      | 2      | 2.47       | 107.50     |
|        | Graduation                | 19     | 23.46      | 108.68     |
|        | Post-graduation and above | 60     | 74.06      | 110.63     |

Teachers appear to be more hopeful about the individuals with disabilities, recognising their abilities and limitations, and are willing to accommodate them accordingly.

Furthermore, the positive attitude of teachers indicates that children with disabilities are viewed not as burdens on the school system, but as an integral part of it. If this trend of positive attitudes among teachers continues, it could lead to increased enrollment and improved retention of students with disabilities within the inclusive education system. This shift indicates the success of ongoing efforts by policymakers and educators to raise awareness among teachers about inclusive education by highlighting the unique strengths and needs of children with disabilities in professional development programmes or in-service trainings. Younger teachers tend to have a more positive attitude towards inclusive education than their older colleagues. This difference suggests that including a course on special and inclusive education in pre-service teacher programmes—something that wasn't offered three or four decades ago—has made a significant impact on the perceptions and opinions of teachers about inclusive education, which among other things, helps in the success of this policy as young teachers would be more collaborative with special teachers and paramedical staff in facilitating inclusive practices. The effect of higher education on

attitudes is evident, as individuals with lower education levels tend to have less positive attitudes compared to those with higher education. This indicates that teachers may be encouraged to continually improve their qualifications, as it affects their attitudes, which, in turn, influences the implementation of inclusive education.

### **Head Teachers' Attitude towards Inclusive Education**

Table 3 shows the mean attitude scores of head teachers towards inclusive education.

Table 3 indicates that a total of 27 head teachers participated in the survey, and they demonstrated a 'positive' attitude towards the implementation of inclusive education. Among the participants, the majority were male ( $n=17$ , 62.96%), while there were fewer females ( $n=10$ , 37.04%). The average score of male head teachers ( $n=17$ ,  $m=109.59$ ) was higher than that of their female counterparts ( $n=10$ ,  $m=107.40$ ). The older head teachers ( $n=17$ ,  $m=107.29$ ) had a lower mean score than their less experienced colleagues ( $n=17$ ,  $m=111.30$ ). A significant majority of head teachers ( $n=24$ , 88.89%) held qualifications equivalent to a post-graduate degree or higher, while only a few of them were graduates ( $n=2$ , 7.40%). Interestingly, the more highly qualified heads had a lower mean score than those with lower

**Table 3**  
**Mean Scores of Head Teachers on the ‘Attitude towards Inclusive Education’ Scale**

| S. No. | Stakeholders              | Number | Percentage | Mean Score |
|--------|---------------------------|--------|------------|------------|
| 1.     | <b>Role Position</b>      |        |            |            |
|        | Head Teacher              | 27     | 17.88      | 108.78     |
| 2.     | <b>Gender</b>             |        |            |            |
|        | Male                      | 17     | 62.96      | 109.59     |
|        | Female                    | 10     | 37.04      | 107.40     |
| 3.     | <b>Age</b>                |        |            |            |
|        | 18–30 Years               | 0      | 0          | 0          |
|        | 31–45 Years               | 10     | 37.04      | 111.30     |
|        | 46–58 Years               | 17     | 62.96      | 107.29     |
| 4.     | <b>Level of Education</b> |        |            |            |
|        | 10+2                      | 1      | 03.70      | 101        |
|        | Graduation                | 2      | 07.40      | 127.50     |
|        | Post-graduation and above | 24     | 88.89      | 107.54     |

educational qualifications, suggesting that they may be less positive about inclusive education.

The positive sentiments expressed by school heads imply that they will be more cooperative when relieving a teacher for in-service training on inclusive education. Furthermore, they will collaborate more effectively with outside agencies to mobilise and pool resources for inclusion. They are also likely to monitor accessibility parameters for children with disabilities while planning or overseeing civil work in the school. The impact of gender, age, and educational qualifications on attitudes towards inclusive education is also evident, and it should be considered by policymakers and educators while designing and implementing a training programme on inclusive education for head teachers.

**SMC Members’ Attitude towards Inclusive Education**

Table 4 highlights the mean attitude scores of SMC members towards Inclusive Education.

Table 4 reveals that the overall attitude of 17 members of SMCs was borderline positive. This group of School Management Committees (SMCs) consisted of 9 females (52.94%) and 8 males (47.06%). Males ( $n=8$ ,  $m=100.50$ ) revealed a slightly more positive attitude than females ( $n=9$ ,  $m=100$ ). The age of the members ranged from 18 to 58 years and above, with the middle-aged members displaying a relatively more positive attitude as compared to the older and younger members. Interestingly, education levels did not indicate a significant positive impact on their attitude towards inclusive education. The findings further reveal

**Table 4**  
**Mean Scores of SMC Members on the 'Attitude towards Inclusive Education' Scale**

| S. No. | Stakeholders              | Number | Percentage | Mean Score |
|--------|---------------------------|--------|------------|------------|
| 1.     | <b>Role Position</b>      |        |            |            |
|        | SMC Member                | 17     | 11.26      | 100.24     |
| 2.     | <b>Gender</b>             |        |            |            |
|        | Male                      | 8      | 47.06      | 100.50     |
|        | Female                    | 9      | 52.94      | 100        |
| 3.     | <b>Age</b>                |        |            |            |
|        | 18–30 Years               | 0      | 0          | 0          |
|        | 31–45 Years               | 15     | 88.24      | 100.33     |
|        | 46–58 Years               | 1      | 5.88       | 102        |
|        | Above 58 Years            | 1      | 5.88       | 100        |
| 4.     | <b>Level of Education</b> |        |            |            |
|        | Illiterate                | 0      | 0          | 0          |
|        | Primary                   | 7      | 41.18      | 100.14     |
|        | Matric                    | 4      | 23.53      | 104.5      |
|        | 10+2                      | 5      | 29.41      | 98.60      |
|        | Graduation                | 1      | 5.88       | 92         |
|        | Post-graduation and above | 0      | 0          | 0          |

that respondents with secondary level school education ( $n=5$ ,  $m=98.60$ ) had a 'neutral' attitude similar to the graduates ( $n=1$ ,  $m=92$ ), while those with primary education ( $n=7$ ,  $m=100.14$ ) and those who passed matric ( $n=4$ ,  $m=104.5$ ) exhibited a 'positive' attitude. Notably, the sole graduate had a lower mean score than both the secondary and matriculate respondents. Additionally, none of the SMC members held a post-graduate degree.

The School Management Committees (SMCs) play a vital role in raising community awareness to facilitate the admission of children with disabilities into local schools. They assist local Anganwadi workers and officials from primary health

centres in the preliminary screening of students with disabilities. SMCs are also responsible for contributing to school infrastructure development plans. When SMC members hold positive views about inclusive education for children with disabilities, the school infrastructure is more likely to be accessible and supportive for all students. This positive attitude helps to ensure compliance with the zero-rejection policy during admissions. Furthermore, the supportive perspective of SMC members positively influences the social acceptance of children with disabilities. The influence of gender, age, and educational levels has implications for policymakers and educators when designing and

executing training programmes for SMC members on inclusive education.

### Parents' Attitude towards Inclusive Education

Table 5 provides the mean attitude scores of parents towards Inclusive Education.

Table 5 reveals the overall mean attitude score of 26 parents as well as their respective mean scores in three sub-categories. In aggregate, parents were found to hold a 'positive' attitude towards inclusive education, and between them, mothers ( $n=7$ ,  $m=109.86$ ) had a more positive attitude than fathers ( $n=19$ ,  $m=103.37$ ). Parents in the age group of 45 to 58 years showed a more

positive outlook as compared to other age groups. Strangely, parents possessing a graduate degree and those with only primary education had a more positive attitude than the rest of the members of their group.

The overall positive attitude of parents has a significant impact on the education of children with disabilities. Parents who maintain a positive outlook are more likely to send their children to school rather than keep them at home due to social stigma or fear. This positivity about inclusion highlights the importance of education in their mindsets, even though many parents of children with disabilities are daily wage earners and may be illiterate or have

**Table 5**  
**Mean Scores of Parents on the 'Attitude towards Inclusive Education' Scale**

| S. No. | Stakeholders              | Number | Percentage | Mean Score |
|--------|---------------------------|--------|------------|------------|
| 1.     | <b>Role Position</b>      |        |            |            |
|        | Parents                   | 26     | 17.22      | 105.11     |
| 2.     | <b>Gender</b>             |        |            |            |
|        | Male                      | 19     | 73.08      | 103.37     |
|        | Female                    | 7      | 26.92      | 109.86     |
| 3.     | <b>Age</b>                |        |            |            |
|        | 18–30 Years               | 1      | 3.85       | 107.00     |
|        | 31–45 Years               | 18     | 69.23      | 103.22     |
|        | 46–58 Years               | 7      | 26.92      | 109.72     |
|        | Above 58 Years            | 0      | 0          | 0          |
| 4.     | <b>Level of Education</b> |        |            |            |
|        | Illiterate                | 1      | 3.85       | 101.00     |
|        | Primary                   | 3      | 11.54      | 107.66     |
|        | Matric                    | 10     | 38.46      | 105.60     |
|        | 10+2                      | 08     | 30.77      | 102.87     |
|        | Graduation                | 4      | 15.38      | 107.50     |
|        | Post-graduation and above | 0      | 0          | 0          |

lower educational qualifications. The results indicate that educated, willing, and optimistic parents are more likely to assist their children in completing homework and seeking better career opportunities after finishing school.

### Category-wise Attitude of Stakeholders towards Inclusive Education

Table 6 presents the mean attitude scores of 151 respondents towards inclusive education with particular reference to their role in the school

system. The mean attitude score of all groups ranges from 100.24 to 110.10, indicating that the stakeholders possessed a 'positive' attitude towards inclusive education. Although differences in mean attitude scores were found between different groups of stakeholders, the size of the mean differences was small, suggesting little practical significance.

While comparing specific groups, teachers ( $n=81$ ,  $m=110.10$ ) exhibited the most favourable attitude towards inclusive education, followed by parents ( $n=26$ ,  $m=105.11$ ),

**Table 6**  
**Mean Attitude Scores of 151 Stakeholders towards Inclusive Education**

| S. No. | Stakeholders              | Number | Percentage | Mean Score |
|--------|---------------------------|--------|------------|------------|
| 1.     | <b>Role Position</b>      |        |            |            |
|        | SMC Members               | 17     | 11.26      | 100.24     |
|        | Teacher                   | 81     | 53.64      | 110.10     |
|        | Head Teacher              | 27     | 17.88      | 108.78     |
|        | Parents                   | 26     | 17.22      | 105.11     |
|        | Overall                   | 151    | 100        | 107.89     |
| 2.     | <b>Gender</b>             |        |            |            |
|        | Male                      | 96     | 63.58      | 107.47     |
|        | Female                    | 55     | 36.42      | 108.63     |
| 3.     | <b>Age</b>                |        |            |            |
|        | 18–30 Years               | 09     | 5.96       | 124.44     |
|        | 31–45 Years               | 97     | 64.24      | 106.24     |
|        | 46–58 Years               | 44     | 29.14      | 108.34     |
|        | Above 58 Years            | 01     | 0.66       | 100.00     |
| 4.     | <b>Level of Education</b> |        |            |            |
|        | Illiterate                | 01     | 0.66       | 101.00     |
|        | Primary                   | 10     | 6.62       | 102.40     |
|        | Matric                    | 14     | 9.27       | 105.28     |
|        | 10+2                      | 16     | 10.59      | 102.00     |
|        | Graduation                | 26     | 17.22      | 109.31     |
|        | Post-graduation and above | 84     | 55.63      | 109.75     |

head teachers ( $n=27$ ,  $m=108.78$ ), and SMC members ( $n=17$ ,  $m=100.24$ ).

In terms of gender, female stakeholders ( $n=55$ ,  $m=108.63$ ) demonstrated a more positive attitude towards inclusive education than their male counterparts ( $n=96$ ,  $m=107.47$ ). This may be attributed to women generally being more caring and emotionally attached to their children's education. Additionally, females, as mothers and nurturing figures, are more likely to attend SMC, Parents and Teachers Association (PTA) meetings, and also participate in training during annual counselling and awareness camps.

Most stakeholders were middle-aged, and collectively, they exhibited higher mean scores that reflected a greater acceptance of inclusive education. Interestingly, stakeholders in the 18–30 age range ( $n=9$ ,  $m=124.44$ ) displayed the highest level of 'positive' attitude towards the inclusive education as compared to all other age groups, indicating a promising future for inclusive education. While the majority of stakeholders had post-graduate qualifications, a small number of them possessed undergraduate degrees, and even fewer among them had education up to 10+2 only. There were 14 stakeholders, having education upto matriculation level and 10 with a primary education; only one stakeholder was illiterate. The mean attitude scores within the educational groups were: illiterates ( $m=101$ ), stakeholders with a primary

level of education ( $m=102.40$ ), matriculates ( $m=105.28$ ), 10+2 ( $m=102$ ), graduates ( $m=109.31$ ), and post-graduates and above (109.75). This reveals that stakeholders with post-graduate and graduate degrees had a highly positive attitude towards inclusive education, while other groups were lagging behind them. Therefore, the results suggest a positive relationship between stakeholders' educational qualifications and their attitudes towards inclusive education. The findings further suggest that educational qualifications influence stakeholders' attitudes.

## DISCUSSION

Although stakeholders collectively had a positive attitude towards the inclusive education, the mean attitude scores varied depending on their roles within the school system as well as according to their age, gender, and educational levels. These findings address both the research questions. These findings are in agreement with Su, Guo, and Wang (2020) but contradict earlier research by Cohen (1994), Evans *et al.* (1998), Sharma and Deppeler (2005), NCERT (2008), and Glazzard (2011), which indicated that people had negative attitudes toward inclusive education. Additionally, the current results challenge Bala's (2017) assertion that parents, family members, and the community believe there is no benefit in educating children with disabilities. This study aligns

with Khan's (2011) findings that teachers predominantly have positive attitudes toward inclusive education. This finding has implications for training stakeholders, because training programmes on various aspects of inclusive education can be designed considering the different roles of stakeholders in the overall inclusion process.

The members of the School Management Committee (SMC) are falling behind other stakeholder groups in developing a positive attitude towards inclusive education. This finding has significant implications for inclusive education, as SMC members play a crucial role in this process. They are responsible for identifying and enrolling children with disabilities from their local communities and for ensuring that the necessary instructional and infrastructural facilities are available in schools. Furthermore, members of SMCs are instrumental in the development of annual plans, mobilising local resources, monitoring expenditures and conducting social audits. To foster a more proactive and supportive attitude among SMC members, it is essential to design and execute comprehensive awareness programmes for them. Engaging media to disseminate knowledge about inclusion and sharing success stories of persons with disabilities with SMC members can also play a pivotal role in reshaping their attitudes.

Teachers' positive attitude towards inclusion reflects their knowledge

and skills in educating children with disabilities in inclusive classrooms. However, the relatively lower attitude scores among junior basic teachers/primary teachers (who had their educational level up to 10+2 only) are a matter of concern, as primary teachers are the first with whom children with disabilities come into contact after their enrollment. The National Education Policy (NEP) 2020 places obligations on these teachers to engage these students in speech, art, and sensory therapy, besides facilitating foundational literacy and numeracy during early childhood education. To effectively implement the positive changes envisioned by the NEP 2020, it is imperative to develop and execute strategies which have a bearing on the attitudes of JBT teachers.

Head teachers ranked second in terms of fostering a positive attitude towards inclusive education. Administrative support is crucial for the success of any programme or policy. A head teacher with a positive attitude can facilitate teachers' participation in in-service training, take up initiatives for SMC members and parents, collaborate with other agencies to receive aids and appliances for children with disabilities, submit funding proposals, enhance infrastructure, and ensure better attendance of students with disabilities, along with providing necessary medical and instructional support. Therefore, it is desirable to maintain and upgrade

their awareness about inclusive education through professional development programmes so that their attitude remains always positive towards inclusive education.

Parents also exhibit a positive attitude toward inclusive education, reflecting the progressive nature of parenting in Haryana. Parents are considered the first teachers of a child and are primary stakeholders in their children's education. Parents of children with disabilities have a vital role in inclusive education, and the efforts of teachers may be undermined if parents do not support their children at home. Despite facing numerous challenges, many parents, often from disadvantaged backgrounds, demonstrate motivation and positivity. Their positive attitude may stem from annual training on inclusive education, highlighting the transformative changes occurring in Haryana. The positive attitude of parents has a significant impact on the implementation of inclusive education because, as a part of SMC, they can influence the annual budget, make recommendations for building accessibility, and ensure that special teachers are appointed at each school. Additionally, parents can participate in social campaigns or collaborations with government agencies that enhance the implementation of inclusive education.

The findings of this study have implications for the media, policymakers, rehabilitation professionals, and schools. The

media should highlight the abilities and achievements of persons with disabilities to create a positive image in the public mindset. Policymakers may allocate more funds to provide quality education to students with disabilities by building on positive attitudes. Rehabilitation professionals should instil positivity in schools and help bring out-of-school children with disabilities into mainstream education. The positive attitude of teachers and school administrators can help pool additional resources from the community.

The study's findings should be applied carefully, as it was delimited to stakeholders of children with seven distinct disabilities, ranging from blindness and low vision to mental illness and leprosy-cured. Drawing its sample from inclusive schools across Faridabad, Jind, Hissar, and Rohtak in Haryana, the research lays a foundation for the future exploration. Expanding the scope to include all 21 disabilities recognised in the RPwD Act 2016 could offer a richer understanding. There is also great potential in comparing students from diverse landscapes such as hills, plains, deserts, and forests. Further studies might delve into the impact of early interventions, mental health, academic progress, personal hygiene, and sex education, opening new avenues for meaningful change.

## CONCLUSION

It is well recognised that a child's maladjustment is often not due to

their disability itself, but rather due to the emotional stress imposed by societal perceptions and attitudes regarding their abilities or disabilities. For inclusive education to be successful, all stakeholders are required to have a positive attitude. The study highlights the need for continuous efforts to develop and upgrade the awareness of the stakeholders regarding inclusive education according to their role position, as well as to dispel any myths or misconceptions about disability, especially among those teachers who are on the verge of retirement and those who have not enhanced their educational qualifications after 10+2. By fostering a positive attitude in

them towards inclusion, we can better support students with disabilities. If the education system does not embrace students with disabilities positively, then, despite initiatives by the Government of India for all types of students in the mainstream school system, it cannot yield fruitful results for achieving the intended goals.

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# A Conceptual Framework for Integrating Innovative Formative Assessment Strategies Aligned with NEP 2020 Goals

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## Abstract

*Traditional assessment practices have long been criticised for their emphasis on rote memorisation, high-stake examinations, and limited formative feedback, thereby constraining students' holistic development. The National Education Policy (NEP) 2020 envisions a paradigm shift towards competency-based assessment that promotes higher-order thinking, conceptual understanding, and real-world application. This study delineates key criteria for innovative formative assessment, emphasising student-centred, technology-enabled, and competency-based evaluation models. Drawing on constructivist and experiential learning theories, the paper integrates theoretical perspectives with assessment practices, advocating formative approaches such as performance-based assessment, peer and self-assessment, and digital assessment tools to enhance learners' critical thinking and adaptability. The study proposes a conceptual framework synthesising existing literature on innovative formative assessment strategies in language and science education. Additionally, it examines the role of PARAKH in standardising and transforming India's assessment ecosystem by ensuring equitable and competency-driven evaluation practices. By incorporating global best practices and technology-enhanced assessment models, this framework underscores a transition towards holistic, adaptive learning environments that prepare learners for the demands of the twenty-first-century workforce.*

**Keywords:** National Education Policy (NEP) 2020, Innovative Formative Assessment, Language and Science Education, Twenty-first-century Skills

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## INTRODUCTION

The National Education Policy (NEP) 2020 explicitly calls for a transition from summative assessments centred on rote memorisation to continuous, formative, and competency-based evaluation systems that foster higher-order cognitive skills such as analysis, creativity, and critical thinking (Government of India, 2020, para. 4.34). Assessment plays a pivotal role in monitoring student learning and informing pedagogical decision-making (Singh and Kaur, 2023). As Pathak and Maity (2024, p. 1) aptly observe, “assessing a student’s performance is a two-way window,” offering insights into both instructional effectiveness and individual learning trajectories.

NEP 2020 advocates a holistic and multidimensional assessment framework that integrates learning with evaluation and promotes conceptual understanding over content reproduction. To support this transformation, the policy mandates the establishment of the National Assessment Centre—PARAKH—to set benchmarks, standardise assessment practices, and enhance educational quality across school boards (Sujatha, 2024). PARAKH is expected to shift assessment culture from traditional written examinations towards self-assessment, peer assessment, parental feedback, and competency-based evaluation (Borah, 2022), thereby ensuring equity and consistency across diverse educational contexts.

In this context, the formative assessment assumes critical importance, as it provides timely feedback, enables instructional adjustment, and supports continuous learning (Singh and Kaur, 2023). Innovative formative assessment strategies encourage learners to apply classroom knowledge to real-life contexts, moving beyond memorisation towards skill development and conceptual clarity. Subject-specific formative approaches in language and science education further enhance learner engagement by aligning assessment with disciplinary practices.

This paper proposes a conceptual framework synthesising global research on innovative formative assessment practices in language and science education, aligned with the goals of NEP 2020. Grounded in constructivist and experiential learning theories, the framework seeks to guide educators in implementing learner-centred, equitable, and technology-enhanced assessment practices that promote lifelong learning.

## CRITERIA FOR INNOVATIVE ASSESSMENT

Innovative assessment practices are characterised by their alignment with constructivist learning principles, active learner engagement, integration of assessment with instruction, and responsiveness to diverse learner needs. These approaches challenge traditional assessment paradigms by prioritising authenticity, inclusivity, and real-world

relevance over rote memorisation and high-stakes testing.

### **Student-centred and Constructivist Orientation**

Innovative assessments foreground active learner participation, enabling students to construct knowledge through authentic and meaningful tasks. Unlike conventional examinations constrained by time, standardisation, and limited support, these approaches promote inquiry, collaboration, and problem-solving (McDowell, 2002). Project-based learning and portfolio assessment exemplify this orientation by engaging learners in real-world problem-solving, reflection, and knowledge construction (Kokotsaki *et al.*, 2016; Mahayukti *et al.*, 2018).

### **Authenticity and Real-World Relevance**

Authentic assessment bridges the gap between academic learning and the professional practice by embedding real-world challenges within assessment tasks. Project-based assessment nurtures transferable skills, such as leadership, systems thinking, and critical reasoning, thereby enhancing learner employability (Nägele and Stalder, 2017; Holmes, 2012). Competency-based assessment further ensures that learners are able to apply conceptual understanding in practical and contextualised situations (Akhil Bhartiya Shiksha Samagam, 2023).

### **Continuous and Formative Feedback**

In contrast to summative examinations, innovative assessment prioritises continuous evaluation and timely feedback. Continuous and Comprehensive Evaluation (CCE) facilitates ongoing monitoring of learner progress and supports personalised instructional interventions (Rao and Panapana, 2020). Tools such as quizzes, exit tickets, self-assessment, and peer feedback provide immediate insights into learning gaps while informing instructional decision-making (Salas-Morera *et al.*, 2012; Patricia and Deborah, 2012).

### **Collaborative and Peer-led Learning**

Peer and self-assessment strategies foster collaborative learning, metacognitive awareness, and shared responsibility for learning. Peer assessment, when guided by transparent criteria and rubrics, enhances learner engagement and critical judgement (Carlos *et al.*, 2014). Pedagogical approaches such as Socratic seminars and team-based learning, further promote dialogue, collective reasoning, and cooperative problem-solving (Castellanos-Reyes, 2021; Burgess *et al.*, 2020).

### **Technology-enhanced and Scalable Assessment**

Digital technologies significantly enhance the efficiency, accuracy, and scalability of assessment practices. Learning Management Systems enable streamlined submission, grading, and feedback, while AI-enabled

tools support adaptive evaluation and personalised learning pathways (Gonzalez Calatayud *et al.*, 2021; Khatser and Khatser, 2022). Online quizzes, simulations, and e-portfolios offer multimodal opportunities for learners to demonstrate knowledge and skills (España-Delgado, 2023; Zhang and Tur, 2022).

### **Multidisciplinary and Holistic Evaluation**

Innovative assessment adopts interdisciplinary approaches that encourage learners to integrate the knowledge across domains. The interdisciplinary projects promote adaptability, systems thinking, and complex problem-solving abilities (Berasategi *et al.*, 2020; Kim and Tan, 2013). Portfolio assessment supports holistic evaluation by documenting learners' reflective practices, decision-making processes, and professional growth over time (Haldane, 2014).

### **Inclusive and Equitable Assessment Practices**

Equity is central to innovative assessment design. Flexible assessment options, co-created evaluation criteria, and inclusive task design ensure that learners from diverse linguistic, cultural, and ability backgrounds are able to demonstrate learning effectively (Tai *et al.*, 2021). Assessment for the social justice extends beyond procedural fairness to emphasise equitable learning outcomes and meaningful participation for all learners (Ajjawi *et al.*, 2022).

### **Assessment Strategies Grounded in Educational Theories**

Constructivist learning theory underpins student-centred assessment by emphasising active engagement, social interaction, and scaffolding (Piaget, 1954; Vygotsky, 1978). The concept of the Zone of Proximal Development highlights the role of guided learning through peer collaboration, formative feedback, and instructional support (Shepard, 2000). Scaffolding enables learners to gradually assume ownership of performance-based tasks (Bruner, 1966).

Formative assessment models emphasise feedback loops that inform instructional adjustments and foster learner self-regulation (Black and Wiliam, 1998), aligning closely with NEP 2020's competency-based vision. In language education, interactive assessment strategies such as role-play, simulations, and digital tools, support authentic language acquisition (Krashen, 1985; Jonassen, 1991). In science education, inquiry-based frameworks such as the 5E model and Claim–Evidence–Reasoning (CER) promote conceptual understanding and scientific reasoning (Bybee, 2006; McNeill and Krajcik, 2008).

Self-regulated learning theory and growth mindset perspectives further position formative assessment as a catalyst for motivation, reflection, and lifelong learning (Schunk, 2012; Dweck, 2006). Technological frameworks incorporating AI-driven analytics and adaptive testing enhance personalisation while maintaining

the fairness, transparency, and scalability in assessment systems (McKay, 2013; Jolibekova, 2024).

# INTEGRATING CONSTRUCTIVIST AND EXPERIENTIAL LEARNING THEORIES INTO INNOVATIVE FORMATIVE ASSESSMENT OF LANGUAGE EDUCATION

Constructivist learning theory emphasises that learners actively construct knowledge through meaningful interactions with language, supported by social dialogue, scaffolding, and reflection (Vygotsky, 1978; Bruner, 1996).

Complementing this perspective, experiential learning foregrounds learners' engagement with concrete, real-life tasks, encouraging cycles of reflection, conceptualisation, and the reapplication of linguistic knowledge (Kolb, 1984; Moon, 2004). Together, these theoretical foundations inform pedagogical strategies that foster learner engagement, deeper understanding, and authentic language use.

Instructional approaches, such as inquiry-based learning, collaborative group activities, and problem-solving tasks enable learners to negotiate meaning within social and

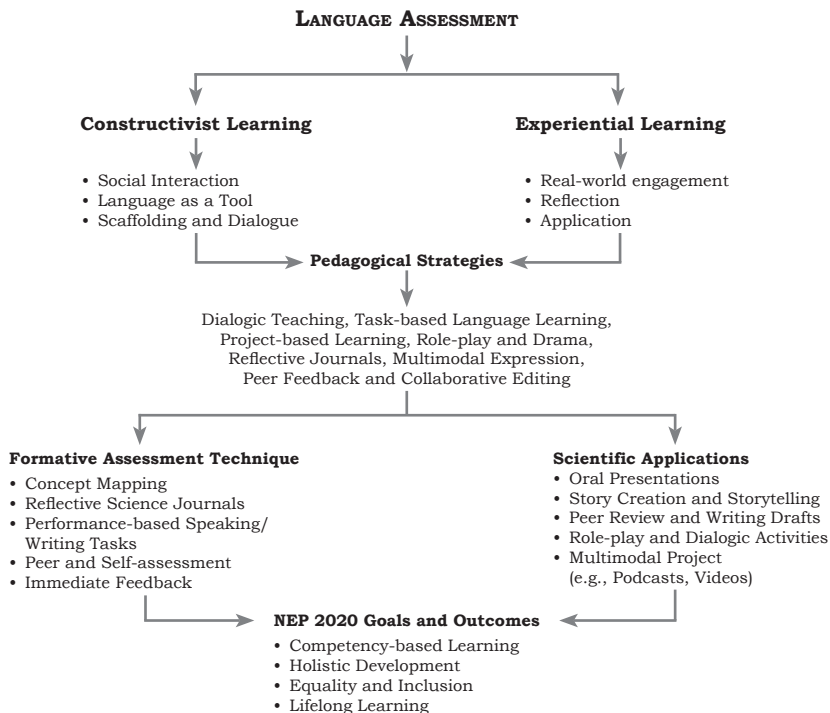


Fig. 1. A conceptual diagram depicting the constructivist and experiential approach to language learning and assessment

contextual frameworks (NCERT, 2023; Darling-Hammond *et al.*, 2017). Language learning thus becomes a participatory and exploratory process in which meaning is co-constructed rather than memorised (Nicol and Macfarlane-Dick, 2006). In alignment with this pedagogical orientation, innovative formative assessment strategies are seamlessly embedded within everyday classroom practices.

Formative assessment tools such as concept mapping support learners in visualising and connecting linguistic concepts (Gulikers *et al.*, 2004), while reflective journals enable students to document language use, challenges, and growth over time (Moon, 2004). Performance-based tasks, including contextualised speaking and writing activities, assess learners' ability to apply language meaningfully in authentic situations (Black and Wiliam, 1998). Peer and self-assessment, supported by immediate and descriptive feedback, further promote self-regulation, metacognitive awareness, and learner autonomy (Nicol *et al.*, 2006; Guskey, 2000).

These assessment practices directly inform classroom language applications. Learners engage in oral presentations, story creation and storytelling, peer-reviewed writing drafts, dialogic role-play, and multimodal communication projects (NCERT, 2023; Ministry of Education, 2020). Such authentic tasks mirror real-world communication demands and encourage purposeful, creative,

and confident language use (Gulikers *et al.*, 2004).

This integrated assessment model strongly supports the realisation of NEP 2020 goals by promoting competency-based learning, grounded in authentic language use rather than rote memorisation (Ministry of Education, 2020). It fosters holistic development across cognitive, social, and emotional domains (Fullan, 2007), while ensuring equity and inclusion through flexible and responsive assessment practices that accommodate diverse learner needs (UNESCO, 2015; PRATHAM, 2020). By encouraging reflection and learner autonomy, the framework further nurtures lifelong learning skills, preparing students to engage with the language critically and confidently beyond the classroom (Nicol and Macfarlane-Dick, 2006; Moon, 2004).

### **INTEGRATING CONSTRUCTIVIST AND EXPERIENTIAL LEARNING THEORIES INTO INNOVATIVE FORMATIVE ASSESSMENT OF SCIENCE EDUCATION**

In the science education, constructivist theory underscores that the learners actively build scientific understanding through inquiry, exploration, and reflection (Windschitl, 2002), while experiential learning highlights the importance of engaging learners in concrete tasks involving observation, experimentation, and application (Kolb and Kolb, 2017). Together, these perspectives inform pedagogical approaches that prioritise inquiry-based learning, collaborative investigation, and real-world problem-solving.

Learners are encouraged to question phenomena, design investigations, analyse evidence, and communicate findings in ways that reflect authentic scientific practices (Hmelo-Silver *et al.*, 2007). Such learner-centred approaches promote deeper conceptual understanding and move beyond surface-level content coverage. Within this pedagogical framework, innovative formative assessment strategies are embedded to support continuous learning and reflective thinking.

Concept mapping enables learners to establish meaningful connections between scientific concepts and processes (Novak and Cañas, 2008). Reflective science journals foster metacognitive awareness by encouraging students to articulate observations, reasoning, and learning progression (Boud and Molloy, 2013). Performance-based assessments—including the hands-on experiments, model construction, and oral scientific explanations—evaluate not only content knowledge but also application, reasoning,

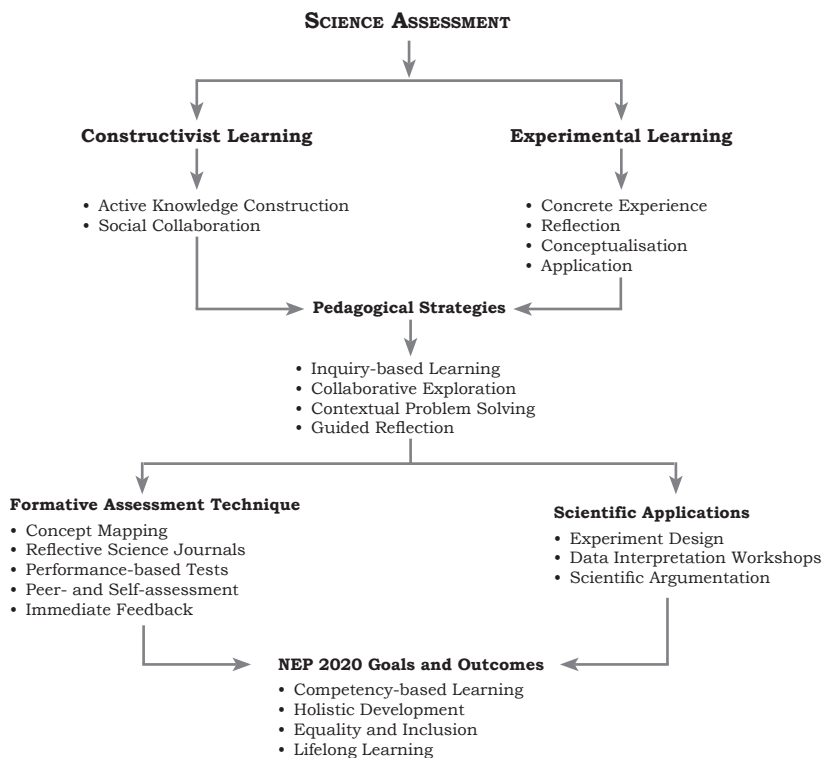


Fig. 2. A conceptual diagram depicting the constructivist and experiential approach to science education and assessment

and communication skills (Gulikers *et al.*, 2004). Peer and self-assessment strategies further enhance learner autonomy and collaborative engagement, while immediate feedback supports real-time learning and conceptual refinement (Shute, 2008).

These formative assessment practices are directly applied to core scientific activities such as experimental design, data interpretation, and scientific argumentation. By engaging in authentic scientific tasks, learners develop scientific literacy, critical thinking, and problem-solving capabilities, functioning as young scientists within classroom learning communities (Osborne, 2014). At a broader level, this integrated assessment approach supports holistic development, promotes equity and inclusion by offering multiple pathways for demonstrating understanding, and cultivates lifelong learning by equipping learners with transferable scientific reasoning skills and reflective habits (NCERT, 2023; PARAKH, 2023).

## **INNOVATIVE FORMATIVE LANGUAGE ASSESSMENT STRATEGIES**

### **Performance-based Evaluations**

Performance-based assessments engage learners in authentic, real-world language tasks such as business negotiations, medical consultations, debates, and professional presentations. These assessments foreground contextual language use and

strategic communication, thereby strengthening practical language proficiency and communicative competence (Utami *et al.*, 2021; Jollibekova, 2024).

For instance, literature circles require students to assume specific roles—such as summariser, discussion director, connector, or vocabulary enricher—and present analyses of selected chapters from texts such as “The Giver or To Kill a Mockingbird”. This approach promotes interpretative skills, collaborative learning, and critical engagement with literary texts.

### **Simulation Exercises and Role-playing**

Simulation-based activities immerse learners in realistic communicative scenarios, including mock interviews, customer service interactions, and institutional encounters. These tasks foster fluency, adaptability, and pragmatic language use while encouraging collaborative learning and problem-solving (Nykyoprets *et al.*, 2023; Huang *et al.*, 2024).

For example, in an ESL classroom, students may role-play an immigration officer and a traveller, requiring them to negotiate meaning, respond spontaneously, and apply functional language skills within contextually authentic situations.

### **Continuous Formative Assessment**

Continuous formative assessment strategies—including digital portfolios,

reflective journals, frequent low-stakes quizzes, and peer feedback—enable learners to monitor progress and refine learning strategies. These tools support personalised learning trajectories and sustained improvement across reading, writing, speaking, and listening skills (Soomro *et al.*, 2023; Fitria, 2020).

A practical illustration is “My English Growth Journal,” a digital portfolio maintained using platforms, such as Google Docs, Padlet, Seesaw, or OneNote, through which students regularly upload language tasks, reflect on progress, and receive formative feedback.

### **Technology and AI Integration**

Technology-enhanced assessments, including AI-driven tools, provide real-time feedback, adaptive learning pathways, and automated scoring. Applications such as classroom chatbots, computer-assisted language testing (CALT), speech recognition software, and virtual simulations enhance accessibility, efficiency, and accuracy, particularly in blended and remote learning environments (Sihag, 2023; Omonova, 2024).

### **Multimodal Assessment Techniques**

Multimodal assessments integrate videos, podcasts, digital storytelling, and interactive applications to accommodate diverse learning styles. By combining visual, auditory, and kinaesthetic modes, these strategies enhance the engagement, comprehension, and

retention while bridging theoretical learning with real-world application (Sawalmeh and Dey, 2023).

For example, students may create short video narratives (1–3 minutes) incorporating spoken narration, visuals, subtitles, and sound effects to demonstrate language proficiency creatively.

## **INNOVATIVE FORMATIVE SCIENCE ASSESSMENT STRATEGIES**

### **Classroom Response Systems (CRS)**

CRS enable real-time formative assessment through interactive polling and quizzes, allowing teachers to identify misconceptions and adjust instruction immediately. These systems promote engagement, peer learning, and critical thinking and can be integrated with virtual laboratories and gamified learning environments (Beatty and Gerace, 2009; Henderson and Farkas, 2020).

For instance, during a biology lesson on cell structure, CRS responses may reveal confusion between mitochondrial and chloroplast functions, prompting timely clarification.

### **Plickers**

Plickers offer a low-tech, equitable assessment solution using paper-coded response cards, enabling instant feedback without requiring student-owned digital devices. This approach supports concept checks, prior knowledge assessment, and inclusive participation (Howell *et al.*, 2017; Shana and Baki, 2020).

In a physics classroom, students may respond to questions on Newton's laws by holding up coded cards, allowing teachers to quickly identify misconceptions.

### **Sticky Bars**

Sticky Bars are visual formative assessment tools in which students place sticky notes on a graph to represent their understanding. This strategy promotes discussion and provides immediate insights into student thinking (Keeley, 2008).

For example, following a lesson on Earth's layers, students indicate which layer they believe is the hottest by placing their responses on a bar chart.

### **Triangle of Power**

The Triangle of Power framework connects concepts, skills, and real-world applications, thereby reinforcing scientific reasoning and integrated understanding (Chonowski, 2017).

In chemistry, students may explore acids and bases (concept), conduct neutralisation reactions (skill), and analyse the role of antacids in everyday life (application).

### **Before-During-After (BDA) Strategy**

The BDA framework structures learning by activating prior knowledge, engaging learners in hands-on inquiry, and encouraging reflection on outcomes. This approach deepens conceptual understanding and supports inquiry-based learning (K20 LEARN, n.d.).

For instance, in a lesson on photosynthesis, students brainstorm existing knowledge, conduct experiments on oxygen release, and synthesise findings through reflection.

### **Claim–Evidence–Reasoning (CER)**

The CER framework strengthens scientific literacy by guiding students to formulate claims, support them with evidence, and justify reasoning (McNeill and Krajcik, 2008).

For example, when analysing soil water retention, students articulate claims supported by quantitative data and scientific explanations.

### **Exit Tickets**

Exit tickets provide brief reflective opportunities for students to summarise learning, pose questions, and connect concepts to real-life contexts. This strategy supports learner self-reflection and instructional adjustment (K20 LEARN, n.d.).

### **Aligning Assessment Strategies with NEP 2020 Goals**

The National Education Policy (NEP) 2020 represents a paradigm shift from rote-based, high-stakes examinations towards competency-based, holistic, and formative assessment systems. It reconceptualises assessment as an integral component of learning, emphasising continuous feedback, conceptual understanding, real-world application, and learner agency.

### **Transition to Competency-based Assessment**

NEP 2020 advocates assessment models that prioritise higher-order thinking, creativity, and problem-solving over memorisation (Singh and Kaur, 2023). Formative strategies, such as peer assessment, simulations, CRS, and exit tickets support continuous monitoring of learning and timely pedagogical interventions (Black and Wiliam, 1998; Henderson and Farkas, 2020).

### **Constructivist and Experiential Approaches**

Grounded in constructivist and experiential learning theories (Piaget, 1954; Vygotsky, 1978; Kolb, 1984), NEP 2020 promotes inquiry-based, interactive, and experiential learning. Assessment tools such as CER, role-play, multimodal tasks, and hands-on experiments facilitate knowledge construction and authentic learning experiences.

### **Role of PARAKH**

PARAKH plays a central role in standardising competency-based assessments across school boards, ensuring equity, conceptual clarity, and holistic evaluation (Borah, 2022). Its initiatives, including holistic progress cards and large-scale achievement surveys, align closely with the formative and skill-based assessment practices envisioned under NEP 2020 (NCERT, 2023).

### **Technology and AI Integration**

NEP 2020 highlights the transformative potential of technology-enabled assessments, including AI-driven feedback, adaptive testing, digital portfolios, and performance analytics. These tools enhance scalability, inclusivity, and personalisation while maintaining assessment integrity (McKay, 2013; Sihag, 2023).

### **Holistic and Inclusive Evaluation**

The policy emphasises multimodal, flexible, and inclusive assessment practices that recognise cognitive, social, and emotional development. Reflective journals, digital portfolios, and 360-degree progress cards promote self-awareness, equity, and lifelong learning (Sujatha, 2024).

## **FEASIBILITY CONSIDERATIONS FOR IMPLEMENTATION**

### **Teacher Capacity and Professional Development**

Sustained professional development is essential for enabling teachers to translate constructivist and experiential pedagogies into effective formative assessment practices. Without continuous mentoring and reflective opportunities, educators may revert to traditional assessment modes despite endorsing learner-centred approaches (Guskey, 2000). Collaborative professional learning communities, particularly at cluster or district levels, support the institutionalisation of innovative practices (Darling-Hammond *et al.*, 2017; Fullan, 2007).

### **Policy Alignment and Curricular Flexibility**

NEP 2020 and the National Curriculum Framework (NCERT, 2023) provide strong policy mandates for embedding formative assessment within subject curricula. However, where content-heavy syllabi persist, schools may need to reinterpret curricular standards or negotiate with examination boards. PARAKH's standardised rubrics and exemplars offer crucial support for integrating formative assessment without compromising board requirements (Sujatha, 2024).

### **Resource Availability and Low-cost Alternatives**

Resource constraints—particularly in rural and underfunded schools—pose significant challenges to the implementation of hands-on experiments, digital platforms, and laboratory-based formative assessments. Limited access to reliable electricity, internet connectivity, and well-equipped laboratories continues to affect many regions (UNESCO, 2015), with rural schools especially lacking the infrastructure required for experimental science learning or digital portfolio-based assessments (PRATHAM, 2020).

Despite these constraints, several low-cost yet high-impact formative assessment strategies can be effectively implemented with minimal resources. Paper-based concept mapping, structured group discussions, oral presentations,

peer questioning, and teacher observational checklists offer viable alternatives that support conceptual understanding and skill development without dependence on advanced technology. Over time, phased implementation supported by government initiatives, CSR funding, or public–private partnerships may enable schools to gradually acquire basic science apparatus and affordable digital devices for documentation, feedback, and assessment tracking.

### **Student Engagement and Inclusivity**

Formative assessment practices—particularly self- and peer-assessment accompanied by descriptive, actionable feedback—have been shown to enhance learner motivation and foster self-regulated learning (Nicol and Macfarlane-Dick, 2006). By offering differentiated assessment modalities, such as oral or audio-based responses for language learners and simplified observation tools for practical science activities, teachers can better accommodate diverse learning needs, abilities, and linguistic backgrounds.

Such inclusive assessment practices promote learner agency, confidence, and participation, aligning closely with the principles of equity and accessibility emphasised in both constructivist and experiential learning frameworks. They also ensure that assessment serves as a tool for learning rather

than exclusion, particularly for first-generation learners and students from marginalised contexts.

### **Monitoring and Continuous Improvement**

The sustainability of formative assessment reforms depends on the systematic monitoring mechanisms and a commitment to continuous improvement. Regular data review, collaborative teacher reflection forums, and iterative feedback loops allow schools to evaluate the effectiveness of assessment practices and address emerging challenges in implementation (Fullan, 2007). Drawing on Guskey's (2000) model of professional development evaluation, schools can assess the impact of formative assessment reforms across multiple dimensions, including teacher learning, instructional change, organisational support, and student learning outcomes.

PARAKH's emphasis on periodic audits, exemplar-based benchmarking, and portfolio reviews further strengthens alignment with NEP 2020 goals. Institutional structures such as monthly teacher collaboration meetings and bi-annual student progress reviews help to embed formative assessment within a responsive, self-correcting, and evidence-informed system.

### **CONCLUSION**

The National Education Policy (NEP) 2020 represents a transformative shift in India's educational assessment

framework, advocating a move away from rote-based, summative evaluations towards competency-driven, holistic, and formative assessment practices. This paper has highlighted the significance of innovative formative assessment strategies in language and science education, emphasising their role in fostering critical thinking, conceptual understanding, and the meaningful application of knowledge in real-world contexts.

The integration of constructivist and experiential learning principles—supported by technology-enabled, personalised assessment approaches—aligns closely with the NEP 2020's vision of learner-centred and skill-oriented education for the twenty-first-century. The establishment of PARAKH plays a crucial role in standardising and ensuring equity in assessment practices across school boards, thereby strengthening the nationwide implementation of competency-based evaluations. The incorporation of AI-driven tools, adaptive learning technologies, and multimodal assessment strategies further enhances the inclusivity, scalability, and responsiveness of the assessment ecosystem.

By adopting performance-based evaluations, peer- and self-assessment practices, and digital and low-tech formative tools, educators can bridge learning gaps, enhance student engagement, and foster meaningful, lifelong learning experiences. Ultimately, the transition towards holistic, technology-integrated, and

competency-based assessment not only improves educational outcomes but also equips learners with higher-order thinking skills, problem-solving abilities, and adaptability—capabilities essential for navigating the demands of an increasingly

complex global knowledge economy. As India progresses towards the full realisation of NEP 2020, these reformed assessment practices will be instrumental in shaping an inclusive, innovative, and future-ready education system.

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# Teaching All, Reaching All

## Pre-service Teachers' Efficacy in Managing Diverse Classrooms

KRISHNA KUMAR RAJAK\* AND PRAGYA GUPTA\*\*

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### Abstract

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*Aligned with the National Education Policy (NEP) 2020's emphasis on inclusive education, this study examines pre-service teachers' efficacy in addressing diverse learning needs and explores the key factors influencing their ability to manage inclusive classrooms effectively. A mixed-methods research design was employed to achieve the stated objectives. Data were collected from 165 pre-service teachers using the Teacher Efficacy for Inclusive Practices (TEIP) scale and open-ended questions. The findings reveal no significant gender differences in overall teaching efficacy; however, male participants demonstrated marginally higher efficacy in classroom management and collaborative practices. The study also identifies several constraints affecting pre-service teachers' preparedness, including limited practical exposure, inadequate resources, inaccessible infrastructure, and insufficient support from key stakeholders. These challenges hinder their ability to manage diverse classroom needs and behaviours effectively. The findings underscore the need for comprehensive teacher education programmes that integrate strong theoretical foundations with meaningful practical experiences, particularly in the areas of adaptive instructional strategies and inclusive classroom management. This study contributes to the broader discourse on teacher preparation by highlighting how enhanced self-efficacy can facilitate the creation of equitable learning environments that accommodate learner diversity. It further emphasises the importance of sustained professional development to bridge persistent gaps in the implementation of inclusive practices.*

**Keywords:** Pre-service Teachers, Teaching Efficacy, Inclusive Practices, Classroom Management

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## INTRODUCTION

Inclusive education has emerged as a critical global priority, as reflected in UNESCO's sustained advocacy (UNESCO, 1994, 2015). This commitment is further reinforced by Sustainable Development Goal 4, which calls for "inclusive and equitable quality education and lifelong learning opportunities for all" (UNESCO, 2009, 2015). While the philosophical foundations of Inclusive Education (IE) have gained widespread international acceptance, many countries continue to face challenges in transforming educational systems to accommodate all learners within inclusive settings (Loreman, 1999).

In India, the National Education Policy (NEP) 2020 addresses these challenges through targeted measures such as specialised teacher training, alternative assessment mechanisms under PARAKH, flexible schooling options, and technology-mediated parental engagement (NEP 2020, Sections 6.12–6.14). Despite this policy alignment, operational definitions, and classroom-level enactments of inclusive practices remain highly variable (Slee, 2001).

The National Curriculum Framework for Teacher Education (NCTE, 2009) underscores the centrality of teacher competence in achieving inclusive education, emphasising that teachers' pedagogical knowledge, attitudes, and skills form the foundation for effective inclusive classroom practices. However, the implementation of Inclusive Education

is a complex, multi-dimensional process influenced by interrelated systemic, institutional, and individual factors (Mitchell, 2015; Schuelka and Engsig, 2020).

Teachers play a pivotal role in translating inclusive education policies into classroom realities, as their instructional decisions and pedagogical adaptability significantly shape students' learning experiences (Soodak *et al.*, 1998). Contemporary teacher education programmes aim to prepare future educators for diverse classrooms by integrating theoretical knowledge, pedagogical strategies, subject expertise, and practicum experiences. Research indicates that pre-service teachers' efficacy beliefs and attitudes strongly influence their instructional practices, professional confidence, and willingness to adopt inclusive strategies—often more so than other components of teacher training (Krischler and Pit-ten Cate, 2019).

Empirical studies suggest that pre-service teachers with prior exposure to inclusive classrooms tend to hold more positive attitudes towards the inclusion of students with disabilities (Varcoe and Boyle, 2014), and these attitudes often persist throughout teacher education programmes (Beacham and Rouse, 2012). Consequently, pre-service teacher education is widely recognised as a critical phase for developing the competencies necessary for effective inclusive teaching (Loreman *et al.*, 2005, 2006, 2007).

While inclusive education courses have been shown to improve pre-service teachers' attitudes and self-efficacy (Burton and Pace, 2009; Carroll *et al.*, 2003), they have also been criticised for overemphasising theoretical knowledge at the expense of practical skill development (Boe *et al.*, 2007). This mismatch contributes to a persistent theory–practice gap in inclusive education implementation (McLeskey and Billingsley, 2008). Research consistently highlights concerns regarding pre-service teachers' preparedness to manage diverse classrooms effectively (Druckman and Bjork, 1994; Sharma *et al.*, 2009), with particular gaps noted in classroom management, instructional differentiation, and institutional support (Yasmin *et al.*, 2020).

Assessing pre-service teachers' beliefs, efficacy, and readiness for inclusive education is therefore essential. Although some teachers express confidence in their ability to support diverse learners, significant theoretical and logistical challenges continue to impede the realisation of full inclusion (Glenn, 2018; Jordan, 2018; Silverman, 2010). Moreover, teachers' efficacy in implementing inclusive practices varies considerably based on training experiences and personal beliefs about inclusion (Loreman *et al.*, 2013; Miesera *et al.*, 2019).

## **THEORETICAL BACKGROUND**

Self-efficacy refers to an individual's belief in their capability to organise

and execute actions required to achieve specific goals (Bandura, 1997). Within educational research, Bandura's social cognitive theory has been extensively applied to examine teachers' confidence in supporting diverse learners and implementing inclusive practices (Ahsan *et al.*, 2012; Loreman *et al.*, 2013; Sharma *et al.*, 2012). Teacher self-efficacy is regarded as one of the few teacher-related attributes that directly influence student outcomes, making it a critical construct in inclusive education research (Hoy *et al.*, 2009).

The construct of teacher self-efficacy is particularly relevant to inclusive education, as it is closely linked to actual classroom practices and instructional decision-making (Tschannen-Moran, Hoy, and Hoy, 1998). Bandura (1997) identifies four primary sources of efficacy beliefs: mastery experiences, vicarious experiences, verbal persuasion, and emotional or physiological states.

Mastery experiences, derived from prior successful performance, are the most powerful source of efficacy beliefs, as they provide concrete evidence of competence and resilience in the face of challenges (Bhati and Sethy, 2022). Vicarious experiences, gained through observing others, contribute to efficacy development but exert a comparatively weaker influence than direct experiences (Skaalvik and Skaalvik, 2007). Verbal persuasion, such as constructive feedback from mentors and peers, can enhance efficacy when it is specific, consistent, and credible. Finally,

emotional and physiological states influence individuals' perceptions of competence, as heightened stress or anxiety may undermine confidence, while positive emotional states can enhance perceived capability (Bandura, 1997).

In inclusive education contexts, classroom management efficacy represents a crucial dimension of teachers' self-efficacy, particularly when addressing diverse learner needs. Although substantial empirical evidence supports the benefits of inclusive education, research has consistently examined the challenges teachers face in managing behaviour and delivering differentiated instruction in inclusive classrooms (Romi and Leyser, 2006). Pre-service teachers who employ differentiated instructional strategies and effective behaviour management techniques, tend to demonstrate higher perceived efficacy, despite encountering implementation challenges (Main and Hammond, 2008; Mergler and Tangen, 2010; Shaukat *et al.*, 2013).

Educators with strong self-efficacy beliefs are more likely to adopt varied behaviour management strategies (Woolfolk *et al.*, 1990), implement inclusive pedagogical practices effectively, and utilise research-based instructional approaches (Guskey, 1988). Understanding pre-service teachers' efficacy beliefs is therefore essential for strengthening teacher preparation programmes and ensuring the successful implementation of inclusive education.

## TEACHING EFFICACY AND INCLUSIVE PRACTICES

Grounded in Bandura's (1995) social cognitive theory, self-efficacy refers to an individual's belief in their capability to plan and execute actions required to achieve specific goals. Unlike general self-confidence, Bandura's conceptualisation emphasises context-specific competencies, recognising that efficacy beliefs are task- and situation-dependent (Loreman *et al.*, 2013). Within the field of inclusive education, teachers' self-efficacy has increasingly been recognised as a crucial indicator of their effectiveness in managing diverse classroom contexts (Sharma, Loreman, and Forlin, 2012; Weisel and Dror, 2006). These beliefs encompass both perceived competence and confidence and are predominantly examined through Bandura's theoretical framework (Bruder *et al.*, 2013; Kawamura, 2007).

Teacher self-efficacy significantly influences classroom practices, pedagogical decision-making, and professional attitudes. Empirical evidence suggests that nearly 25 teaching practices are directly shaped by teachers' attitudinal dispositions (Damianidou and Phtiaka, 2018). Effective implementation of inclusive education requires educators to adopt attitudes that prioritise equity, access, and meaningful learning opportunities for all students (Navarro-Mateu *et al.*, 2020).

Studies further indicate that teachers with positive attitudes demonstrate greater instructional flexibility and adaptability in responding to diverse learner needs (Ismailos *et al.*, 2019).

Research also highlights a strong association between teachers' attitudes and their pedagogical effectiveness. Educators with favourable dispositions are more likely to implement evidence-based inclusive strategies consistently, whereas negative attitudes often hinder inclusive practice adoption. Teachers' professional knowledge plays a mediating role in this process, as limited understanding of inclusive principles is frequently associated with reduced instructional adaptation and strategy use (Kurniawati *et al.*, 2017). Therefore, the development of positive attitudes alongside robust professional knowledge is essential for the successful implementation of inclusive practices in mainstream classrooms.

Classroom management efficacy has been identified as a critical component of effective inclusive education. Research demonstrates a significant relationship between teacher effectiveness and successful classroom management in inclusive settings (Chao *et al.*, 2018). Educators with high self-efficacy exhibit stronger organisational skills, greater instructional enthusiasm, and more equitable teaching practices. They are also more inclined to adopt differentiated and innovative strategies to meet diverse learner

needs (Marković, 2022). Comparative studies reveal that the teachers with high self-efficacy invest greater effort, demonstrate increased resilience, and display higher adaptability in facilitating student learning than those with lower efficacy beliefs (Schwab and Alnahdi, 2020).

The reciprocal relationship between self-efficacy and inclusive practice implementation is well established, whereby successful teaching experiences reinforce professional confidence, motivation, and sustained engagement with inclusive practices (Subban *et al.*, 2021). Cross-cultural studies using the Teacher Efficacy for Inclusive Practices (TEIP) scale have reported significant variations in teachers' efficacy beliefs across national contexts (Sharma, Loreman, and Forlin, 2012). Similarly, applications of the Teacher Sense of Efficacy Scale (TSES) have generally reported high levels of teacher efficacy (Smith, 2012; Tschannen-Moran and Hoy, 2001). However, as noted by Bruder *et al.* (2013), further research is required to identify the specific factors shaping teacher efficacy beliefs and to determine which components of teacher education most effectively foster professional self-efficacy.

Contemporary research has increasingly focused on three core dimensions of inclusive teaching efficacy: instructional adaptation, collaborative competence, and behaviour management (Sharma and Jacobs, 2016; Sharma, Loreman *et al.*, 2012). Recent

studies have specifically examined efficacy levels among educators working with diverse learner populations (Crispel and Kasperski, 2021; Marković, 2022), building on over three decades of scholarship exploring the relationship between teacher efficacy and classroom practice.

Assessing self-efficacy among pre-service teachers serves dual purposes: evaluating the effectiveness of teacher preparation programmes and informing targeted curricular improvements (Bruder *et al.*, 2013). As Macmillan and Meyer (2006) emphasise, cultivating strong self-efficacy beliefs during initial teacher education is fundamental to the successful implementation of inclusive education, and to addressing the complexities of classroom diversity.

## PURPOSE OF THE STUDY

The present study aims to assess pre-service teachers' efficacy in implementing inclusive educational practices and to identify key factors influencing their ability to manage diverse classroom environments effectively. Specifically, the study focuses on three interrelated dimensions:

- the development of teacher confidence,
- the formation of inclusive attitudes, and
- the cultivation of teaching efficacy required to create adaptable and inclusive learning environments.

Through systematic analysis of these dimensions, the study seeks to examine how teacher education curricula can be strengthened to prepare better future educators for diverse learner needs. The findings are expected to provide empirical evidence to support the restructuring of teacher preparation programmes, particularly through the incorporation of targeted training components that enhance inclusive teaching competencies.

Beyond the pre-service teacher development, the study has broader implications for improving learning outcomes among diverse student populations and advancing educational equity. By addressing the gap between theoretical preparation and practical classroom demands, the research contributes to the professionalisation and sustainability of inclusive teaching practices within mainstream education systems.

## RESEARCH OBJECTIVES

**RO<sub>1</sub>:** To examine gender differences in the pre-service teachers' efficacy regarding the implementation of inclusive practices.

**RO<sub>2</sub>:** To explore the classroom management challenges encountered by the pre-service teachers.

**RO<sub>3</sub>:** To identify key factors contributing to pre-service teachers' efficacy to managing inclusive classrooms effectively.

## METHODOLOGY

### Research Design

The study employed a mixed-methods research design (Ary, *et al.*, 2010), integrating quantitative and qualitative approaches to comprehensively address the research objectives. This design facilitated methodological triangulation and enhanced the validity and depth of the findings by allowing complementary insights from multiple data sources.

### Participants

The sample comprised 165 final-year pre-service teachers, including 75 females and 90 males. All participants had completed a compulsory course on inclusive education and had fulfilled their practicum requirements in mainstream classroom settings.

### Instrument

The Teacher Efficacy for Inclusive Practices (TEIP) scale (Sharma *et al.*, 2012) was used to measure the pre-service teachers' efficacy beliefs. The TEIP scale is a widely used and validated instrument in inclusive education research (Ahsan *et al.*, 2012; Park *et al.*, 2014; Shaukat *et al.*, 2013; Specht, 2016; Specht and Metsala, 2018), although findings across contexts have shown variability.

Adapted from the Educators' Perceptions Scale, the TEIP comprises 18 items, rated on a six-point Likert scale (1 = strongly disagree to 6 = strongly agree). Exploratory

factor analysis during the scale's development reduced the original 30 items to 18 statements, evenly distributed, across three domains:

- Efficacy in Inclusive Instruction (EII),
- Efficacy in Collaboration (EC), and
- Efficacy in Managing Behaviour (EMB) (Park *et al.*, 2014).

The instrument demonstrates high internal consistency (Cronbach's  $\alpha = 0.89$  for total scores; Sharma *et al.*, 2012), with total scores ranging from 18 to 108 (Sharma and Sokal, 2015). Confirmatory factor analysis further validated the tri-dimensional structure, highlighting the interrelated nature of the three efficacy constructs (Park *et al.*, 2014).

To address the second research objective, open-ended questions were included to explore classroom management challenges faced by pre-service teachers in inclusive settings. For the third objective, an extensive review of existing literature was conducted to identify factors influencing teaching efficacy in managing inclusive classrooms.

### Data Collection and Interpretation

Data were collected using a survey method through direct administration of questionnaires (Ary *et al.*, 2010). The questionnaires were administered to 165 pre-service teachers enrolled in the teacher education programme, at the Central University of South Bihar (CUSB), Gaya, Bihar.

**Table 1**  
**Descriptive statistics of the study**

| Variable   | N   | Min | Max | Mean  | SD    | Skewness | Kurtosis |
|------------|-----|-----|-----|-------|-------|----------|----------|
| TEIP Scale | 165 | 62  | 108 | 90.59 | 9.174 | -0.368   | 0.386    |

Initial descriptive analysis indicated a non-normal distribution of the data, as evidenced by significant results from both the Kolmogorov–Smirnov test ( $D = 0.093$ ,  $p < .001$ ) and the Shapiro–Wilk test ( $W = .974$ ,  $p < .003$ ). Consequently, non-parametric statistical methods were employed for data analysis using SPSS (Version 2020) to ensure appropriate interpretation of the non-normally distributed dataset.

## FINDINGS

### Gender Differences

The analysis revealed that, these are no statistically significant gender difference in teaching efficacy for inclusive practices ( $z = -0.097$ ,  $p > 0.05$ ). The findings indicate comparable levels of teaching efficacy among both male (mean rank = 83.33) and female (mean rank = 82.61)

pre-service teachers. Participants demonstrated notable competence in engaging parents, collaborating with itinerant teachers and allied professionals, and managing classroom behaviour effectively.

Although male participants exhibited marginally higher efficacy in behaviour management and collaborative practices, female participants demonstrated relatively stronger efficacy in implementing inclusive instructional strategies.

These findings are consistent with studies, reporting similar teaching efficacy across genders (Vogiatzi *et al.*, 2022; Bosse and Spörer, 2014). However, contrasting evidence exists in the literature, with some studies reporting higher efficacy among female pre-service teachers (Specht and Metsala, 2018; Shaukat *et al.*, 2013; Gao and Mager, 2011;

**Table 2**  
**Result of Mann-Whitney U test (Factors-wise Gender difference)**

| Factors of the TEIP scale | Gender | N  | Mean Rank | z-Value | p-Value    |
|---------------------------|--------|----|-----------|---------|------------|
| EII                       | Male   | 90 | 80.19     | -0.834  | $p > 0.05$ |
|                           | Female | 75 | 86.37     |         |            |
| EMB                       | Male   | 90 | 85.45     | -0.219  | $p > 0.05$ |
|                           | Female | 75 | 80.06     |         |            |
| EC                        | Male   | 90 | 83.74     | -0.219  | $p > 0.05$ |
|                           | Female | 75 | 82.11     |         |            |
| Total TEIP                | Male   | 90 | 83.33     | -0.097  | $p > 0.05$ |
|                           | Female | 75 | 82.61     |         |            |

Forlin *et al.*, 2010), while others have found greater efficacy among male pre-service teachers (Ismailos *et al.*, 2019; Specht, 2016; Ahsan *et al.*, 2012). These mixed findings suggest that teaching efficacy may be shaped more by contextual and experiential factors than by gender alone.

### **CLASSROOM MANAGEMENT CHALLENGES ENCOUNTERED BY PRE-SERVICE TEACHERS**

In line with the second research objective, open-ended responses from 165 pre-service teachers were analysed to explore classroom management challenges encountered in inclusive settings. The data were thematically analysed using the auto-coding technique in NVivo 15 (trial version). The findings revealed that the challenges emerged from multiple intersecting dimensions, primarily rooted in administrative, structural, instructional, and attitudinal constraints.

#### **Structural and Resource Barriers**

The implementation of inclusive education was found to be hindered by significant structural and resource-related barriers, including inaccessible infrastructure and inadequate teaching resources. Pre-service teachers frequently reported that the absence of ramps, poorly designed classrooms, and lack of accessible facilities limited the participation of students with disabilities. Additionally, respondents highlighted shortages of learning

materials, ICT tools, and assistive technologies, which restricted their ability to address diverse learning styles effectively. These findings align with previous studies that identify inadequate physical infrastructure and resource scarcity as major impediments to inclusive education (Lakshmi, 2018; Priyanka and Samia, 2018; Bhatnagar and Das, 2014).

#### **Insufficient Support Services and Rigid Curricula**

The study further revealed the systemic challenges such as rigid curricula, oversized classes, limited individualised support, and inadequate collaboration among stakeholders. Pre-service teachers reported that these factors significantly constrained their preparedness for inclusive classrooms. The lack of mentoring support and inflexible curricular frameworks limited opportunities for differentiated instruction and adaptive teaching practices (Ainscow, 2020; Mukherjee and Bear, 2017; Bhatnagar and Das, 2014).

#### **Social and Attitudinal Barriers**

Social and attitudinal factors also emerged as prominent barriers to inclusion. While parental involvement is known to enhance academic and social outcomes (Lau *et al.*, 2011), many participants reported minimal parental engagement and exclusion from educational decision-making processes. Respondents identified negative attitudes, social stigma,

and discriminatory practices from peers and school personnel as factors contributing to unwelcoming classroom environments. One participant noted that, “negative attitudes and low expectations from teachers result in isolation, low self-esteem, and reduced engagement among students with disabilities.”

Additionally, teachers with unfavourable attitudes towards inclusion were perceived as less willing to teach students with disabilities, citing the additional demands of assistive technology, individualised support, and differentiated pacing. Consistent with earlier research, practicum experiences further revealed classroom management, time management, instructional delivery, and anxiety regulation as significant challenges for pre-service teachers (Weber and Greiner, 2019; Ahsan *et al.*, 2013).

### **Professional and Instructional Challenges**

Pre-service teachers reported insufficient training and limited practical experience in planning instruction and assessment for diverse classrooms. The participants expressed difficulty in balancing the needs of students with disabilities alongside the rest of the class due to time constraints, limited access to assistive technologies, and insufficient collaboration with the stakeholders. The findings also revealed a lack of trained personnel, limited awareness of disability-related

issues, and insufficient sensitisation towards inclusive education among the stakeholders. These findings corroborate earlier studies highlighting similar professional and instructional constraints (Priyanka and Samia, 2018).

### **FACTORS INFLUENCING TEACHING EFFICACY IN MANAGING AN INCLUSIVE CLASSROOM**

#### **Teaching Self-efficacy and Attitudes**

Extant literature consistently demonstrates a strong positive relationship between teachers' self-efficacy beliefs and supportive attitudes towards inclusive education (Savolainen *et al.*, 2012). Teachers with higher self-efficacy are more effective in promoting student engagement (Zee and Koomen, 2020), fostering positive teacher–student relationships (Holzberger *et al.*, 2014), and improving academic outcomes (Kim and Seo, 2018; Caprara *et al.*, 2006).

Pre-service teachers with positive attitudes towards inclusion show greater confidence in implementing inclusive instructional strategies and managing classroom behaviour, which contributes to improved classroom climate, student satisfaction, and group cohesion (Buric and Kim, 2020; Monsen *et al.*, 2014).

#### **Professional Training and Skill Development**

Comprehensive professional training and sustained practicum exposure,

are essential for enhancing teachers' confidence and competence in inclusive classrooms (Forlin *et al.*, 2010). Structured professional development integrating Universal Design for Learning (UDL), adaptive pedagogy, and evidence-based behaviour management strategies, are critical. Empirical evidence indicates that immersive teaching experiences with diverse learners significantly strengthen behaviour management efficacy (Specht and Metsala, 2018).

### **Access to Resources and Support Systems**

Teaching efficacy is strongly influenced by access to instructional resources, assistive technologies, and institutional support. The use of digital tools and adaptive technologies enhances student engagement and reduces behavioural challenges (González-Pérez, 2014; Simonsen *et al.*, 2008). Leadership commitment and collaborative frameworks involving special educators and administrators further strengthen inclusive practice (Ainscow and Sandill, 2010; Florian and Black-Hawkins, 2011).

### **Classroom Environment and Student Diversity**

Inclusive classroom management requires flexible, learner-centred pedagogies, and supportive learning environments. Research highlights the importance of differentiated instruction, positive behaviour support, and responsive teaching

practices in promoting engagement among diverse learners (Tomlinson, 2014; Kahveci, 2023). Optimal class sizes, co-teaching models, and favourable student-teacher ratios further facilitate effective classroom management (Friend, 2008; Blatchford *et al.*, 2003).

### **Policy, Collaboration, and Peer Support**

Supportive institutional policies and sustained professional development enable teachers to implement inclusive practices more effectively (Oliver and Reschly, 2007). Collaboration among educators, specialists, parents, and administrators strengthens teacher efficacy and promotes inclusive school cultures (Epstein, 2011; Friend and Cook, 2010).

## **DISCUSSION AND CONCLUSION**

The present study found no significant gender differences in overall teaching self-efficacy, consistent with prior research (Vogiatzi *et al.*, 2022; Bosse and Spörer, 2014). However, minor variations were observed, with male pre-service teachers reporting slightly higher efficacy in behaviour management. These findings suggest that teacher education programmes effectively develop pedagogical, collaborative, and classroom management skills, supporting Bandura's (1997) assertion that mastery experiences enhance self-efficacy.

Despite comparable efficacy across genders, substantial implementation

challenges persist, including inadequate infrastructure, limited resources, rigid curricula, large class sizes, and insufficient institutional support. Pre-service teachers reported feeling inadequately prepared for inclusive classrooms, particularly in behaviour management and instructional adaptation, highlighting a persistent theory–practice gap. Limited exposure to inclusive settings during training, underscores the need for curriculum reform that integrates sustained practicum experiences

with diverse learners (Lancaster and Bain, 2010; Brownell *et al.*, 2005).

Overall, effective inclusive education requires comprehensive systemic support, encompassing flexible infrastructure, learner-centred pedagogies, appropriate class sizes, adequate resources, and ongoing professional development. Without these structural and institutional reforms, inclusive classrooms will continue to challenge teacher effectiveness and constrain student potential (Zwane and Malale, 2018).

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# Empowering Readers

## The Impact of Self-efficacy on Secondary School Students' Reading Ability

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### Abstract

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*Reading is regarded as the most crucial among the four essential competencies of English. This study set out to explore how self-efficacy influences the reading abilities of secondary school students. To gather meaningful insights, researchers adopted a descriptive survey approach along with a quantitative research design. Data were collected from secondary schools located across four districts in West Bengal. A sample of 501 students was selected using stratified random sampling. To collect data, two standardised tools were employed: (i) Self-efficacy Scale (SES) developed by Singh and Narain (2005), and (ii) Silent Reading Ability Test (SRAT) to assess the students' reading ability. Statistical techniques, such as mean, median, t-test, Pearson's product-moment correlation coefficient, and regression were used for data analysis. The findings revealed that self-efficacy influences the reading ability of students in government-aided secondary schools. The study has implications for teachers and policymakers and recommends targeted intervention strategies to improve self-efficacy and reading proficiency and promote equity and Inclusion among secondary school students.*

**Keywords:** Self-efficacy, Reading, Reading Ability, Government-aided school, Secondary school students.

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### INTRODUCTION

In the 1970s, the concept of self-efficacy was introduced by Albert Bandura, which stems from social cognitive theory. It is a belief of an individual in his own ability to fulfil tasks and achieve the goal.

This belief significantly impacts how individuals think, feel, and behave, influencing their motivation and performance across different areas, including academics. (Bandura, 1977). According to Bandura (1997), those with strong self-efficacy tend to set ambitious goals, remain resilient

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when facing challenges, and bounce back quickly from setbacks, all of which contribute to improved performance. Students with self-efficacy can determine how much effort is required to be put in and how long they can handle a particular task. Students can know their capabilities in facing the obstacles in any challenge, they can measure and judge themselves (Apriliyani *et al.*, 2023). The framework of self-efficacy includes four main elements, as Bandura (1997) stated: mastery experiences achieved after completing a task, vicarious experiences and verbal persuasion, and emotional states. These components highlight that self-efficacy is not fixed; rather, it is a dynamic trait shaped by both internal influences and external circumstances.

The academic achievement and performance are linked by self-efficacy (Salami and Ogundokun, 2009, as cited by Siddiqui, 2015). Studies have shown that higher self-efficacy leads to better academic performance and enhanced retention. The role played by perceived self-efficacy in academic performance has been investigated by many of the researchers at different levels. It is confirmed from the research findings that students' academic performance is influenced by their self-efficacy (Baruah, 2024) and mediates the effect of skills on these attainments (Sharma, 2014). In the realm of education, self-efficacy constitutes a fundamental factor

in influencing students' academic motivation and their subsequent achievements. In the generative system of human competence, efficacy beliefs act as a key factor. Effective functioning requires a combination of both skills and strong self-efficacy beliefs (Bandura, 1997). Research shows that students adopt learning strategies effectively when they have high self-efficacy, remain persistent in their efforts, and perform better academically (Schunk, 1991).

## **CONCEPTUAL FRAMEWORK OF SELF-EFFICACY: NATURE AND DEVELOPMENT**

### **Nature of Self-efficacy**

Bandura (1997) explains that self-efficacy is not purely a cognitive ability and incorporates cognitive judgement about one's capability, affective emotions, such as anxiety, confidence, and behavioural elements like persistence, effort, and choice of academic task. How learners think, feel, and act is affected by self-efficacy in learning situations (Bandura, 1977). Thus, self-efficacy is a construct with multiple dimensions and not a cognitive skill alone.

### **Acquisition of Self-efficacy**

According to Bandura (1997), self-efficacy is acquired through developmental experiences and is not inherited or congenital. Students form efficacy beliefs in school circumstantially on the basis of experiences. Peer groups,

the institutional setting, the home environment, and teacher behaviour all have an influence on these experiences. Thus, self-efficacy is an acquired and dynamic belief system which evolves with new experiences based on circumstances (Bandura, 1977, 1997).

According to Bandura (1997), students can acquire self-efficacy independently through circumstantial learning experiences. When a student attempts successful reading, they build mastery-based self-efficacy (Apriliyani and Usuludin, 2023). According to Schunk (1991), vicarious learning is enhanced by observing peers' success. Students, through self-regulation, goal setting, and exposure to a supportive environment, gain confidence (Yang *et al.*, 2018). Provision of varied reading resources and exposure to language outside the classroom in the Indian context influence these experiences (Burgoyne *et al.*, 2013). Students in government-aided schools may experience limited resources, which affects these opportunities and requires additional support.

According to Schunk (1991), following are some pedagogical interventions to strengthen students' self-efficacy:

### ***Mastery-based Instruction***

Among the foremost sources of efficacy beliefs, according to Bandura (1997), is graded reading tasks, beginning with simpler texts to ensure success incrementally. In this

way, students' reading self-efficacy increases through consistent mastery (Zhang, 2013).

### ***Modelling and Peer Learning***

The teacher demonstrates reading strategies and peer modelling to help students in reading. High and low efficacy students can be paired for collaborative reading. For Adolescents who rely on peer comparison, vicarious experiences are effective for them (Yang *et al.*, 2018), such as verbal persuasion and feedback.

Positive reinforcement encourages perseverance and boosts self-esteem (Schunk, 1991). Reading comprehension results are improved by teachers who provide constructive criticism, steer clear of unfavourable comparisons, and conduct non-threatening evaluation, encouraging feedback, avoidance of negative comparisons and non-threatening evaluation (Begum and Hamzah, 2018).

### ***Managing Emotional States***

Students' self-efficacy is directly strengthened when reading anxiety is reduced and a safe environment is established (Bandura, 1997). By lowering students' fear of failing, a supportive classroom enhances reading performance (Anggriawan *et al.*, 2023).

### ***Indian—Contextual and Cultural Tools***

Using reading materials that are familiar and culturally relevant improves comprehension and

confidence (Burgoyne *et al.*, 2013). DIKSHA resources, NCERT and WBBSE texts, and bilingual scaffolds align with the socio-linguistic needs of Indian students.

### *Reading*

Language learning and language acquisition depend on the development of listening, speaking, reading, and writing skills. Among the four, reading is considered indispensable in education. Reading skills are essential for both academic success and broader communication competence. Two groups under which the theories of reading are divided. One group considers reading as a process, while the other group considers reading as an ability comprised of components.

#### ● **Reading as an ability**

The true essence of reading is to extract the inferred message from the text. Hoover and Tunmer (1993) stated the following components of reading. (i) word recognition (ii) language (iii) background knowledge (iv) comprehension

#### ● **Word recognition and Phonological awareness**

In reading acquisition, phonological awareness is essential and delivers better learning outcome conversely lack of knowledge can inhibit reading proficiency. According to Siregar *et al.* (2023), those who possess strong phonological awareness perform better in reading than those who lack such awareness. Goswami(2010)

provides empirical data on how phonological awareness develops in relation to literacy. It discusses the causal connection between phonological awareness and literacy development.

#### ● **Language**

Syntax, like phonemic awareness, plays a vital role. In a language, syntax is a set of rules which governs the structure of the sentence. It is the meaningful arrangement of words and phrases that facilitates comprehension and meaning construction (Cao,2023). According to Chretien (2003), knowledge of syntax helps the readers construct meaning by breaking down texts into parts and integrating their own knowledge. Syntax provide structural foundation necessary for effective reading comprehension.

#### ● **Background knowledge**

Students acquire knowledge formally inside and informally outside the classroom through life experiences, which is known as background knowledge. Second language learners lack knowledge and have limited vocabulary in English needs specific intervention to build knowledge and skills (Burgoyne *et al.*, 2013).

#### ● **Comprehension**

Reading comprehension, according to Lockhart (n.d.), is the ability to read text, process it, and make inferences and is a multifaceted process that involves both

componential knowledge and skills. Reading comprehension can be defined as “a holistic procedure of constructing interpretation from a written passage by the interaction of the information the reader gathers from the comprehension passage, the reader’s interpretation of the language that the writer used in constructing the text, and the situation in which the text is read” (Lenz, 2005 cited by E *et al.*, 2019). Readers acquire information and experience while reading comprehension, and become aware of the world around lead to academic success (Anggriawan *et al.*, 2023).

According to Gough and Tunmer (1986) the simple view of reading suggests that language comprehension and reading skills are the two broad components of reading comprehension (Oakhill *et al.*, 2019). According to Arcos (2018), comprehension is a dynamic and active process that requires readers to engage with the text by linking it to their prior knowledge, which significantly influences their understanding of the material. Failure to do so may hinder their comprehension.

## LITERATURE REVIEW

Specifically, self-efficacy serves a pivotal role in reading proficiency by preparing students’ attitudes towards reading, their readiness to engage with difficult texts, and their overall reading comprehension abilities (Zhang, 2013). Begum and Hamzah (2018) investigated the relationship

between Self-Efficacy and teaching reading comprehension skills among secondary school teachers at Telangana State in India. It was found to be statistically significant. Conversely, weak significant relationship was found in the earlier study of (Yuliani, 2016)

Similarly, in task engagement, where learners manage and understand the given reading task, self-efficacy plays an important role. It accentuates students’ reading performance and accomplishment. (Apriliyani *et al.*, 2023). Firm belief in one’s abilities equips students with the confidence needed to accomplish a difficult task with ease (Lestari *et al.*, 2020).

Even though the recognised importance of self-efficacy in educational settings, few studies have been conducted on the present problem. There is a notable gap in empirical research specifically examining its impact on reading abilities among secondary school students in the context of India, particularly in the framework of educational entities within the region of West Bengal. The researcher aims to fill this gap by exploring A. Bandura’s (1986) social cognitive theory component, self-efficacy on reading in academic settings. These findings explain that students’ confidence in their ability to read impacts various academic outcomes in school.

## NEED FOR THE STUDY

The outcomes of this study are anticipated to offer meaningful

interpretations into how self-efficacy relates to reading ability. These findings can help to shape effective strategies aimed at improving academic performance in general and reading capabilities in specific among secondary school students. This research underscores the necessity for educators to implement strategies that cultivate self-efficacy, thereby enhancing students' reading abilities and promoting equitable academic outcomes.

### STATEMENT OF THE PROBLEM

The present problem was stated as "Empowering Readers: The Impact of Self-efficacy on Reading Ability of Secondary School Students.

### Operational Definition

- **Self-efficacy** is having confidence in one's ability to achieve a goal. Here, it means self-confidence, efficacy expectation, positive attitude, and outcome expectation.
- **Reading ability** here refers to the performance in the silent reading ability test (SRAT), consisting of subtests of the reading comprehension skills stated by Yang-Heim, G.Y. (2023). These skills are retrieving directly stated information, interpreting explicit information, interpreting by making inferences and reflecting on text.
- **Secondary school students** here refer to the students studying Grade 9 in government-aided schools.

### RESEARCH OBJECTIVE

To study the influence of self-efficacy on secondary school students reading ability.

### RESEARCH HYPOTHESES

H<sup>0</sup>: There is no significant impact of self-efficacy on secondary school students' reading ability.

### DELIMITATION OF THE STUDY

Data was collected from secondary school students in four districts of West Bengal, focusing solely on government-aided institutions.

### METHODOLOGY

#### Design

The design of the study was a descriptive survey method, employing quantitative techniques to analyse the data collected from the participants.

#### Population

The population consisted of secondary school students enrolled in government-aided institutions across four districts in West Bengal.

#### Sample

Government-aided secondary school students ( $N=501$ ) were selected using a stratified random sampling technique, ensuring representation across different demographics and academic performance levels.

### Research Tools

The tools used for data collection

- Self-efficacy Scale (SES) developed by Singh and Narain (2005).

- Silent Reading Ability test (SRAT) developed by the researcher and the supervisor

## DATA COLLECTION

The self-efficacy is a Likert-type scale having five response options such as strongly agree, agree, neutral, disagree and strongly disagree. For the evaluation of silent reading, a reading comprehension test (SRAT) was developed for ninth graders. The test consisted of multiple-choice question was to measure the reading comprehension skills stated by Yang-Heim, G.Y. (2023). These skills are retrieving directly stated information, interpreting explicit information, interpreting by making inferences and reflecting on text. In order to evaluate their reading comprehension abilities, a passage was chosen from the English textbook endorsed by the West Bengal Board of Secondary Education, which had been thoroughly reviewed in the classroom. An unfamiliar passage was extracted from the esteemed literary work *wise and otherwise*, authored by Sudha Murty. To assess the oral reading proficiency, the methodology proposed by Yang-Heim, G. Y. (2023, ch-4.2.1.2) was implemented. Thus, reading ability comprises of silent reading ability test and oral reading (fluency). The methodology emphasises the importance of evaluating both silent and oral reading fluency, which are critical components in assessing the overall reading ability in students.

## Result

The analysis will involve statistical techniques to evaluate the data collected, focusing on the impact on the reading ability of the participants. The investigator employed Excel and SPSS version 22 for the purpose of conducting data analysis.

## Score Transformation

The scales of measurement used are self-efficacy and reading ability. They are likely to have different units, and as we know, the scales of measurement must be comparable. The scores on these scales make different sets of distributions. Thus, these distributions are converted into a common distribution in order to make a common or comparable scale for making relative comparisons. The raw scores were converted into some common or standard scores. In this process, firstly, the raw scores are converted into z-scores by using the formula, but these standard scores have certain limitations. To overcome such limitations, T-scores are used by using the formula (Mangal, 2017).

## Self-efficacy of Secondary School Students

Table 1 shows that the mean score of self-efficacy of the government school ( $N=501$ ) is 49.188, and the SD is 10.157. The minimum T-score started from 23.09 and reached 75.01 (maximum). The median of the distribution is 49.0478. Skewness is 0.045, which is close to 0, and

**Table 1**  
**Descriptive Statistics of Self-efficacy of Secondary School Students**

| Scale                                   | N                                    | Mean   | Std. Deviation              | Std. Error Mean | Skewness             | Std. Error of Skewness | Kurtosis     | Std. Error of Kurtosis |
|-----------------------------------------|--------------------------------------|--------|-----------------------------|-----------------|----------------------|------------------------|--------------|------------------------|
| Self-efficacy (T-Score)                 | 501                                  | 49.188 | 10.157                      | 0.453           | -0.045               | 0.109                  | -0.391       | 0.218                  |
| <b>Level of Self-efficacy (T-Score)</b> |                                      |        |                             |                 |                      |                        |              |                        |
|                                         | <b>Low (<math>\leq 40.00</math>)</b> |        | <b>Medium (40.01–60.00)</b> |                 | <b>High (60.01+)</b> |                        | <b>Total</b> |                        |
| <b>Count</b>                            | 98                                   |        | 331                         |                 | 72                   |                        | 501          |                        |
| <b>%</b>                                | 19.6%                                |        | 66.1%                       |                 | 14.4%                |                        | 100.0%       |                        |

the distribution can be called nearly symmetric. The kurtosis value is 0.391, which depicts that the distribution is approximately normal (mesokurtic).

The classification of students' self-efficacy levels was done based on T-scores by using the mean  $\pm$  1 standard deviation (SD) method. This approach categorised the whole group of individuals into three categories, namely low, medium, and high. The low self-efficacy group has T-scores  $\leq 40.00$ , the medium has T-scores between 40.01 and 60.00, and the high has T-scores  $\geq 60.01$ . Further, it is observed that the percentage of low self-efficacious students is 19.6 per cent, medium efficacious students is 66.1 per cent, and high efficacious students is 14.4 per cent.

The analysis indicates that a significant portion of students exhibit medium self-efficacy levels, which may influence their reading performance and overall academic outcomes.

### **Reading Ability of Secondary School Students**

Table 2 shows that the mean score of reading ability of the secondary school students (N=501) is 48.0585, and the SD is 7.67204. The minimum T-score started from 28.22 and reached 68.88 (maximum). Skewness is 0.197 which is slightly left-skewed: which is close to 0, and the distribution can be called nearly symmetric. The kurtosis value is 0.516; a negative kurtosis indicates a platykurtic distribution, which depicts that the distribution is approximately normal.

The classification of students' reading ability levels was done based on T-scores by using the mean  $\pm$  1 standard deviation (SD) method. This approach categorised the whole group of individuals into three categories, namely low, medium, and high. The low Reading Ability group has T-scores  $\leq 41.87$ , medium has T-scores between 41.88 and 58.13, and high has T-scores  $\geq 58.14$ .

**Table 2**  
**Descriptive Statistics of Reading Ability of Secondary School Students**

| Scale                     | N   | Mean    | Std. Deviation | Std. Error Mean | Skewness | Std. Error of Skewness | Kurtosis | Std. Error of Kurtosis |
|---------------------------|-----|---------|----------------|-----------------|----------|------------------------|----------|------------------------|
| Reading Ability (T-Score) | 501 | 48.0585 | 7.67204        | 0.34276         | -0.197   | 0.109                  | -0.516   | 0.218                  |

|       | Level of Reading Ability (T-Score) |                      |               | Total  |
|-------|------------------------------------|----------------------|---------------|--------|
|       | Low (<=41.87)                      | Medium (41.88-58.13) | High (58.14+) |        |
| Count | 111                                | 345                  | 45            | 501    |
| %     | 22.2%                              | 68.9%                | 9.0%          | 100.0% |

In secondary school students, the percentage of students with low reading ability is 22.2 per cent, students with medium reading ability are 68.9 per cent, and students with high reading ability is 9.0 per cent.

**HYPOTHESES TESTING**

**Objective**

To study the impact of self-efficacy on secondary school students reading ability.

**H<sub>0</sub>:** There is no significant impact of self-efficacy on secondary school students reading ability.

**Interpretation**

In the Regression Summary Model, in Table 3, R square is found to be 0.015, which shows that the model self-efficacy explains only 1.5 per cent of the variance of reading ability. For the test of statistical significance of the result, the linear regression ANOVA summary is

**Table 3**  
**Regression Model Summary of the Score of Reading Ability of Secondary School Students**

| Model Summary                                                |                    |          |                   |                            |               |
|--------------------------------------------------------------|--------------------|----------|-------------------|----------------------------|---------------|
| Model                                                        | R                  | R Square | Adjusted R-Square | Std. Error of the Estimate | Durbin-Watson |
| 1                                                            | 0.123 <sup>b</sup> | 0.015    | 0.013             | 7.62093                    | 0.162         |
| <sup>a</sup> Predictors: (Constant), Self-efficacy (T-Score) |                    |          |                   |                            |               |
| <sup>b</sup> Dependent Variable: Reading Ability (T-Score)   |                    |          |                   |                            |               |

**Table 4**  
**Linear Regression ANOVA**

| <b>Model</b>                                                 |            | <b>Sum of Squares</b> | <b>Df</b> | <b>Mean Square</b> | <b>F</b> | <b>Sig.</b> |
|--------------------------------------------------------------|------------|-----------------------|-----------|--------------------|----------|-------------|
| 1                                                            | Regression | 448.838               | 1         | 448.838            | 7.728    | 0.006c      |
|                                                              | Residual   | 28981.231             | 499       | 58.079             |          |             |
|                                                              | Total      | 29430.069             | 500       |                    |          |             |
| <sup>a</sup> Dependent Variable: Reading Ability (T-Score)   |            |                       |           |                    |          |             |
| <sup>b</sup> Predictors: (Constant), Self-Efficacy (T-Score) |            |                       |           |                    |          |             |

**Table 5**  
**Regression Coefficient**

| <b>Coefficients</b>                           |                         |                                    |                   |                                  |          |             |
|-----------------------------------------------|-------------------------|------------------------------------|-------------------|----------------------------------|----------|-------------|
| <b>Model</b>                                  |                         | <b>Unstandardised Coefficients</b> |                   | <b>Standardised Coefficients</b> | <b>t</b> | <b>Sig.</b> |
|                                               |                         | <b>B</b>                           | <b>Std. Error</b> | <b>Beta</b>                      |          |             |
| 1                                             | (Constant)              | 43.470                             | 1.685             |                                  | 25.796   | 0.000       |
|                                               | Self-efficacy (T-Score) | 0.093                              | 0.034             | 0.123                            | 2.780    | 0.006       |
| Dependent Variable: Reading Ability (T-Score) |                         |                                    |                   |                                  |          |             |

shown in Table 4. The analysis of the result of linear regression for the prediction of reading ability from the scores of self-efficacy is found to be significant,  $F(1, 499) = 7.728$ ,  $p < 0.05$ . The contribution of self-efficacy is presented in Table 5, and this model can be used for the prediction of Reading Ability.

As indicated in Table 5, it is observed that according to the statistics provided, there is no problem of collinearity as the

tolerance and VIF were found to range much above 0.01 and much below 10, respectively. Table 5 identified self-efficacy as the dependent variable (reading ability). As the column of unstandardised coefficients is measured with T scores only, Table 5 indicates the independent variable self-efficacy ( $B = 0.093$ ,  $t = 2.780$ ,  $p < 0.05$ ) was found to have made a positively significant impact on the dependent variable reading ability.

### Regression Equation

As for linear regression, the coefficients in Table 5 provide the essential values for the prediction equation.

$$y = a + bx$$

$$y = 43.470 + 0.093 * \text{Self-efficacy (T-Score)}.$$

where  $y$  = Reading Ability (dependent variable)

$a$  = constant, 43.470

$b$  = the slope for (regression coefficient)

$x$  = Self-efficacy

Hence, the regression equation is as follows

### Unstandardised Regression Equation

$$\text{Reading Ability (y)} = 43.470 + 0.093 * \text{Self-Efficacy (T-Score)}.$$

Standardised Regression Equation

$$\text{Reading Ability (y)} = 43.470 + 0.123 * \text{Self-Efficacy (T-Score)}.$$

### FINDINGS AND DISCUSSION

On the basis of the results of descriptive analysis, the students who got a high level of self-efficacy were 72 (14.4%), a medium level of self-efficacy 331(66.1%) and a low level of self-efficacy 98(19.6%). It showed that a significant portion of secondary school students have a medium level.

Descriptive analysis delineates that 45 (9.0%) students got high level reading ability, medium level of reading ability 345 (68.9%) and low level of reading ability shown by 111 (22.2%).

### Impact of Self-efficacy on Reading Ability

Results of inferential statistics suggest that even a modest increase in self-efficacy can enhance the reading ability of secondary school students. The regression analysis,  $F(1, 499) = 7.728$ ,  $p < 0.05$ , indicates that self-efficacy has a statistically significant effect on reading ability, suggesting that interventions may improve students' performance in reading. Results show a significant positive relationship; high self-efficacy can lead to better reading in secondary school students. Self-efficacy influenced reading ability among students, as evidenced by previous studies (Habibian and Roslan, 2014; Boakye, 2015; Begum and Hamzah, 2018). When students possess high Self-Efficacy, then score in reading are also high implies self-efficacy and reading scores are directly related. If self-efficacy is increased, then scores in reading comprehension are also high. In determining the students' success in reading comprehension, not exclusively self-efficacy but also the educational environment and teaching methodologies employed. For instance, teachers who provide constructive feedback and create a supportive atmosphere can significantly boost students' confidence and overall performance (Anggriawan *et al.*, 2023).

### CONCLUSION

In conclusion, findings emphasise the self-efficacy role in shaping reading ability, suggesting that helping students having belief in their ability can lead to stronger academic

performance and better educational outcomes. Integrating technology-enhanced interventions can empower learners to improve their vocabulary and reading comprehension skills. To support all learners and ensure equitable access to literacy, it is essential to develop educational strategies that are inclusive and targeted. By combining strategies to strengthen self-efficacy with targeted allocation of resources, educators can create a more inclusive educational system that empowers every student to succeed in their literacy journey.

## RECOMMENDATIONS

- **Diverse learning materials:** Teachers should allow the learners to read diverse reading materials.
- **Tailored approaches for differential need:** Reading comprehension skills development, teachers play a pivotal role by assisting in developing confidence and aims successful reading outcomes by selecting appropriate strategies, reading material and providing enough time to read (Setiorini *et al.*, 2022)
- **Positive Reinforcement:** Teachers who had higher self-efficacy were more likely to have a positive classroom environment, support students' ideas, encouraging them to develop a positive mindset towards their reading capabilities (Schunk, 1991, cited by Maheshwari, 2022).
- **Use of Educational Technology:** Use of digital platforms, e-books, online quizzes, and gamified applications, which provide immediate feedback along with interactive learning experiences, can offer learners skill development at different levels (Smith, *et al.*, 2021). By integrating self-efficacy theory with educational technology, teachers can design differentiated instruction for learners of varying levels that fosters confidence, motivation, and measurable improvements in reading ability.
- **Professional Development:** There is a need to focus on professional development programmes of educators, which equip their skill acquisition as well as train them to foster learners' self-efficacy and motivate them to apply new strategies in the classroom.
- **Future Research:** Future research can be conducted on factors which may affect students' self-efficacy and reading ability in other disciplines.

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# Web-based Life Skills Instructional and Assessment Framework for Secondary School Students in Kerala

BINDU T.V.\* AND A.R. SARAVANAKUMAR\*\*

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## Abstract

*Life skills education plays a pivotal role in promoting the psychological and social well-being of adolescents. The existing instructional and assessment tools often lack contextual relevance and technological adaptability for regional educational settings. This paper presents the development and implementation of a Web-based Life Skills Instructional and Assessment System (WLSIAS) tailored for secondary school students in Kerala. A WLSIAS conceptualised on the World Health Organization's ten core life skills following a pilot psychometric evaluation involving 200 Class IX students from Secondary Schools in Kasaragod District, Kerala, with dual operational modes - Admin Mode for content management, data export, and statistical analysis; and Student Mode for interactive training and pre-test, post-test for skill acquisition and retention. It is powered by a structured SQLite database and a Python Flask framework, integrating automated quiz generation, multimedia-based learning modules, and application of t-tests, Wilcoxon signed-rank tests, and Friedman ANOVA. The system autonomously generates performance charts and report documents to visualise improvement patterns across life skills dimensions. Experimental deployment demonstrated significant post-training improvement and measurable skill retention, validating the tool's potential as a scalable digital intervention framework for regional life skills education. The designed WLSIAS thus bridges the gap between psychometric rigour and digital pedagogy, contributing a replicable model for life skills education in secondary schools.*

**Keywords:** Life Skills Education, Web-based Learning System, Instructional Framework, WHO Core Life Skills Assessment

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## INTRODUCTION

The National Education Policy (NEP, 2020: p. 5, 12) of India observed that imparting life skills to school students is instrumental for creating holistic and well-rounded individuals for the nation. Life skills are developed as a result of a constructive processing of information, impressions, encounters and experiences—both individual and social—that are a part of one's daily life and work, and the rapid changes that occur in the course of one's life (Singh, 2003). The WHO (1994, 1997) defined life skills as, “abilities for adaptive and positive behaviour that enables individuals to deal effectively with the demands and challenges of everyday life” by specifying ten core-skills—self-awareness, empathy, critical thinking, creative thinking, decision making, problem solving, effective communication, interpersonal relationship skills, coping with stress, and coping with emotions. Life skills are a range of psychosocial and cognitive abilities that help children to make informed decisions and choices, manage their emotional well-being, and communicate effectively (Singh and Menon, 2016). UNICEF (2019) has defined life skills as, “a behaviour change or behaviour development approach designed to address a balance of three areas—knowledge, attitudes, and skills.”

The WHO (1994) explains self-awareness is recognition of ourselves, our character, our strengths and weaknesses, and desires and dislikes;

empathy is the ability to imagine what life is like for another person, even in a situation that we may not be familiar with; critical thinking is an ability to analyse information and experiences in an objective manner; creative thinking contributes to both decision making and problem solving by enabling us to explore the available alternatives and various consequences of our actions or non-action; decision making is dealing constructively with decisions about our lives; problem solving is dealing constructively with problems in our lives; effective communication is expressing ourselves, both verbally and non-verbally, in ways that are appropriate to our cultures and situations; interpersonal relationship skills is relating us in positive ways with the people we interact with; coping with stress is about recognising the sources of stress in our lives, recognising how this affects us, and acting in ways that help to control our levels of stress; and coping with emotions involves recognising emotions in ourselves and others, being aware of how emotions influence behaviour, and being able to respond to emotions appropriately. Further, WHO paired these ten skills into five main life skills areas—decision making and problem solving, creative thinking and critical thinking, communication and interpersonal relationships, self-awareness and empathy, and coping with emotions and stressors (Singh and Menon, 2016).

Globally and in India, life skills education has been connected with improvements in psycho-social outcomes, reductions in depression and anxiety symptomatology, gains in self-efficacy, and school engagement with multiple delivery mechanisms such as out-of-school programmes and well-structured school-based formal programmes (Singh and Menon, 2016). Prajapati *et al.* (2017) argue that life skills education not only bridges the gap between the basic functioning and capabilities, but also strengthens the ability of individuals to meet the needs and demands of the present society and helps them in dealing with the above issues in a manner, to get the desired behaviour practically. Sherif *et al.* (2023) observed that life skills education is helpful for preventive measures, promoting healthy positive behaviour, and strengthening communication and socialisation skills. In India, the CBSE (2005) introduced life skills education as an integral part of the curricula through continuous and comprehensive evaluation for students from Grades 6 to 10. Recent systematic and empirical studies indicate that both face-to-face, and digitally mediated life skills intervention programmes can positively affect adolescents' mental health and socio-emotional functioning, particularly when the interventions are theory-driven, culturally adapted, and include active learning components (Sherif *et al.*, 2023; Fernández-Batanero *et al.*, 2025).

Despite the established theoretical value of life skills education, there are different approaches followed to deliver life skills education in formal school settings as a stand-alone subject, or integrated curriculum, and measurement of immediate-term, short-term, and long-term outcomes from life skills education. Even though measurement tools such as self-rating scales, teacher-rating reports, and behavioural measure activities are widely used to assess the outcomes of the life skills education, they are not consistent and comparable (Singh and Menon, 2016). Furthermore, the psychometric instruments and training materials developed in one cultural context often perform poorly when transported without adaptation, yielding questionable construct validity and measurement equivalence (that is, items may not map onto local expressions of behaviour or reasoning), and resource constraints and variable teacher training can limit reliability of programme delivery, reducing the consistency of learning experiences of students across schools are the evident limitations and challenges in life skills education outcomes measurement mechanisms. These problems motivated the researchers to think about context-sensitive tools that combine validated measurement with accessible delivery modalities, for example, web-based instructional packages that embed multimedia content, automated assessments, and analytics for monitoring implementation fidelity.

The UNICEF (2019, p. 36) also emphasises providing access to life skills development programmes and delivering them in a safe and secure school environment and platforms.

It is also noted that digital life skills interventions are increasingly prominent in the literature because they promise standardisation, reach, and enhanced engagement of students through multimedia content, and interactive and personalised learning (Arkan and Bal, 2025). The randomised and quasi-experimental protocols of online life skills education programmes have begun to show effectiveness in improving coping, reducing psychological distress, and strengthening specific competencies when programmes are designed to be developmentally appropriate and culturally relevant (Sherif *et al.*, 2024; Fernández-Batanero *et al.*, 2025). Importantly, online programmes additionally permit automated data capture that facilitates psychometric evaluation (item functioning, reliability) and longitudinal tracking (pre-test → post-test → retention test), enabling both programme refinement and research-quality inference.

In India, and specifically in Kerala, educational stakeholders have prioritised socio-emotional learning and life skills education within school health initiatives, but rigorous and regionally validated digital tools to implement and assess the life skills education in secondary school settings remain scarce. Local adaptation matters, such as curricular examples, role-play

prompts, and assessment items, should reflect students' cultural idioms and school-life realities to maximise face and content validity. Studies in India have reported positive impacts of structured life skills training on depression, anxiety, stress, and social competence. However, many of these studies used a paper-based or teacher-led implementations with limited digital integration, and few studies reported detailed psychometric quality of the assessment instruments used (Ramakrishnan and Sylvia, 2024). This gap creates an opportunity for a web-based, psychometrically defensible system design, specifically for Kerala's secondary school context. Therefore, this paper aims to address this gap by describing the development, deployment, and initial validation of a Web-based Life Skills Instructional and Assessment System (WLSIAS) tailored for Grade 9 students of secondary schools in Kerala. The system is based on the WHO's ten-core life skills framework and iteratively designed after a pilot psychometric evaluation with 200 students of Grade 9 to ensure contextual relevance and acceptable measurement properties. WLSIAS integrates adaptive content management (admin-uploadable lesson documents and multimedia for each WHO-specified life skills domain); automated quiz generation and secure storage of pre-test, post-test, and retention-test scores; and built-in statistical analysis (paired t-tests, Wilcoxon signed-rank tests, Friedman ANOVA); and visualisations,

to summarise changes at both the skill-specific and overall levels. The WLSIAS thus combines educational delivery with real-time experience, and an evidence-generation tool, suitable for both practitioners and researchers.

This paper mainly focuses on the design and implementation of WLSIAS, describing system architecture, module composition, and workflow for admin and student modes. It reports psychometric and outcome evidence from the pilot deployment (N = 200), examining reliability, construct coherence, and pre-post-retention changes across the ten-core WHO life skills domain. It further illustrates how the embedded statistical routines and automated reporting support the classroom-level decision-making and programme refinement. The discussion situates empirical findings within existing evidence for life skills interventions and digital tools, and identifies practical considerations for scale-up in Kerala and comparable educational settings in India. Practically, combining culturally adapted instructional content, validated assessment instruments, and an accessible web-based delivery model, WLSIAS aims to bridge the long-standing divide between psychometric rigour and scalable pedagogy. The system's pilot results and implementation lessons, provide a replicable template for integrating life skills education, into school curriculum and leveraging digital platforms for rigorous programme implementation and evaluation.

## LITERATURE REVIEW

The Assam Life Skills Framework (2023) broadly categorises the life skills into emotional skills, cognitive skills, and social skills. Further, it explains that life skills education helps adolescents in promoting the positive and healthy behaviours, healthy decision-making and sociability; improving communication abilities; enhancing self-management abilities, and emotion management abilities; and increasing self-esteem.

Yadav and Iqbal (2009) argued that imparting life skills education has a positive outcome when taught as a part of the curriculum in schools. The study carried out in Kerala by Suresh and Subramonian (2015) points out that life skills education is more focused on the development of arithmetic, writing, and reading skills in the majority of the schools. Albertyn *et al.* (2001) believed that life skills training enhances the critical thinking abilities, and further, it impacts living life actively, being responsible in the job and in future planning too.

Smith *et al.* (2006) noted that life skills education has created significant improvement in interpersonal relationships and a reduction in aggression and behavioural problems. The investigation of Tuttle *et al.* (2006) shows the extraordinary capability of teens to promote positive outcomes and flexibility due to the life skills training.

Vranda and Rao. (2011) proved that life skills training enhanced students' psycho-social competencies. Puspakumara (2011) in his study showed that life skills training was effective in preventing a wide range of problems such as substance abuse, teenage pregnancies, violence, bullying, and promotes self-confidence and self-esteem among the adolescents. Roodbari, Sahdipoor, and Ghale's (2013) research showed that life skills training has a positive effect and improves social development, and emotional and social adjustment among students.

Bandela and Chandrasekhar (2013) recommend life skills education for capacity building of a person, developing resiliency skills and preventing taking risks. Kumar *et al.* (2022) experimental study on the effectiveness of life skills training on academic performance among adolescents in Kollam, Kerala shows a positive impact in improving the academic performance of students. Annapurna and Lakshmi (2023) noted that life skills education is able to meet the changing needs of the professional, social, cultural, and economic life of humans, which demands an education that develops a complete personality, focusing on academic achievement.

Choudry and Bakshi (2024) found the dynamic interplay between education, life skills, and academic achievement in fostering well-rounded individuals. Kavitha *et al.* (2024) found a significant positive correlation between the level

of life skills and academic performance among nursing students in Thrissur. Verma (2024) observed that life skills education not only bridges the gap between basic functions and capabilities but also strengthens the individual's ability to meet the needs of the current society and helps in addressing the above issues. Halder (2024) suggests life skills education for the development of higher-order cognitive skills, as well as the socio-emotional competencies and character building among students.

A women's organisation in Kerala called 'Sakhi' works with young people, and the interventions have varied from its inception in 1998. The organisation offers life skills programmes to enhance the life skills of adolescent girls in the age group of 12-14, called "Adolescent Life Skill Education Programme (in Malayalam it is known as 'Viriyunna Mukulungal')." By 2015, it was able to enhance the life skills of 8322 young children from 71 panchayats of 12 districts of Kerala. A life skills programme known as 'Ullasapparavakal' was implemented by the SCERT (2018) of Kerala in selected 93 schools, during the academic year 2016-17, as a responsibility to children, and it was found that the life skills programme is beneficial for promoting a healthy attitude toward life among students.

Anand (2024) lists different kinds of training design models to provide life skills education to school students, to create a learning environment that directly addresses their specific needs

and difficulties faced by the teachers in classroom transaction of life skills curriculum, that includes the ADDIE Model, Successive Approximation Model, Bloom's Taxonomy Model, Kirkpatrick's Model, and Gagne's Nine Events Model. Further, it is suggested that a technology-enabled training design model in life skills training, as technology is revolutionising training delivery, making it more economical, flexible, and customised. Also, it is easy to reach out to the learners, possible to modify the content according to the needs and demands of the learners, and provides a consistent personalised learning experience to every learner. Over the past five years, there has been a notable shift toward integrating life skills within school health programmes while leveraging digital modalities to increase reach and standardise delivery (Singla *et al.*, 2020; Wani *et al.*, 2024).

The literature review identifies three broad streams relevant to designing and evaluating a regionally tailored, web-based life skills instructional and assessment system—core evidence for life skills programmes in low- and middle-income countries, psychometric and measurement concerns for life skills assessment, and promise and pitfalls of digital delivery and retention assessment.

Structured life skills curricula can reduce risky behaviours, improve psychosocial outcomes, and strengthen decision-making capabilities when implemented with

fidelity and contextual adaptation (Singla *et al.*, 2020). These syntheses emphasise core implementation ingredients of active learning, teacher facilitation, and community engagement while also noting heterogeneity in outcomes due to differences in delivery, dosage, and contextual stressors. More recent field trials in South Asia and Africa have extended these findings by testing shorter, modular programmes and after-school delivery formats, showing promise especially when local stakeholders shape content and examples (Ravindranath *et al.*, 2024). Collectively, this work argues that context-specific curricular examples and culturally aligned scenarios are necessary to realise reliable gains in adolescent competencies.

The psychometric quality of life-skills measurement remains central to credible programme evaluation. Studies deploying life skills instruments in diverse settings, often report variability in internal consistency, factor structure, and item performance, underscoring the need for pilot testing, item revision, and local validation (Singla *et al.*, 2020). A recent study emphasises the use of repeated measures designs (pre-post-retention tests) to evaluate both immediate learning and medium-term retention, and advocates for paired statistical tests alongside non-parametric alternatives where distributional assumptions are violated (Taylor *et al.*, 2024). Embedding psychometrically sound brief scales reduces measurement

error and enables meaningful interpretation of changes across the ten-core WHO-specified life skill domains, which is especially important when interventions are short and sample sizes in pilots are modest.

Digital and hybrid delivery platforms have gained traction as vehicles for life skills education because of their potential for scalability, standardisation, and data capture. Randomised trials of adolescent digital mental health and life-skills interventions report significant but modest effects on stress, rumination, and loneliness, with higher benefits for engaged users and for programmes that combine multimedia content with interactive tasks (Boucher *et al.*, 2024; Taylor *et al.*, 2024). Scoping and systematic reviews of digital mental health interventions for adolescents highlight that while digital mental health interventions can broaden reach, they are not a panacea, but engagement, equity of access, and the need for pedagogically sound content remain critical concerns (Wani *et al.*, 2024; Potts *et al.*, 2025). Program developers are therefore encouraged to integrate design features that enhance motivation (short modules, multimedia, quizzes) and to provide dashboards and exportable reports that support teacher-led follow-up.

Retention assessment is a practical dimension that has received comparatively less attention in school-based life skills education literature, though analogous research

in educational and skills training domains indicates that retention is influenced by opportunities for practice and reinforcement (Landman *et al.*, 2023). Short retention intervals are a reasonable starting point in pilot research to detect early decay in knowledge or application, and to inform whether booster activities are needed. For school systems, the feasibility of retention testing relies on minimal disruption to the class schedules and simple logistics and hence the appeal of web-based systems that can automate scheduling and scoring.

Implementation science considerations underscore that digital life skills platforms must be context-sensitive to allow administrators upload local-language lesson files, provide culturally resonant examples, and role-play activities, and to produce easy-to-interpret statistical summaries for teachers and policymakers (Taylor *et al.*, 2024; Zimmermann *et al.*, 2024).

Literature review also highlighted that automated analytics facilitate iterative item refinement, by flagging items with poor discrimination or differential functioning across subgroups and thereby improving the psychometric robustness of scales over time. Taken together, these strands justify the present study's combination of local psychometric piloting with 200 Grade 10 students, an administratively controlled content management system to ensure cultural fit, and automated analytics to support continuous measurement

improvement and evidence-based decision making.

## **METHODOLOGY**

This paper presents the development of a Web-based Life Skills Instructional and Assessment System (WLSIAS), a comprehensive digital platform designed to train and evaluate the life skills of secondary school students in Kerala. The system is built on the WHO-specified ten-core life skills framework: self-awareness, empathy, critical thinking, creative thinking, decision making, problem solving, communication, interpersonal skills, coping with stress, and coping with emotions. This digital platform integrates instructional delivery, adaptive assessment, and psychometric data analysis into a single, interactive environment.

The WLSIAS platform was developed using the Python Flask microframework on two user modes: Student Mode and Administrator Mode, each serving a distinct pedagogical or administrative role. The system employs a client-server architecture with a lightweight SQLite backend for data persistence, and a JSON-based content repository to store skill-specific lessons, multimedia materials, and quiz question banks. It enforces a structured pedagogical flow through three assessment phases: pre-test, post-test, and retention-test, thereby quantifying both skill acquisition and retention. The following subsections detail the complete

implementation and workflow of the system, beginning with the student-oriented components, followed by the administrative and analytical subsystems.

## **SYSTEM ARCHITECTURE**

The overall architecture of the WLSIAS is organised under four functional layers. The Presentation Layer encompasses all visual and interactive interfaces for students and administrators. It supports user authentication, navigation, and content rendering, providing an intuitive and responsive environment for accessing lessons and assessments. The Application Logic Layer governs the system's operational flow, including routing, access control, content management, quiz generation, scoring mechanisms, and statistical evaluation. It serves as the central control unit that coordinates communication between the interface and the data components. The Data Layer manages structured storage of user profiles, assessment scores, and analytical outcomes through a relational database system. Complementing this, a structured content repository maintains metadata for each life skill, encompassing learning objectives, textual lessons, multimedia resources, and question banks. The Storage and Media Layer handles persistent storage of educational documents, audio-visual learning materials, statistical reports, and visual analytics outputs. During

system initialisation, necessary data structures and directories are automatically verified to ensure operational integrity. The modular representation of skill data allows new life skill domains to be integrated or existing ones to be modified seamlessly without necessitating changes to the underlying database or programme logic. This flexible design supports the continuous evolution of the instructional package as educational requirements expand. Fig. 1 depicts the architectural design of the WLSIAS framework, and the corresponding homepage interface is shown in Fig. 2.

Student Mode

The Student Mode of WLSIAS is dedicated to learners’ engagement and assessment. It provides an adaptive environment where students can register and access life skills modules,

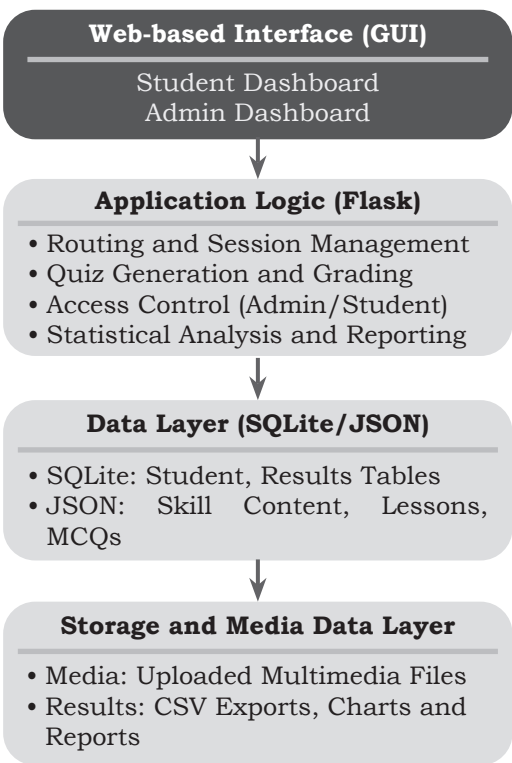


Fig. 1: Overall architecture of the WLSIAS framework

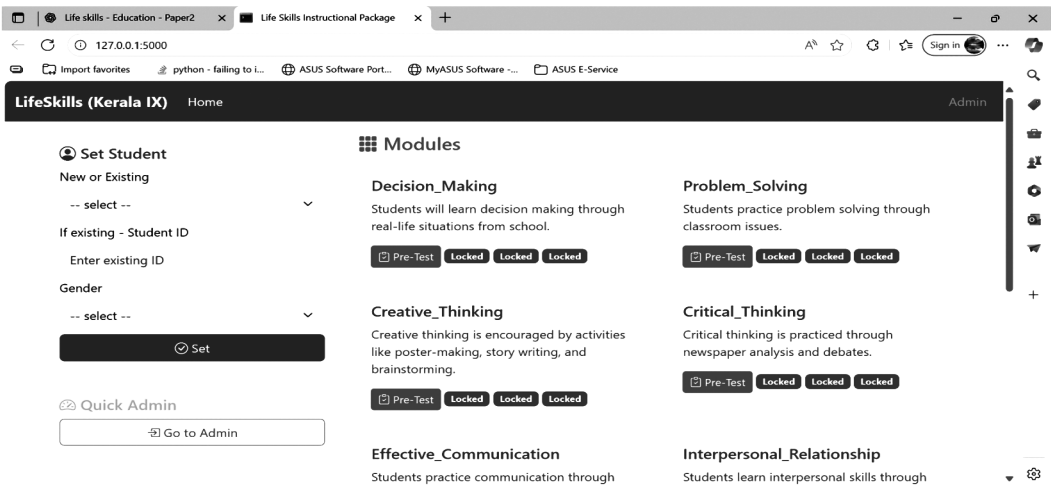


Fig. 2: Homepage interface of the WLSIAS framework

complete assessments, and review their performance progress. The system enforces a structured learning cycle—Pre-test → Intervention → Post-test → Retention-test, that aligns with outcome-based education principles and supports both self-assessment and guided improvement.

**Student Identification and Session Management**

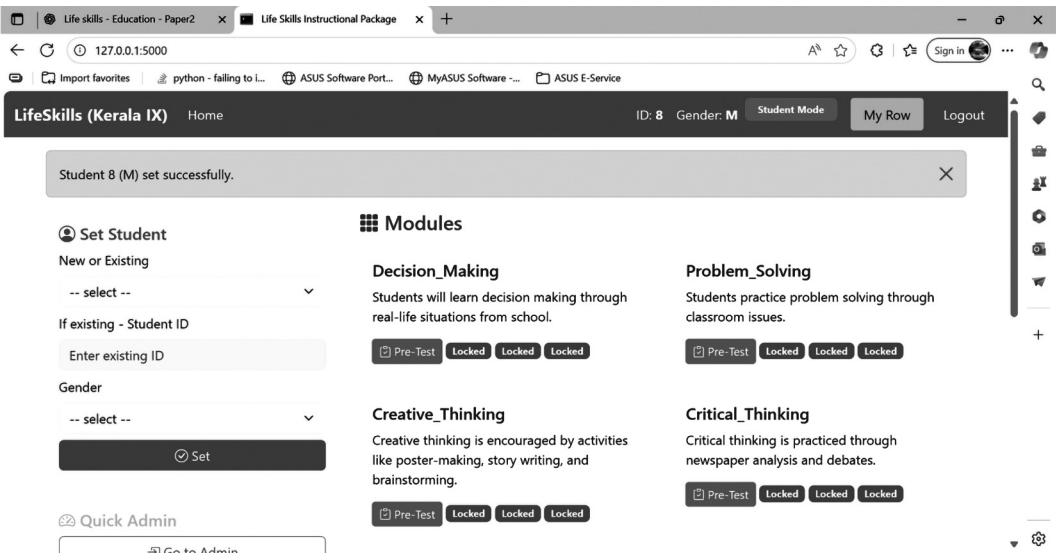
Fig. 3 indicates the student registration process, which enables each learner to create a unique profile within the system. Basic demographic information, like gender, is collected to support later analytical stratification and comparative performance studies. Once registered, the system securely maintains the student's identity through session management mechanisms, that track login states, test attempts, and performance history.

This structure ensures data isolation and individual accountability while providing continuity across multiple learning sessions. Each student's learning journey is thus securely tied to their personal profile and supports accurate longitudinal evaluation.

**Module Access and Instructional Flow**

Each module within the system represents one of the WHO-specified life skills domains. The learner interface provides access to all available modules. However, entry into each module follows a pedagogically enforced sequence. The learner must first complete the pre-test to establish a baseline measure before accessing the instructional materials.

After the pre-test, the system grants access to the associated



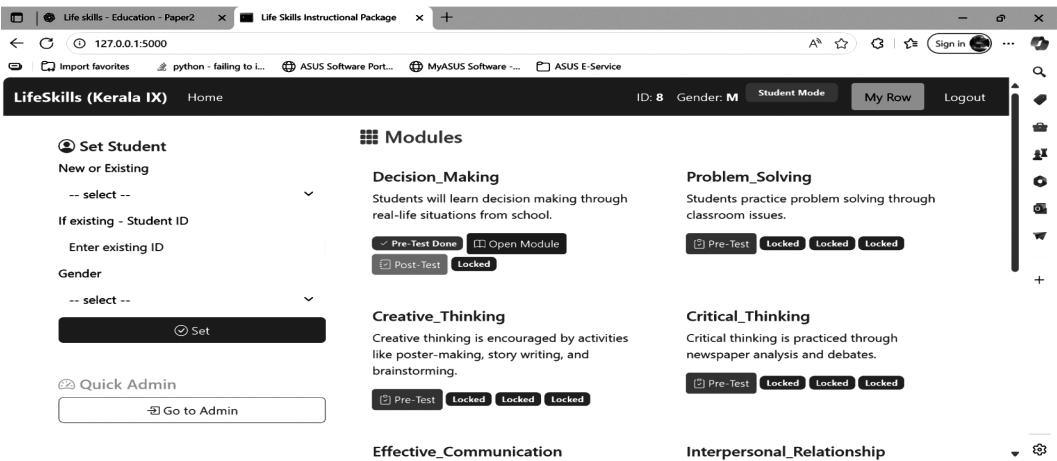
*Fig. 3: Student dashboard interface following successful login*

learning materials, which may include text-based lessons, interactive exercises, and multimedia content, such as images, audio narratives, and video demonstrations. This multimodal approach supports diverse learning styles and promotes higher engagement of students. Upon completion of the learning

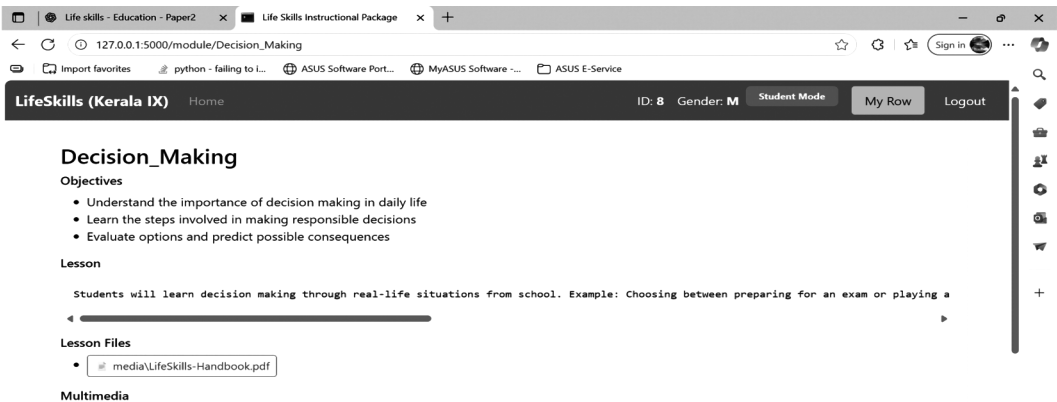
phase, students are directed to the post-test stage, to evaluate learning progress. The retention-test phase, conducted after a defined time interval, examines the sustainability of the learning outcomes.

**Quiz Generation and Presentation**

The assessment component of each module is based on dynamically



*Fig. 4: Access to learning materials after completing the pre-test for the Decision Making module*



*Fig. 5: Learning materials with lesson files and multimedia content for the Decision Making module*

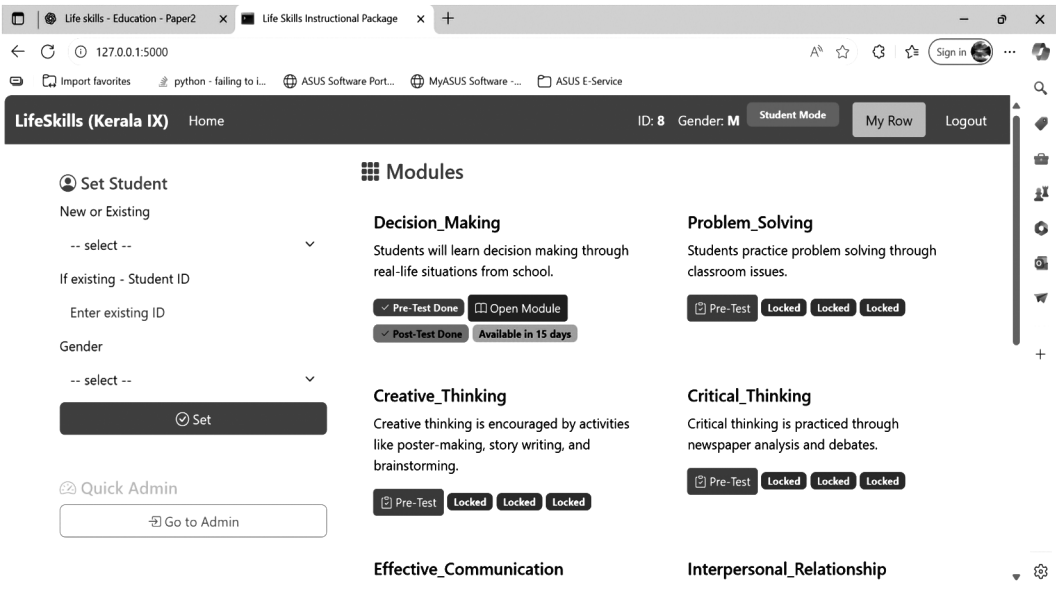


Fig. 6: Countdown initiation for the retention-test after completing the post-test in the decision-making module

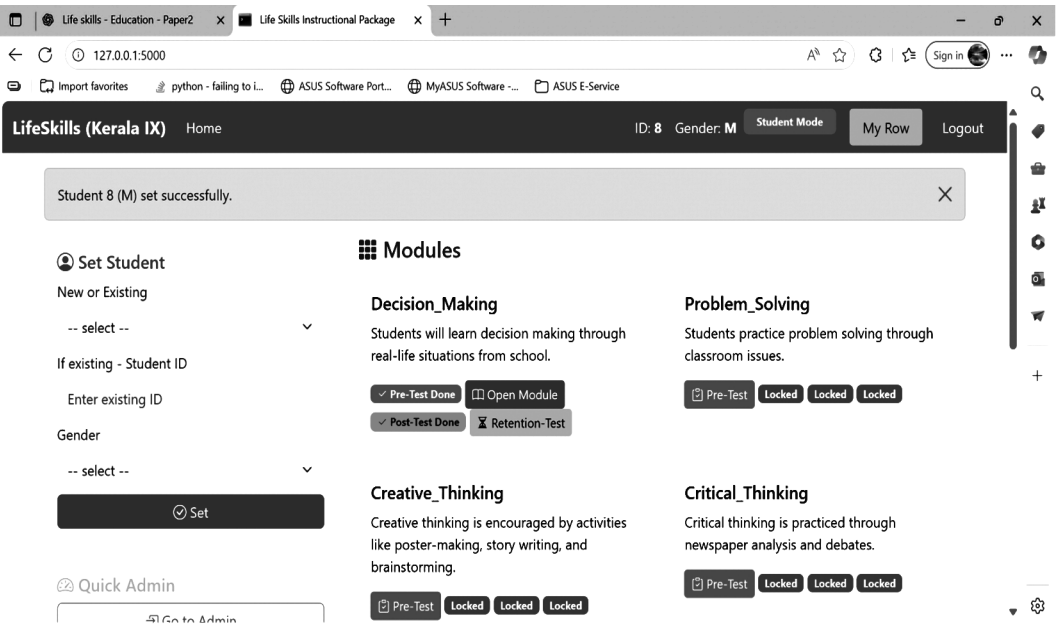


Fig. 7: Retention-test enabled after countdown completion for the decision-making module

generated multiple-choice questions derived from the corresponding question bank. For each test instance, a balanced set of questions is selected randomly to ensure variation and minimise recall bias. Each question includes multiple options with a single correct response, and the system records both the questions served and the responses submitted by the respondents to maintain the integrity of the evaluation.

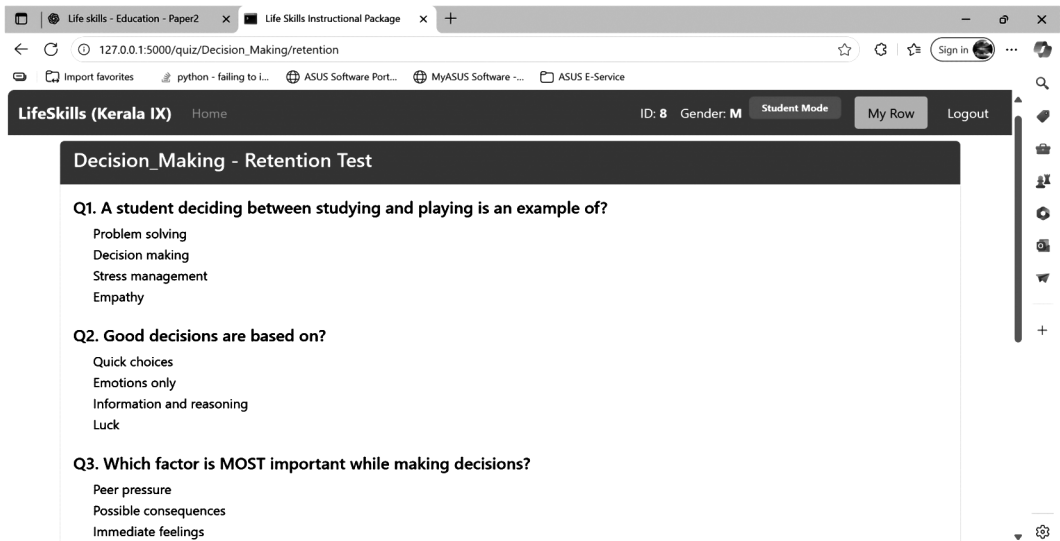
This automated generation mechanism ensures consistent test difficulty across users and supports repeated administration without compromising assessment fairness.

### **Quiz Grading and Result Persistence**

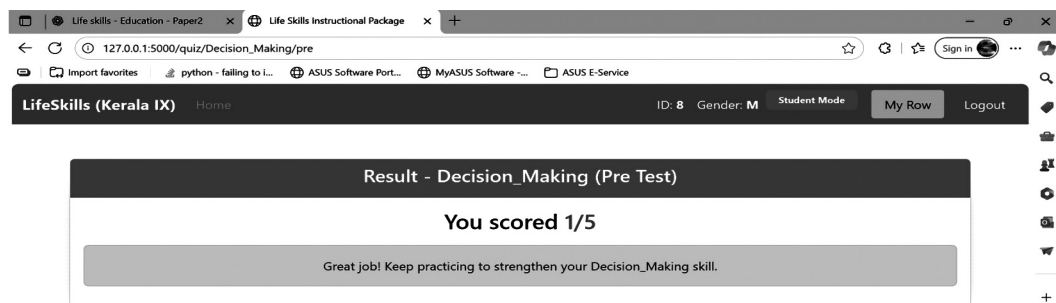
Once the learner submits the assessment, the system automatically evaluates the responses and computes the corresponding score. It records

the results across all test phases—pre-test, post-test, and retention-test, enabling both skill-specific and overall performance tracking. To ensure measurement reliability, the system continuously maintains cumulative statistics, including mean and aggregated performance indices. In the post-test stage, the completion timestamp is logged to regulate eligibility for the retention test, which can only be attempted after a specified time interval of 15 days.

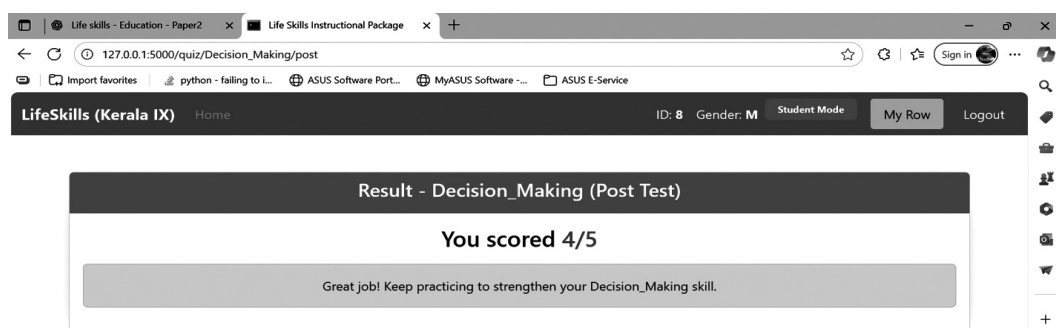
The platform provides real-time feedback to learners. If the performance in the post-test does not surpass the pre-test score, the system generates targeted feedback encouraging revision of relevant materials. Similarly, retention feedback is offered to reinforce sustained understanding and long-term application of learned skills.



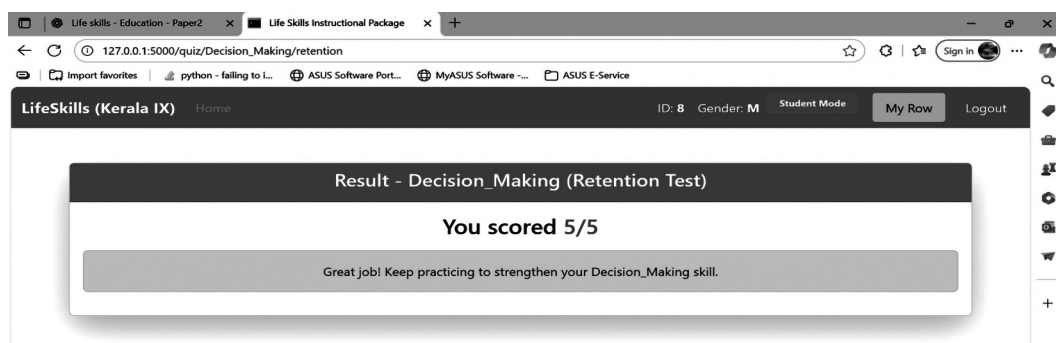
*Fig. 8: Dynamically generated multiple-choice assessment for each life skill module*



*Fig. 9: Score and real-time feedback to the students after completing the pre-test*



*Fig. 10: Score and real-time feedback to the students after completing the post-test*



*Fig. 11: Score and real-time feedback to the students after completing the retention-test*

### **Data Visualisation and Review**

A dedicated performance dashboard enables students to view the detailed summaries of their results, encompassing both skill-wise and aggregate scores. This visual feedback

allows students to identify their strengths and weaknesses across life skill areas and supports reflective learning. The design encourages self-directed improvement and fosters intrinsic motivation for skill mastery.

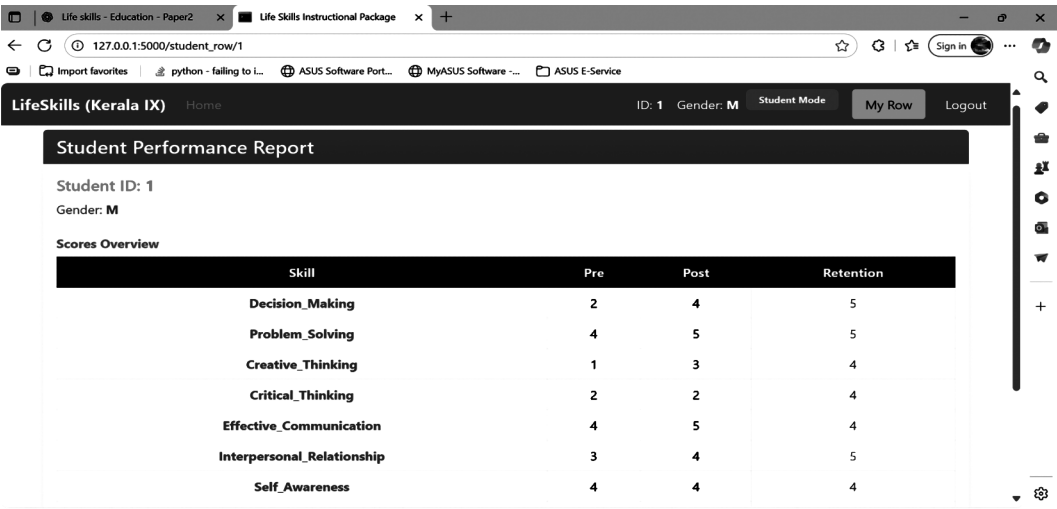


Fig. 12: Student performance report displaying skill-wise and aggregate scores

### ADMIN MODE

The Admin Mode provides educators, researchers, and programme administrators with tools for content management, learner monitoring, data analysis, and report generation. It functions as the supervisory and analytical control centre of the WLSIAS platform.

### Authentication and Role Control

Admin access is restricted through password authentication to ensure that only authorised personnel can manage instructional and assessment data. Once validated, the system grants access privileges associated with administrative functions, including editing modules, uploading

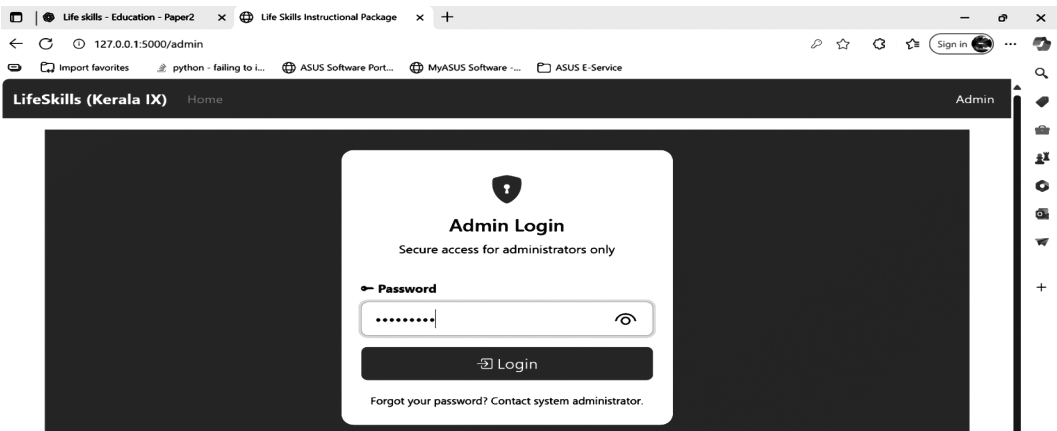


Fig. 13: Admin login authentication

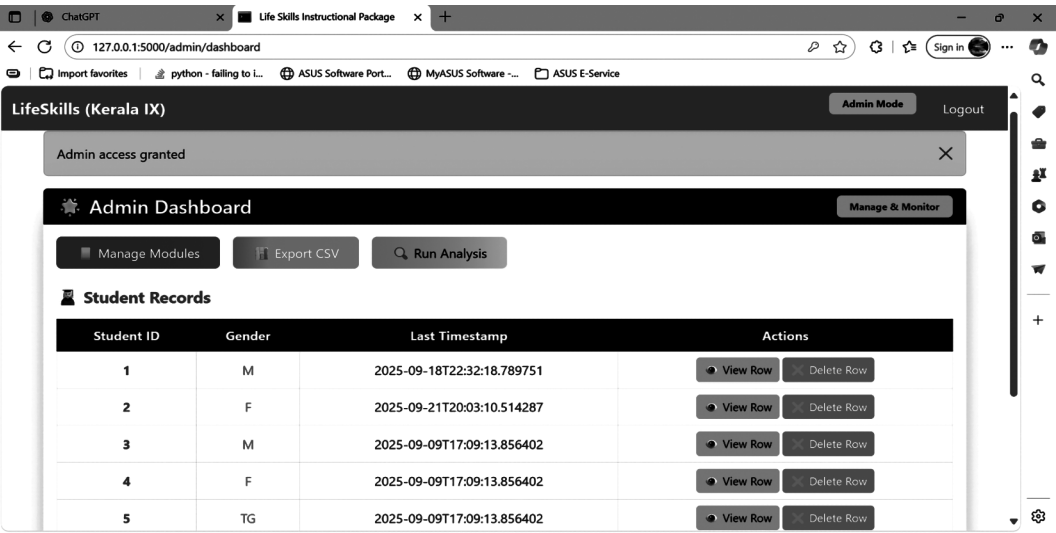


Fig. 14: Admin dashboard interface following successful login

materials, and conducting statistical evaluations. For production-grade deployments, the architecture supports integration of encrypted credentials and multi-level access control policies to enhance data security and accountability.

**Content Management and Media Uploads**

The content management subsystem enables admins to upload, organise, and maintain instructional materials corresponding to each life skill module. Supported formats

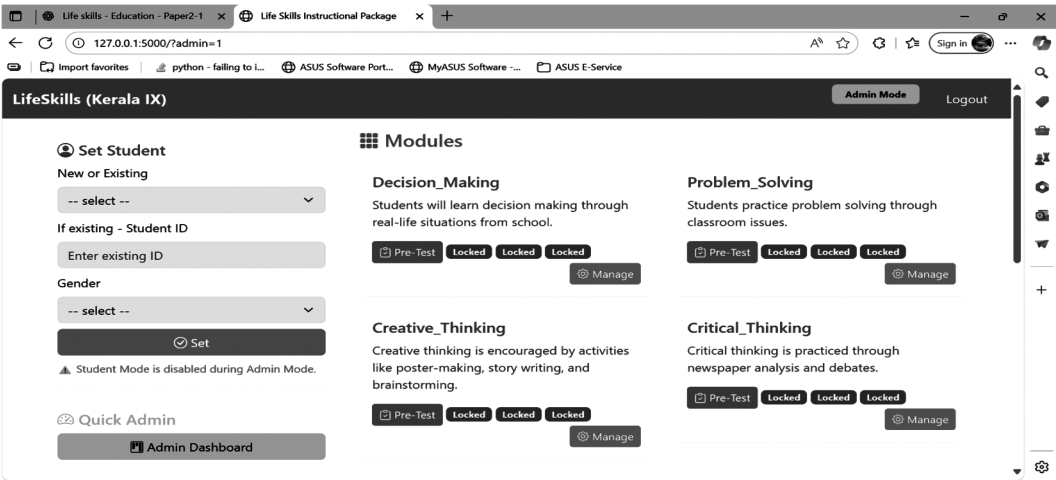
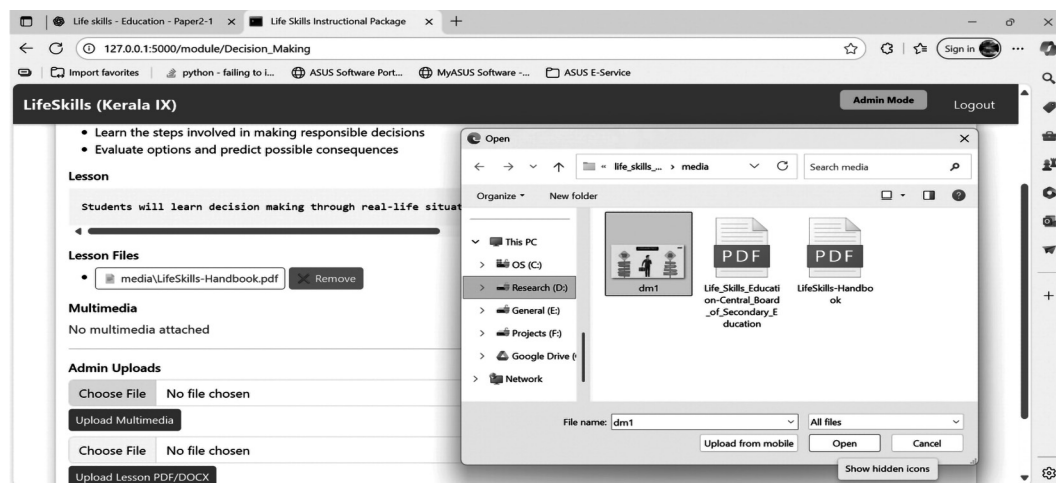
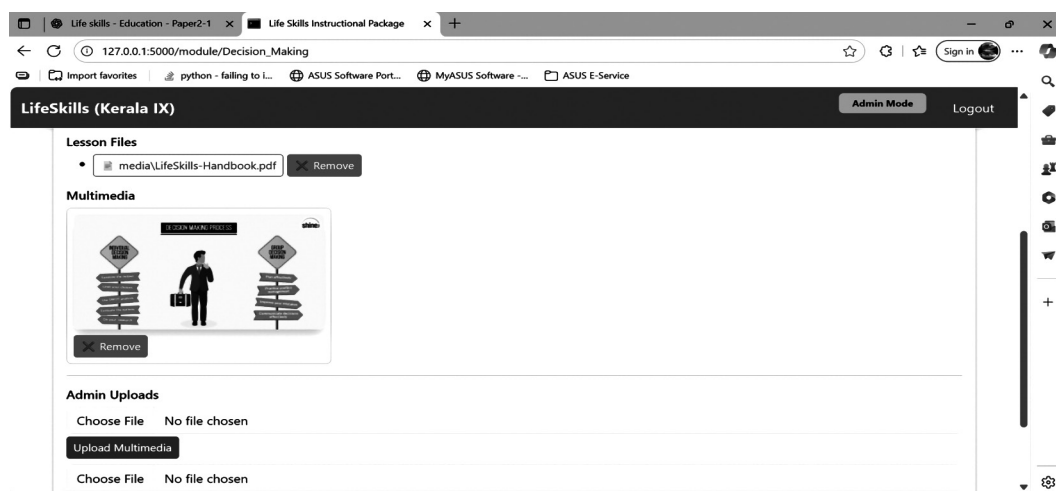


Fig. 15: Content management for each life-skill module enables handling of the contents



*Fig. 16: Selection and uploading of multimedia images and materials for decision-making module*



*Fig. 17: Uploaded contents of the decision-making module, such as lesson files and multimedia images*

include text documents, slides, and multimedia assets. Each uploaded item is categorised automatically based on its format and linked to the appropriate skill domain within the repository. The modular content structure allows continuous

enhancement of materials and contextual adaptation for different learner populations. Admin may modify, replace, or remove content at any time to ensure training materials remain current and pedagogically aligned.

Data Management

The admin dashboard presents comprehensive student records, including demographic details, progress metrics, and test completion history. Admin can filter, review, or remove student records when required, maintaining

compliance with privacy regulations. An integrated export feature allows the admin to generate data files summarising learners’ results for external analysis or institutional reporting. These exports include individual and aggregated statistics, supporting evidence-based decision-making and programme evaluation.

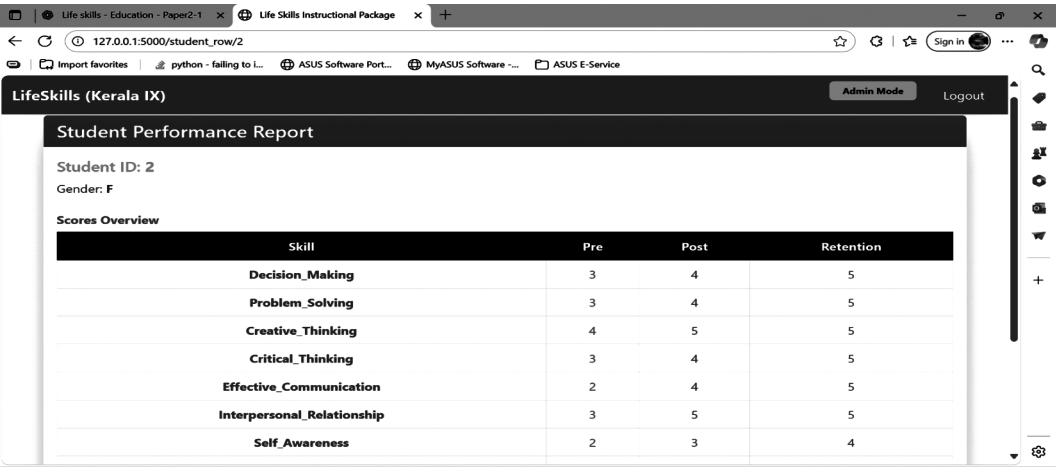


Fig. 18: Student’s performance report (admin mode)

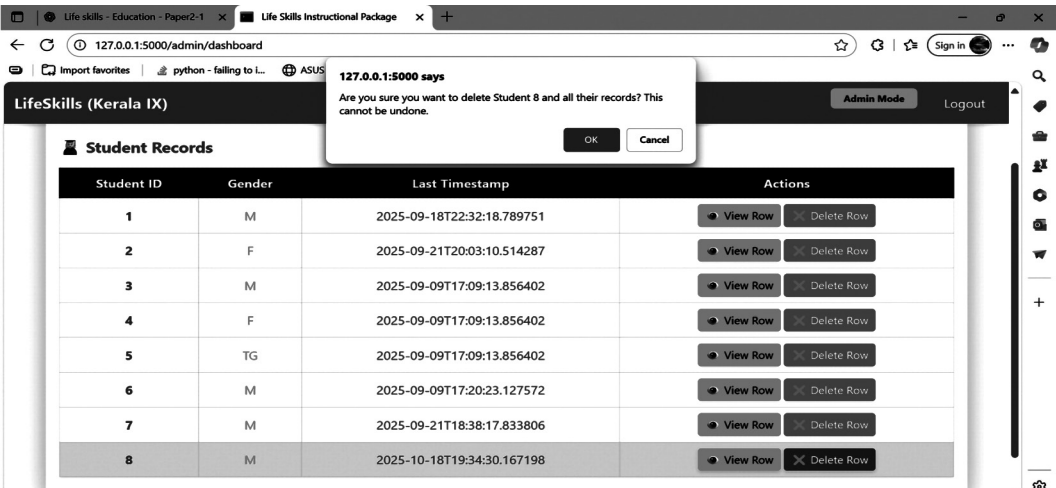


Fig. 19: Remove the student’s record if the admin decides that it is not required

The screenshot shows the 'LifeSkills (Kerala IX)' Admin Mode dashboard. At the top, there are tabs for 'Manage Modules', 'Export CSV', and 'Run Analysis'. Below these is a section titled 'Student Records' containing a table with the following data:

| Student ID | Gender | Last Timestamp             | Actions                                               |
|------------|--------|----------------------------|-------------------------------------------------------|
| 1          | M      | 2025-09-18T22:32:18.789751 | <button>View Row</button> <button>Delete Row</button> |
| 2          | F      | 2025-09-21T20:03:10.514287 | <button>View Row</button> <button>Delete Row</button> |
| 3          | M      | 2025-09-09T17:09:13.856402 | <button>View Row</button> <button>Delete Row</button> |
| 4          | F      | 2025-09-09T17:09:13.856402 | <button>View Row</button> <button>Delete Row</button> |
| 5          | TG     | 2025-09-09T17:09:13.856402 | <button>View Row</button> <button>Delete Row</button> |
| 6          | M      | 2025-09-09T17:20:23.127572 | <button>View Row</button> <button>Delete Row</button> |
| 7          | M      | 2025-09-21T18:38:17.833806 | <button>View Row</button> <button>Delete Row</button> |

Fig. 20: Sample updated students' details (admin dashboard)

The screenshot shows an Excel spreadsheet titled 'ppr\_results\_gui\_export - Excel (Product Activation Failed)'. The spreadsheet contains a table with the following data:

| student_id | gender | Decision_1 | Decision_2 | Decision_3 | Problem_1 | Problem_2 | Problem_3 | Creative_1 | Creative_2 | Creative_3 | Critical_1 | Critical_2 | Critical_3 | Effective_1 | Effective_2 | Effective_3 | Interpers_1 | Interpers_2 | Interpers_3 |
|------------|--------|------------|------------|------------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1          | F      | 1          | 3          | 4          | 2         | 4         | 5         | 2          | 4          | 5          | 2          | 3          | 4          | 2           | 3           | 4           | 1           | 3           | 4           |
| 2          | TG     | 1          | 3          | 4          | 1         | 2         | 3         | 1          | 2          | 3          | 1          | 3          | 4          | 2           | 3           | 4           | 1           | 2           | 3           |
| 3          | M      | 2          | 4          | 5          | 1         | 3         | 4         | 2          | 3          | 4          | 1          | 3          | 4          | 1           | 2           | 3           | 2           | 3           | 4           |
| 4          | F      | 1          | 2          | 3          | 2         | 4         | 5         | 2          | 3          | 4          | 1          | 2          | 3          | 1           | 2           | 3           | 2           | 3           | 4           |
| 5          | M      | 1          | 2          | 3          | 2         | 4         | 5         | 2          | 3          | 4          | 1          | 2          | 3          | 2           | 4           | 5           | 2           | 4           | 3           |
| 6          | M      | 1          | 3          | 4          | 1         | 3         | 4         | 2          | 3          | 4          | 1          | 2          | 3          | 2           | 4           | 5           | 2           | 4           | 3           |
| 7          | F      | 2          | 3          | 4          | 1         | 2         | 3         | 2          | 3          | 4          | 1          | 3          | 4          | 1           | 3           | 4           | 1           | 3           | 4           |
| 8          | F      | 1          | 2          | 3          | 2         | 3         | 4         | 2          | 4          | 5          | 1          | 3          | 4          | 2           | 4           | 5           | 2           | 3           | 4           |
| 9          | M      | 1          | 3          | 4          | 1         | 2         | 3         | 2          | 4          | 5          | 1          | 2          | 3          | 2           | 3           | 4           | 1           | 3           | 4           |
| 10         | F      | 2          | 3          | 4          | 2         | 3         | 4         | 1          | 3          | 4          | 1          | 2          | 3          | 2           | 3           | 4           | 2           | 3           | 4           |
| 11         | TG     | 1          | 3          | 4          | 2         | 4         | 5         | 2          | 4          | 5          | 1          | 3          | 4          | 1           | 2           | 3           | 2           | 4           | 3           |
| 12         | F      | 2          | 3          | 4          | 1         | 3         | 4         | 2          | 4          | 5          | 1          | 3          | 4          | 1           | 2           | 3           | 1           | 2           | 4           |
| 13         | F      | 2          | 4          | 5          | 2         | 3         | 4         | 1          | 2          | 3          | 2          | 4          | 5          | 2           | 3           | 4           | 1           | 3           | 4           |
| 14         | M      | 2          | 3          | 4          | 1         | 2         | 3         | 2          | 3          | 4          | 1          | 2          | 3          | 1           | 3           | 4           | 1           | 2           | 3           |
| 15         | TG     | 1          | 3          | 4          | 1         | 3         | 4         | 2          | 4          | 5          | 2          | 4          | 5          | 2           | 3           | 4           | 2           | 3           | 4           |
| 16         | TG     | 1          | 3          | 4          | 1         | 3         | 4         | 1          | 3          | 4          | 1          | 2          | 3          | 2           | 3           | 4           | 1           | 3           | 4           |
| 17         | M      | 1          | 2          | 3          | 1         | 2         | 3         | 1          | 3          | 4          | 2          | 3          | 4          | 1           | 2           | 3           | 2           | 3           | 4           |
| 18         | M      | 2          | 3          | 4          | 1         | 3         | 4         | 2          | 4          | 5          | 1          | 2          | 3          | 2           | 3           | 4           | 2           | 4           | 3           |
| 19         | F      | 2          | 3          | 4          | 2         | 3         | 4         | 1          | 2          | 3          | 1          | 2          | 3          | 2           | 4           | 5           | 1           | 3           | 4           |
| 20         | M      | 2          | 3          | 4          | 1         | 2         | 3         | 2          | 3          | 4          | 1          | 2          | 3          | 2           | 3           | 4           | 2           | 4           | 3           |
| 21         | F      | 2          | 4          | 5          | 1         | 2         | 3         | 1          | 3          | 4          | 2          | 4          | 5          | 2           | 4           | 5           | 1           | 3           | 4           |

Fig. 21: Database export to CSV for external analysis

Statistical Analysis

A significant key feature of the WLSIAS platform lies in its built-in analytics and automated reporting module. The system performs statistical comparisons across test phases to evaluate the effectiveness of life skills training. For each skill

domain, paired-sample t-tests and non-parametric alternatives (for example, Wilcoxon signed-rank tests) are used to measure learning gains between pre- and post-test phases, while repeated-measures analyses such as the Friedman test and ANOVA, evaluate longitudinal performance across all three phases.

Visual analytics are generated to illustrate mean performance trends and statistical significance levels across life skills. The system also produces comprehensive analytical summaries and formatted reports, containing tables and charts, for research dissemination and administrative review. These aspects are discussed in detail in the results and discussion section, along with the corresponding tables and charts.

### **DATABASE SCHEMA AND MIGRATION**

The database schema is designed for dynamic adaptability. During initialisation, the system verifies the existence of required data structures and extends them automatically when new skills are introduced. Columns representing each skill and corresponding test phase are created or updated as necessary, ensuring the backward compatibility and continuous data integrity. The modular schema and automated migration procedures reduce the need for manual database intervention, minimise human error, and promote scalability across multiple institutions.

### **RESULTS AND DISCUSSION**

In this study, the WLSIAS framework was experimentally evaluated with a cohort of 200 Grade 9 students from Secondary Schools in Kasaragod District, Kerala. The experimental procedure followed a structured three-phase evaluation sequence in accordance with the WHO's life

skills education model. Initially, each participant completed a pre-test to establish a baseline measure of knowledge and skill proficiency. Subsequently, students underwent a training phase using the system's interactive lesson materials and multimedia learning content specifically designed for each life skill. Following the completion of training, participants undertook a post-test to assess knowledge acquisition and skill enhancement.

After an interval of 15 days, a retention-test was administered to evaluate the sustainability of learning outcomes and to determine whether students effectively retained their acquired knowledge in each skill domain. The scores obtained across all three test phases were subjected to statistical evaluation using both the parametric and non-parametric methods, including paired-sample t-tests, Wilcoxon signed-rank tests, Friedman tests, and ANOVA to analyse longitudinal performance variations and validate the efficacy of the training.

The comparative results of the pre-test, post-test, and retention-test are summarised in Table 1, while their visual representations are shown in Fig. 22 and Fig. 23. The statistical analyses clearly reveal that the proposed system effectively enhances both immediate learning and long-term knowledge retention among secondary school students.

**Table 1**  
**Summary of Statistical Analysis Report for each Life Skill**

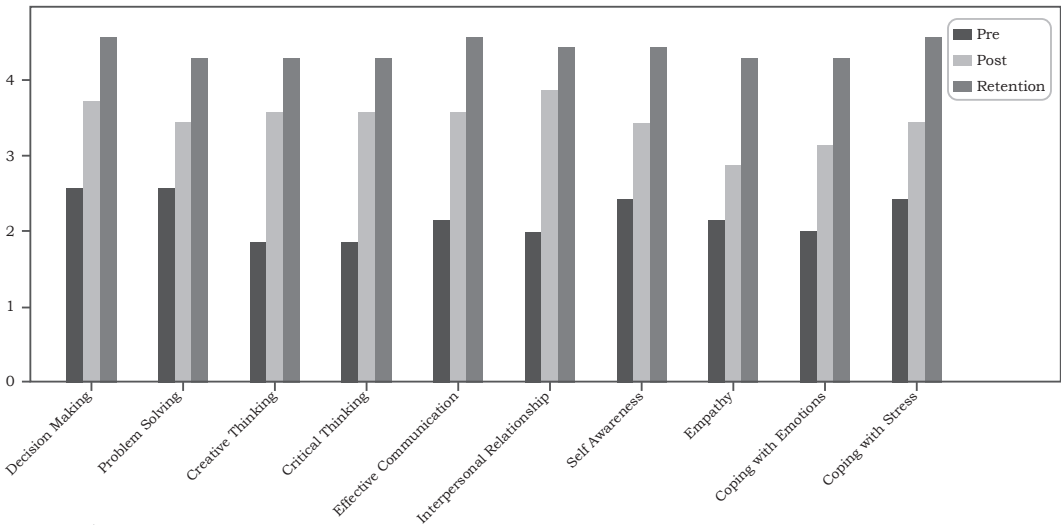
| <b>Skill</b>               | <b>Mean<br/>Pre-test</b> | <b>Mean<br/>Post-test</b> | <b>Mean<br/>Retention<br/>test</b> | <b>p-Value<br/>Pre-test</b> | <b>p-Value<br/>Post-test</b> | <b>Friedman<br/>Test<br/>p-Value</b> | <b>ANOVA<br/>p-Value</b> |
|----------------------------|--------------------------|---------------------------|------------------------------------|-----------------------------|------------------------------|--------------------------------------|--------------------------|
| Decision Making            | 2.571                    | 3.714                     | 4.571                              | 0.0047                      | 0.0453                       | 0.0060                               | 0.0002                   |
| Problem Solving            | 2.571                    | 3.429                     | 4.286                              | 0.0010                      | 0.0167                       | 0.0019                               | 0.0050                   |
| Creative Thinking          | 1.857                    | 3.571                     | 4.286                              | 0.0001                      | 0.0082                       | 0.0013                               | 0.0001                   |
| Critical Thinking          | 1.857                    | 3.286                     | 4.714                              | 0.0082                      | 0.0004                       | 0.0011                               | 0.0000                   |
| Effective Communication    | 2.143                    | 3.571                     | 4.571                              | 0.0004                      | 0.0382                       | 0.0043                               | 0.0006                   |
| Interpersonal Relationship | 2.000                    | 3.857                     | 4.429                              | 0.0000                      | 0.0300                       | 0.0015                               | 0.0000                   |
| Self-awareness             | 2.429                    | 3.429                     | 4.429                              | 0.0038                      | 0.0038                       | 0.0025                               | 0.0002                   |
| Empathy                    | 2.143                    | 2.857                     | 4.286                              | 0.0465                      | 0.0004                       | 0.0021                               | 0.0000                   |
| Coping with Emotions       | 2.000                    | 3.143                     | 4.286                              | 0.0300                      | 0.0002                       | 0.0015                               | 0.0000                   |
| Coping with Stress         | 2.429                    | 3.429                     | 4.571                              | 0.0038                      | 0.0047                       | 0.0015                               | 0.0001                   |

Across all life skill modules, a marked increase in mean scores was observed from the pre-test to post-test phase, indicating a strong positive impact of training through instructional materials and multimedia components. The paired-sample t-test and Wilcoxon signed-rank test results confirmed that these improvements were statistically significant ( $p < 0.05$ ) for all ten life skills. The Friedman test and ANOVA analyses further verified consistent longitudinal gains across the three assessment phases, substantiating the robustness of the training programme.

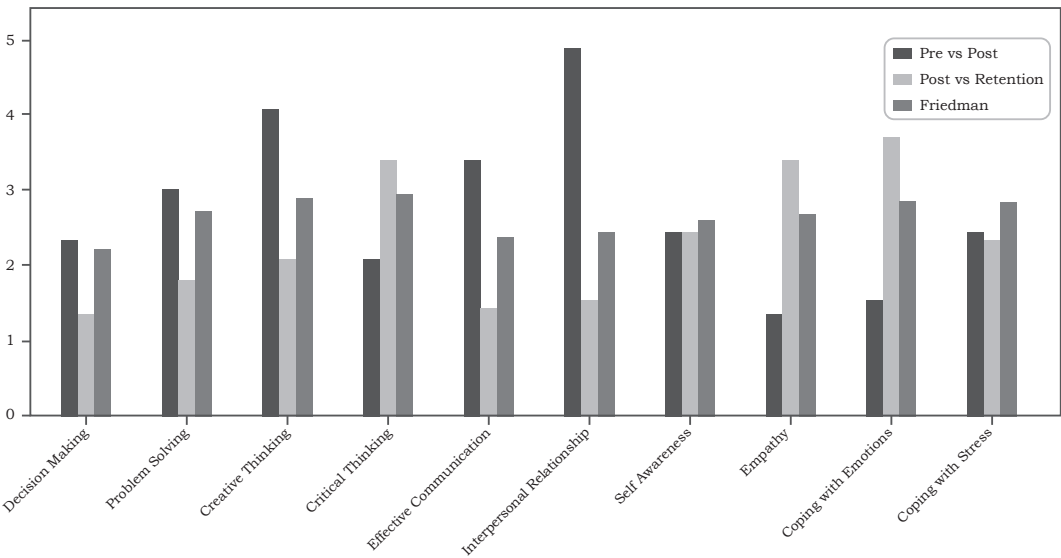
As illustrated in Fig. 22, the post-test scores exhibited an average improvement of 25–35 per cent over the baseline pre-test values across most skills, with the highest gains recorded in interpersonal relationships, decision making, critical thinking, and effective communication.

The retention-test scores, presented in Fig. 23, remained relatively stable with only a minor decline of 3–5 per cent compared to the post-test results, demonstrating effective knowledge retention after a 15-day time interval.

These outcomes validate the pedagogical efficacy of the WLSIAS



*Fig. 22: Comparison of pre-test and post-test mean scores across the ten-core WHO-specified life skill domains using the WLSIAS framework*



*Fig. 23: Comparative analysis of post-test and retention-test mean scores illustrating knowledge retention across the ten life skill domains*

framework and its ability to reinforce the sustained learning through structured, interactive, and contextually relevant content.

Furthermore, the integrated feedback mechanism within WLSIAS played a key role in reinforcing conceptual understanding by providing students

with a personalised performance summaries and targeted recommendations after each test phase. This formative feedback loop fostered self-reflection and facilitated improved performance in subsequent assessments. The statistically significant gains and stable retention outcomes collectively establish WLSIAS as a credible and scalable model for digital life skills training within secondary school environments.

## CONCLUSION

The present paper introduced and validated a Web-based Life Skills Instructional and Assessment System (WLSIAS) designed in alignment with the World Health Organization's ten-core life skills framework. The system was systematically developed to integrate digital pedagogy, adaptive assessment, and psychometric rigour within a unified technological environment. By incorporating structured pre-test, post-test, and retention-test phases, the WLSIAS framework provided a reliable mechanism for evaluating both the immediate learning gains and long-term knowledge retention among secondary school students. The experimental implementation involving 200 Grade 9 students from secondary schools in Kasaragod District, Kerala, demonstrated that this system significantly improved learners' conceptual understanding and application of life skills. The statistical results from paired-sample

t-tests, Wilcoxon signed-rank tests, Friedman tests, and ANOVA analyses confirmed that the post-training scores showed substantial enhancement over baseline performance, while retention outcomes indicated minimal decay after a 15-day time period. These findings collectively validate the pedagogical effectiveness and psychometric soundness of the WLSIAS framework for structured life skills training.

Beyond its educational utility, this system carries important societal implications. By fostering essential cognitive, emotional, and interpersonal competencies through a contextually adapted, digital learning ecosystem, WLSIAS contributes to building an emotionally resilient, socially responsible, and self-aware youth populations. The use of multimedia-assisted training and real-time feedback mechanisms further enhances learners' engagement and inclusivity, making it particularly suitable for large-scale adoption in school-based life skills training programmes. From a technological perspective, WLSIAS exemplifies an innovative model for digitally-enabled, data-driven life skills instruction. Its modular design, automated assessment pipeline, and integrated analytics establish a replicable blueprint for educational institutions seeking scalable and evidence-based interventions.

Looking ahead, future research will focus on expanding this system's capabilities through AI-driven adaptive

learning, multilingual content integration, and cross-cultural validation studies to generalise its applicability across different educational and socio-economic contexts. Further, embedding machine learning-based predictive analytics could enhance personalised training pathways and early identification of learners needing targeted interventions.

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