

A JOURNAL OF EDUCATION
(PEER-REVIEWED)

VOLUME 18
AUGUST 2026
ISSN: 0973-5895 (P)

ANWESA



RAMAKRISHNA MISSION
BRAHMANANDA COLLEGE OF EDUCATION

Rahara, Kolkata - 700 118
West Bengal, India

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Volume – 18, August – 2026
ISSN : 0973-5895 (P)

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A Journal of Education
(Peer-Reviewed)

Published by

The Secretary

Ramakrishna Mission Brahmananda College of Education
Rahara, Kolkata – 700 118
West Bengal, India

All correspondence should be addressed to :

The Principal

Ramakrishna Mission Brahmananda College of Education
Rahara, Kolkata – 700118
Email : rkmbcrahara@gmail.com
Phone: [033] 2568-2021

Price : 500/-

Printed by :

Perfect Services

5B, Anthony Bagan Lane

Kolkata - 700 009

Mob. : 98300 81089

Email : perfectservicespod@gmail.com

ANWESA

CONTENTS

Research Articles

INTEGRATING GENERATIVE AI IN CAMBODIAN HIGHER EDUCATION: CHALLENGES, OPPORTUNITIES, AND INTERNATIONAL LESSONS

Lay Sam Ean, Som Vuddneath & Lum Sothearak ■ 7

EXPLORING INDIAN KNOWLEDGE SYSTEM FROM THE PERSPECTIVES OF RAMAKRISHNA MATH AND RAMAKRISHNA MISSION

Swami Shrinamananda & Swami Tattwasarananda ■ 27

AVADHANA AS A FRAMEWORK FOR DEVELOPING ATTENTIONAL CONTROL IN EFL LISTENING

Hari Prasad Sapkota ■ 36

SOCIO-CULTURAL AND EDUCATIONAL SCENARIO OF LODHA PEOPLE AT BELPAHARI, JHARGRAM DISTRICT, WEST BENGAL

Bishnupada Nanda & Samir Chattopadhyay ■ 49

EFFECT OF OCCUPATIONAL STRESS ON JOB SATISFACTION IN HIGHER EDUCATION IN BANGLADESH: A CROSS-SECTIONAL STUDY

Shafika Afroz, Md. Imran Hossain, Nayan Chandra Saha & Tanvir Hassan ■ 55

A STUDY ON THE RELATIONSHIP BETWEEN RELIGIOSITY AND SCIENTIFIC ATTITUDE OF THE HIGHER SECONDARY SCHOOL STUDENTS IN KALIMPONG DISTRICT

Pinkey Manger, Anil Saren & Sumana Samanta Naskar ■ 67

REVIVING INDIGENOUS WISDOM THROUGH INDIAN KNOWLEDGE SYSTEM IN HIGHER EDUCATION

Pranay Pandey ■ 82

YOUNG LEARNERS' THEORY OF MIND (TOM) AND NARRATIVE RETELLING WITHIN MULTILINGUAL CONTEXT: SOME DISCUSSIONS ON THE CONCEPT, METHODOLOGY AND TASKS

Kankan Das & Anish Jackson N ■ 95

SRI AUROBINDO'S INTEGRAL EDUCATION: ITS RELEVANCE IN THE 21ST CENTURY

Sanjiban Sengupta ■ 116

ATTITUDE TOWARDS TRANSGENDER PEOPLE IN INDIA AND BANGLADESH: A COMPARATIVE STUDY

Juyel Ali ■ 123

ACHIEVEMENT MOTIVATION IN RELATION TO ACHIEVEMENT IN LIFE SCIENCE AT SECONDARY LEVEL

Swami Vidyamritananda & Biswajit Chatterjee ■ 142

YOGA EDUCATION RESEARCH IN THE ERA OF HOLISTIC LEARNING: A BIBLIOMETRIC ANALYSIS OF TRENDS, THEMES, AND COLLABORATION

Ratan Sarkar & Abhishek Das ■ 154

ROLE OF EDUCATION IN THE EMPOWERMENT OF TOTO TRIBAL WOMEN IN INDIA: PRISMA-BASED STUDY

Harun Al Rasid Mondal & Chandrakanta Jain ■ 176

EVALUATION OF TEACHING-LEARNING COMPETENCIES OF PRE-SERVICE TEACHERS DURING SCHOOL INTERNSHIP

Kartick Chandra Mandal, Gopa Saha Roy & Chandan Adhikary ■ 183

EXPECTATIONS, CHALLENGES, AND OPPORTUNITIES OF THE NATIONAL EDUCATION POLICY NEP 2020: A MIXED-METHOD STUDY ON UNDERGRADUATE AND POSTGRADUATE STUDENTS IN WEST BENGAL

Sreetanuka Nath & Samir Kumar Mahato ■ 193

INTERGENERATIONAL TRANSMISSION OF ETHNOMEDICINAL KNOWLEDGE AMONG TRIBAL COMMUNITIES: A LITERATURE REVIEW

Saswati Bandyopadhyay & Bishnupada Nanda ■ 206

ENHANCING EDUCATIONAL OUTCOMES THROUGH ARTIFICIAL INTELLIGENCE: A STUDY ON DEVELOPING TEACHING-LEARNING SKILLS

Partha Roy ■ 218

SECONDARY EDUCATION IN THE CONTEXT OF NEP 2020: A THEORETICAL PERSPECTIVE WITH SPECIAL REFERENCE TO GOVERNANCE AND ADMINISTRATION

Pijus Kanti Paira & Nizamuddin Ahmed ■ 230

WOMEN EMPOWERMENT THROUGH POLITICAL PARTICIPATION IN RURAL WEST BENGAL: DOES POLITICAL PARTICIPATION MAKE A DIFFERENCE?

Kanai Sarkar & Sanjib Kr. Roy ■ 240

ICT-INTEGRATED INQUIRY LEARNING IN HIGHER SECONDARY LEVEL GEOGRAPHY: AN EXPERIMENTAL STUDY

Divyadyuti Banerjee (Corresponding author), Swagat Ray & Anujit Patra ■ 255

BOOK REVIEW

POLITICS OF EDUCATION IN INDIA: A PERSPECTIVE FROM BELOW

Ramdas Rupavath & Sanjit Debnath ■ 268

FROM THE EDITOR'S DESK

Multilingualism, Language Teaching and NEP 2020

Multilingualism can be described as the ability to use (in written or spoken discourse) more than two languages by an individual or a group of speakers. India is one of the world's most linguistically diverse nations, where people from different sections of the society, caste and religion speak different languages. Therefore, India is a multilingual country and people speak several languages without any obstructions. P. B. Pandit rightly depicted India as a 'linguistic mosaic' and 'sociolinguistic giant'. Devi Prasanna Pattanayak in this respect argues "In multilingual countries many languages are facts of life; any restriction in the choice of language use is a nuisance, and one language is not only economic, it is absurd" (p. 82). Though National Curriculum Framework (NCF) 2005 argued that the linguistic and cultural diversity of India should be treated as a resource and it should be promoted judiciously in the classroom, many teachers still do not have the awareness on how to implement it in the classroom and many teachers still consider multilingualism as a threat in the classroom and they like to promote dominant languages only in the classroom (Bisai and Singh, 2020, Rao, 2017). As a result, most of the teachers ignore minority languages in the classroom. In recent time, National Education Policy 2020 (NEP 2020) has given much emphasis on Multilingualism and it describes multilingualism not merely as a linguistic phenomenon in a social situation, but cultural, pedagogical, cognitive and emotional phenomenon. This policy suggests that children should be taught in their mother tongues since it is the primary markers of their identity and children learn better in their mother tongue. Various researches of Western scholars (Garcia 2009, Glock et al. 2018) and scholars from Global South (Mohanty, 2009; Bisai and Singh, 2020; Bisai, 2026) have proved that students learn better in their mother tongue. When a teacher uses mother tongue in the classroom, students can comprehend the lesson easily, expresses their opinion in the classroom and it also promotes collaborative and cooperative thinking. Government of India has taken serious initiatives to implement NEP 2020 as early as possible and instructed competent authorities to integrate mother tongue education in every aspect of curriculum.

NEP 2020 posits multilingualism at the heart of educational reform in India by promoting home language instructions, flexible learning opportunities, culturally sensitive pedagogy, promotion and preservation of linguistic and cultural diversity, it seeks to improve the learning outcome of the students; at the same time it promotes social inclusion in the classroom. We can understand that the promotion of multilingualism will be difficult because teachers have to adopt the art of implementing multilingual pedagogy in the classroom, but the time is not too far to cope up with the multilingual pedagogy since it might bring linguistic equality in the classroom. In spite of these challenges, NEP 2020 has the potential to become a global model for promoting multilingual education in linguistically diverse societies.

For this issue, we have received more than eighty papers which **highlight** recent trends and opportunities of Indian as well as global education system. Out of them we have

chosen a number of articles in this issue which express genuine concern over the education system. I hope you will enjoy reading the research papers.

– Samrat Bisai

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INTEGRATING GENERATIVE AI IN CAMBODIAN HIGHER EDUCATION: CHALLENGES, OPPORTUNITIES, AND INTERNATIONAL LESSONS

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ABSTRACT

Generative AI tools such as ChatGPT, Claude, and Gemini are now fixtures of academic life, and Cambodian higher education cannot afford to stand on the sidelines. This structured narrative review looks at the opportunities and risks generative AI creates for Cambodian universities, then draws comparative policy lessons from Singapore, the United Kingdom, the United States, and Australia. We purposively identified forty-six sources, twelve of them Cambodia-specific, most published between 2020 and 2026, and coded them against five themes: educational opportunity, academic integrity, governance, equity, and assessment. What emerges is a genuine trade-off: real gains in writing support, feedback, and research capacity, weighed against risks to integrity, accuracy, privacy, and equity. Each comparator system offers a different lesson: Singapore in national coordination, the United Kingdom in institutional rule-setting, the United States in human oversight, Australia in regulator-led planning. Drawing these threads together, we propose a whole-of-institution framework, not yet empirically validated, that adapts governance mechanisms from the four systems into Cambodia-specific guidance spanning institutional policy, AI literacy, redesigned assessment, faculty development, data protection, and equitable access. The underlying premise is simple: AI should support learning under human supervision, not to replace it.

Keywords: Generative AI; ChatGPT; Cambodian Higher Education; Academic Integrity; AI Literacy; Comparative Policy

INTRODUCTION

It has taken generative AI only a few years to go from novelty to daily habit in academic work such as drafting text, summarising readings, and suggesting directions for research. International bodies have responded by calling for measured, principled engagement rather than reflexive bans or uncritical adoption, framing AI integration as a matter of strategy, ethics, and pedagogical redesign (Sabzalieva & Valentini, 2023; Vidal et al., 2023).

These debates reach Cambodia at a formative moment. Its universities are widening access, strengthening quality assurance, building research capacity, and preparing graduates for a digital economy, and generative AI has arrived in the middle of all of it. Cambodian scholars have begun documenting both the promise and the unease it brings to local

classrooms (Heng & Sol, 2024; Chum, 2024), but that literature is still thin compared with how fast adoption is moving.

The core problem is that adoption is outrunning governance. Global scholarship on AI in higher education is growing fast, but very little of it speaks directly to Cambodian conditions — its infrastructure, language environment, research capacity, and governance arrangements. Policy built for another system will not simply drop into a Cambodian classroom; it needs translation. What Cambodia needs are principles suited to its own assessment habits, teaching capacity, and development priorities, informed by systems that have already grappled with these questions but not copied wholesale from them.

Cambodia's case is important beyond Cambodia's classrooms. It is one of the fastest-growing higher education systems in mainland Southeast Asia, but its national AI governance environment is nascent and formative. The national AI strategy of the Ministry of Post and Telecommunications is in draft (MPTC, 2025), and UNESCO's own assessment of its readiness found the ethical and regulatory groundwork only just beginning (UNESCO, 2025a). None of this is unique to Cambodia, a sector expanding faster than its regulatory infrastructure can track is a familiar story across the developing world. But precisely because Cambodia is building policy and capacity at the same time, rather than importing a ready-made regime, it offers a useful test of whether lessons from better-resourced systems actually travel.

This article pursues a central research question and three related objectives, set out at the end of the literature review below. Its argument sits between two extremes: treating AI purely as a cheating problem misreads what it is, while waving it through without safeguards is just as reckless.

LITERATURE REVIEW

Global Discourse on Generative AI in Higher Education

International bodies converge on a similar message: universities should meet generative AI with strategy, ethics, and pedagogical redesign, not knee-jerk bans. UNESCO calls for clear direction on appropriate use, staff training, and ethical safeguards, urging governments to regulate generative AI while holding onto a human-centred, rights-based approach to privacy and pedagogy (Sabzalieva & Valentini, 2023; Miao & Holmes, 2023). The OECD raises a similar set of concerns: integrity, privacy, bias, intellectual property, and treats governance as unsettled rather than solved (Vidal et al., 2023). Read together, this body of work frames generative AI first as a governance question, and only second as a technology question.

Bring that framing into a real classroom, though, and the tidy picture falls apart. Institutions haven't settled on how to react to AI, some treat it as a crisis demanding immediate control, others sense something quieter happening: the authority structures that teaching and assessment have always leaned on are shifting underneath everyone's feet (Bearman, Ryan, & Ajjawi, 2023). Sok and Heng (2024a) lay out six areas where Chat GPT opens up real opportunity, and each one drags a matching risk along with it. Francis, Jones, and Smith

(2025) name a similar set — explainability, bias, data integrity, cognitive offloading, and none of these problems stay contained. They grow right alongside adoption. One thing the research keeps confirming: AI-text detectors aren't dependable enough to serve as standalone proof of misconduct (Weber-Wulff et al., 2023). Nothing on the market clears that bar yet. Rather than betting on better detection tools, the more durable path is building shared AI-literacy skills across institutions (Long & Magerko, 2020).

This framing was confirmed in more expansive systematic reviews. Zawacki-Richter, Marín, Bond, and Gouverneur (2019) revealed that pedagogical and ethical responsibilities largely took a back seat to technical ones in these studies, an omission that Crompton and Burke (2023) later found had diminished only slightly across 138 studies, despite the tripling of publications. Kasneci et al. (2023) argue that large language models call for new pedagogical models, not incremental policy patches, a claim Luckin and Cukurova (2019) ground in learning-science research. Tlili et al. (2023) and Bozkurt et al. (2023) make the same argument also for ChatGPT in particular: they catalogue institutional responses across dozens of countries and find most reactive rather than strategic—the same imbalance observed through the lens of Cambodia in Section 2.2.

Generative AI in Cambodian Higher Education

At least here, the Cambodian scholarship records the same conflict. Cambodian students and teachers are already using ChatGPT to assist them with their teaching, learning and research, according to Heng and Sol (2024). Survey results from Battambang similarly reveal significant levels of engagement, especially in terms of translation and provision of writing, but low levels of formal training, and ongoing worries about privacy, bias and erosion of critical thinking (Hoeurng et al., 2024). A parallel survey of Cambodian EFL learners reported similar results, which showed that most had used AI, few had been taught, and privacy issues were also at play (Sol, Heng, & Sok, 2024). Qualitative research of English majors regarded AI as a useful addition but also a source of actual fear about cognitive reliance (Pum, 2025).

Institutional silence adds to the problem. Many Cambodian universities have not issued any policy on AI or integrity, Chum (2024) noted. Pum and Sok (2024) mention five major concerns—privacy, erosion of critical thinking, misbehavior, assessment validity, and biased information—that are raised against the benefits of customized learning and administration. Sok and Heng (2024b) argue that policymakers have to change policies of integrity for the misuse of generative AI. Keo, Sam, Lan and Wen (2024) add a disclaimer that it is not just policy silence that is slowing down adoption but infrastructure shortages and uneven digital knowledge.

National policy is starting to catch up. The Ministry of Education, Youth and Sport's Digital Education Strategy for Schools (MoEYS, 2025), UNESCO's completed AI ethics readiness assessment (UNESCO, 2025a), and the Ministry of Post and Telecommunications' draft National Artificial Intelligence Strategy (MPTC, 2025) together lay useful groundwork. But none of them yet addresses university-level assessment or academic integrity, and that is the gap this review sets out to fill.

Theoretical Framing

This review draws on three complementary strands rather than a single theory. AI-literacy scholarship supplies the competencies policy must cultivate (Long & Magerko, 2020). Human-centred, responsible-AI principles, echoed across the UNESCO, OECD, and United States guidance discussed above, supply the normative standard, and policy-transfer scholarship supplies the comparative logic: Dolowitz and Marsh (2000) distinguish a continuum running from direct copying through emulation to selective lesson-drawing, and argue that transfer only succeeds when the enabling conditions, not just the policy instrument itself, are also considered. We treat the four comparator systems here as sources for lesson-drawing rather than models to copy, which is why Section 4.3 and Table 6 record enabling conditions and limitations alongside each mechanism.

Two further frameworks sharpen individual components without displacing this core. Mishra and Koehler's (2006) TPACK model gives faculty development a working vocabulary, distinguishing the technological, pedagogical, and content knowledge lecturers need to integrate generative AI meaningfully. Puentedura's (2013) SAMR model does the same for assessment redesign, distinguishing tasks that merely substitute AI for existing work from those that redefine what the task actually measures. Adoption-focused models, the Technology Acceptance Model (Davis, 1989) and UTAUT (Venkatesh, Morris, Davis, & Davis, 2003), help explain why uptake varies (Section 4.2). We treat adoption as downstream of policy and literacy rather than a driver in its own right, but draw on TPACK and SAMR directly in the proposed framework (see Discussion).

Research Question and Objectives

This article is built around one central research question: what challenges and opportunities does Cambodian higher education face in integrating generative AI, and what can it learn from Singapore, the United Kingdom, the United States, and Australia?

Three objectives follow from this question:

1. Map the principal opportunities and risks that generative AI tools create for Cambodian universities.
2. Draw comparative lessons from four international systems on governance, pedagogy, and assessment.
3. Propose a practical, whole-of-institution framework for responsible AI integration in Cambodian higher education.

METHODOLOGY

Review Design

This review combines a structured narrative approach with qualitative comparative policy analysis. We judged a systematic, database-only review unsuitable: generative AI in higher education moves faster than publication cycles, and the relevant evidence spans genres no single database search can capture, such as scholarship, international guidance, national

policy, and sector reports (Sabzalieva & Valentini, 2023; Vidal et al., 2023). Rather than ranking studies by methodological weight, the design instead traces how governance thinking has developed internationally and in Cambodia, and identifies practices that plausibly transfer.

Search Strategy and Information Sources

We identified sources in four purposive stages between 6 and 28 May 2026: international guidance from UNESCO and the OECD; Cambodian scholarly and policy sources, including primary ministry documents; policy material from the four comparator systems and studies analysing them; and broader scholarship on opportunities, risks, integrity, and assessment. We searched Scopus, Web of Science, ERIC, and Google Scholar, plus relevant organisational and ministry websites; Table 1 summarises the parameters. Sources were identified purposively rather than through a single fixed protocol, so we kept no consolidated yield count, a limitation noted in the Conclusion, and did not assess Khmer-language publications given the English-only restriction.

A fifth stage (1–10 July 2026), following peer review, added eleven sources: ten foundational theoretical works on AI and technology-adoption theory, found through citation chaining and cited in Sections 2.1 and 2.3, and one Vietnamese government and UNESCO policy document (UNESCO, 2025b) supporting the regional comparison in Section 4.3. All eleven went through the same screening and coding process as the rest of the evidence base (Appendix A).

Table 1. Search parameters and final evidence base

Item	Detail
Search conducted	6–28 May 2026 (primary search, closed); 1–10 July 2026 (supplementary search, closed, 11 sources added)
Databases	Scopus, Web of Science, ERIC, Google Scholar
Other sources	UNESCO, OECD, national ministries, and the four comparator systems' regulator and university sites
Search concepts	Generative AI; higher education; Cambodia; academic integrity; assessment; governance
Example search string	("generative artificial intelligence" OR "generative AI" OR ChatGPT OR "large language model*") AND ("higher education" OR universit* OR college*) AND (Cambodia* OR "academic integrity" OR assessment OR governance)
Empirical and policy evidence period	2020–2026
Foundational theoretical sources	No fixed date restriction; included selectively via citation chaining to establish the conceptual framework (Section 3.2), not as evidence of current policy or practice
Language	English only
Final evidence base	46 sources (12 Cambodia-specific)

Note. Developed by the authors from the review protocol.

Eligibility and Source Selection

We retained sources that addressed generative AI in higher education directly and fell into one of five categories: peer-reviewed research; international-organization guidance; government or regulator policy from Cambodia or the four comparators; university-level AI policies or teaching resources; and sector or policy-institute reports. We excluded sources that addressed AI outside an education context, that covered systems other than Cambodia or the four comparators without contributing to the global governance picture, or that were unavailable in English.

These criteria produced a final evidence base of 46 sources, all cited in-text, twelve of them (26%) Cambodia-specific. Table 2 summarises how that evidence base breaks down.

Table 2. Composition of the final evidence base by source category

Source category	Count
Peer-reviewed journal articles	23
Government and regulator documents	9
International-organization publications (UNESCO, OECD)	5
Sector-body and policy-institute reports	2
University policies and teaching resources	2
Conference proceedings	1
Preprints and working papers	2
Media and public commentary	2
Total	46

Note. Developed by the authors from the reviewed sources.

Quality and Relevance Appraisal

We appraised sources by evidentiary function rather than a single quality scale, since a policy document can be the strongest available evidence of government intent even without peer review. Table 3 reports four tiers: empirical, authoritative policy, synthesis, and contextual, each answering a different question. Tier reflects function, not publication type: Chum (2024) counts as contextual; Sol et al. (2024) counts as empirical despite being a preprint, since it reports original data; and Sok and Heng (2024b) and Puenteadura (2013) count as synthesis, since neither reports new data. Where tiers disagreed, as when national strategy documents' readiness claims ran up against Hoeurng et al.'s (2024) survey evidence of low formal training, we coded the discrepancy itself as a governance gap (Table 4).

Table 3. Distribution of the evidence base by evidentiary function

Evidence tier	Definition	Count
Empirical evidence	Studies and reports presenting original data: surveys, interviews, detector testing, or systematic document analysis	8
Authoritative policy evidence	Primary government, regulator, international-organization, and official institutional policy documents	16
Synthesis or interpretive evidence	Literature reviews, conceptual analyses, and conference papers	20
Contextual evidence	Media commentary and sector-body position statements used only to corroborate a claim, not establish it	2
Total		46

Note. Developed by the authors from the appraisal described above.

Evidence Extraction and Thematic Coding

We read each source in full and coded it against five themes fixed before full-text coding began: educational opportunity, academic integrity, governance, equity, and assessment. These themes structure both the literature review and the comparative analysis. Each coded claim was also tagged by evidentiary origin, a documented Cambodian finding, international research, or a comparative policy lesson, so that the Results keep these categories distinct rather than blending them. All three co-authors coded jointly and resolved disagreements through discussion. Table 4, in the Results section, reports the coding outcome by theme with representative supporting sources.

Comparative-Case Selection

We selected Singapore, the United Kingdom, the United States, and Australia against five explicit criteria: documented national or sector-level AI guidance for higher education; at least one institutional implementation example; a governance mechanism not duplicated by the other three systems; direct relevance to the review themes; and plausible, if imperfect, adaptability to Cambodian conditions.

All four systems have far greater fiscal resources, regulatory capacity, and university autonomy than Cambodia does, so we treat their policies as sources for lesson-drawing (Dolowitz & Marsh, 2000) rather than as templates for direct transfer (see Table 6). This review does not include a full ASEAN case study; a system such as Malaysia, Thailand, Indonesia, or Vietnam, with resource constraints closer to Cambodia's own, would be a natural priority for future work.

Following reviewer feedback on regional applicability, Section 4.3 also discusses one supplementary comparator, Vietnam, drawing on a single UNESCO policy source. We did not select Vietnam against the five criteria above, and it is not a fifth fully coded case; it serves only as an illustrative, same-region reference point, pending the fuller ASEAN comparison that future work should undertake.

Ethical Considerations

This review draws exclusively on publicly available literature and policy documents and involved no human participants, so it required no institutional ethics approval. We used generative AI tools only as writing aids for structuring, synthesising, and grammar checking, which is never for authorship or analytical claims, consistent with the statement in the Declarations section.

RESULTS

Opportunities of AI Integration

For Cambodia specifically, AI tools open up a kind of learning support that matters right now, not in some future rollout. Many students write in English as a second or third language, and survey evidence shows they lean on AI chiefly for translation, grammar correction, and organising ideas, which is not wholesale essay generation (Hoeurng et al., 2024; Sol et al., 2024). Lecturers report similar gains: generative AI helps produce case studies, discussion prompts, rubrics, and feedback templates, among the uses the UK's Department for Education identifies as its clearest educational applications (Department for Education, 2025) and that Cambodian literature echoes (Pum & Sok, 2024). Sok and Heng (2024a) point to a third benefit: AI can sharpen research questions, organise literature, and improve academic writing, provided users still verify their sources.

Challenges and Risks of AI Integration

Academic integrity is the risk that surfaces first, and loudest, in both literatures. AI can produce essays and reference lists that look entirely original, and Pum (2025) finds that Cambodian English majors experience this less as a plagiarism problem than as a quieter anxiety, the sense of losing critical agency to a tool that thinks of them without anyone noticing.

Inaccuracy compounds the problem of integrity. Generative AI presents falsehoods with complete certainty, and Francis et al. (2025) relate this to broader problems surrounding explainability, prejudice, data integrity and cognitive offloading. Meanwhile, independent testing shows AI-detection techniques are neither accurate nor dependable; significant false-positive and false-negative rates render them inappropriate as single evidence of misbehavior (Weber-Wulff et al., 2023).

Additional issues are privacy and partiality. Sol et al. (2024) stated that data privacy was the biggest cause of student hesitancy. Vague laws expose universities to unintentional breaches of unpublished research or personal data. And since these systems are trained on patterns of data, questions concerning Cambodian history, the Khmer language, or local law may result in thin or wrong replies.

Equity is the quiet danger – subtle to spot because it doesn't shout out like integrity or accuracy issues. These tools benefit students with quicker internet, stronger English, and paid subscriptions more. A countrywide study indicated that Cambodian secondary students'

sentiments toward AI already vary with access and exposure (Sok, Heng, & Pum, 2025). If unchecked, the pattern might exacerbate existing inequities.

Table 4 summarises the coded evidence by theme, distinguishing documented Cambodian findings from international evidence, stating the resulting gap, and listing representative sources along with the number contributing to each theme. We develop the fuller policy implications later, in the Discussion.

Table 4. Thematic synthesis of coded findings

Theme	Cambodian evidence	International evidence	Main gap	Sources	Policy implication	Key sources
Educational opportunity	Writing, translation, and research support	Personalised learning and feedback	Limited formal evaluation of impact	14	Build formal evaluation and curricular integration around existing informal use	Hoeurng et al. (2024); Department for Education (2025)
Academic integrity	Policy and training gaps	Detection tools shown to be unreliable	Few Cambodian disclosure procedures	14	Replace detection-reliant policy with disclosure and process-based verification	Chum (2024); Weber-Wulff et al. (2023)
Governance	Emerging national digital strategy	Multiple regulatory models compared	No higher-education-specific framework	26	Extend existing digital strategies explicitly to university assessment and integrity	MoEYS (2025); TEQSA (2024)
Equity	Attitudes vary with access and exposure	Digital-divide concerns widely documented	No university-level access data	4	Build access, connectivity, and language support into any AI-encouragement policy	Sok, Heng, & Pum (2025); Sol et al. (2024)
Assessment	Limited local evidence base	Strong international redesign guidance	No Cambodian assessment trials	5	Redesign assessment formats before mandating AI-use rules	QAA (2023); Lodge et al. (2023)

Note. Developed by the authors from the thematic coding described in Section 3.5. Source counts are drawn from the 46-row source-by-theme coding matrix in Appendix A,

where most sources are coded to more than one theme; the five theme totals therefore sum to more than 46. Key sources listed here are illustrative, not exhaustive.

Comparative Policy Lessons

We compared four higher education systems, each illustrating a distinct governance mechanism: Singapore for national coordination, the United Kingdom for institutional rule-setting under near-universal student adoption, the United States for human-centred oversight, and Australia for regulator-directed planning. A wider scoping review of thirty university AI policies across Asia found that most institutions write policy for internal compliance rather than external accountability, prioritising rules for students over guidance for instructors (Dai, Lai, Lim, & Liu, 2024). The four systems below show what changes once governments and regulators, not just universities, take up that task. Table 5 summarises the documented experience in each system; Table 6 sets out enabling conditions and limitations.

Table 5. Comparative evidence from four higher education systems

Country	Governance mechanism	Key documented evidence
Singapore	National EdTech Masterplan translated into course-level university policy	Acknowledged AI use permissible by default in unsupervised NUS assessments; similar trend across all six national universities' integrity codes (Shchedrina, 2024)
United Kingdom	Sector principles plus QAA-driven assessment redesign	92% of 1,041 surveyed undergraduates had used AI tools; only 29% felt encouraged to do so (Freeman, 2025)
United States	Federal human-centred guidance plus institutional practice	Federal guidance requires human oversight; Cornell requires syllabus disclosure and source verification
Australia	TEQSA-directed institutional AI action plans	Registered providers directed to develop own risk responses under a process-people-practice model (TEQSA, 2024)

Note. Developed by the authors from the reviewed policy documents.

Singapore is the most obvious example of strategic alignment. The Ministry of Education integrates AI into the national EdTech Masterplan, with students at the heart of strategy and pedagogy before the technology itself (Ministry of Education Singapore, 2026). The National University of Singapore defaults to permitting acknowledged AI use in unsupervised assessments, but permits instructors to prohibit it when conditions warrant (National University of Singapore, 2024). An assessment of integrity rules at all six universities in Singapore revealed a similar pattern – promoting good use, not just punishing misuse (Shchedrina, 2024).

The United Kingdom is an example of what happens when policy follows behaviour instead of leading it. Sector bodies, including the Russell Group, have published shared principles (Russell Group, 2023) and the Quality Assurance Agency has told providers to

redesign assessment for the ChatGPT era, rather than rely on prohibition or detection (QAA, 2023). Nonetheless, a study of 1,041 undergraduates in 2025 indicated that 92% had used AI tools and 88% had utilized generative AI expressly for assessments, but just 29% felt encouraged to do so and only 42% felt staff were ready to engage with it (Freeman, 2025; see Figure 1).

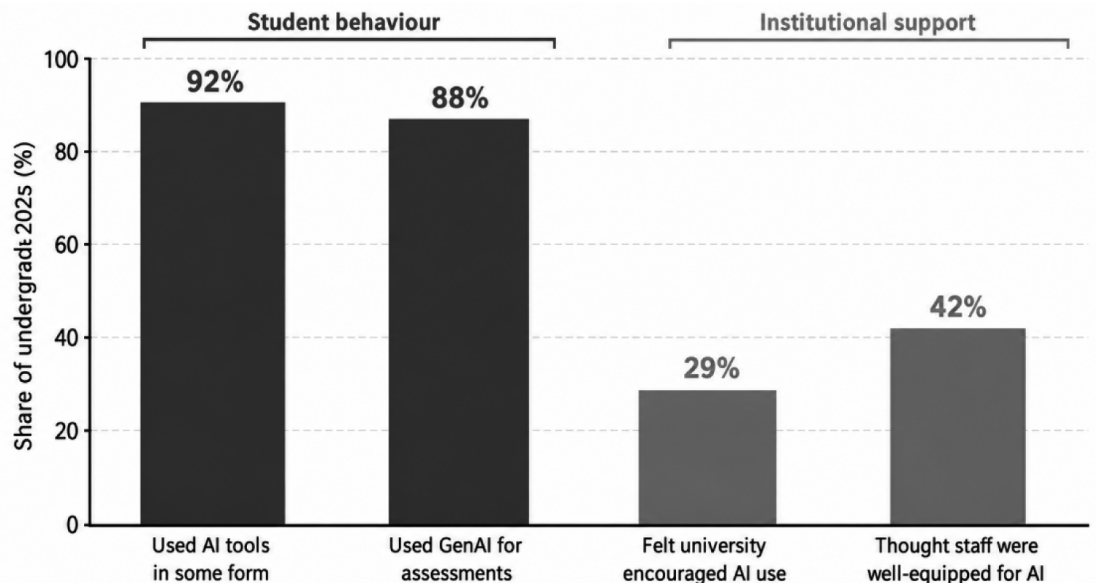


Figure 1. Undergraduate use of generative AI and institutional support.

Chart created by the authors using data from Freeman (2025).

The United States contributes a human-centred sensibility at the federal level, and classroom practice largely follows suit. Federal guidance argues that AI systems should keep people in the loop and remain safe, transparent, and equitable (U.S. Department of Education, 2023), though how institutions translate that varies widely (Wang, Dang, Wu, & Mac, 2024). Cornell University offers one example: syllabus disclosure, required attribution, reference verification, and evidence-based misconduct procedures (Cornell University Center for Teaching Innovation, n.d.).

Australia offers a governance template built for entire systems, not individual classrooms. Its regulator, TEQSA, directed registered providers to develop their own responses to generative AI risk, organising practice around process, people, and practice, rather than issuing one national rule (TEQSA, 2024). This built on an earlier discussion paper that argued for redesigning assessment around AI rather than policing it after the fact (Lodge, Howard, Bearman, Dawson, & Associates, 2023). Australia's schools sector had already adopted a similar posture (National Artificial Intelligence Taskforce, 2023).

Table 6. Enabling conditions, limitations, and adaptable elements across four comparator systems

System	Policy mechanism	Enabling condition	Limitation	Adaptable Cambodian element
Singapore	National EdTech Masterplan translated into course-level university policy	Strong central coordination and high state investment capacity	Depends on resources and coordinating authority Cambodia does not yet have at scale	Shared national guidance paired with course-level disclosure rules
United Kingdom	Sector principles plus QAA-driven assessment redesign	Mature quality-assurance infrastructure across universities	Guidance trailed 92% student AI adoption before principles were agreed (Freeman, 2025)	Course-level disclosure and redesigned, harder-to-fake assessment tasks
United States	Federal human-centred guidance plus Cornell classroom practice	Institutional autonomy allowing rapid classroom-level experimentation	Fragmented implementation with no shared national floor	Syllabus disclosure rules and evidence-based misconduct procedures
Australia	TEQSA-directed institutional AI action plans	A strong tertiary regulator with accreditation leverage	Assumes institutional capacity Cambodia's Accreditation Committee may still lack	AI action plans linked to accreditation and quality review

Note. Developed by the authors from the reviewed policy documents.

Vietnam offers a single regional reference point. Its AI governance environment is still forming, much like Cambodia's, and its own UNESCO readiness assessment finds no university-level policy addressing academic integrity or assessment (UNESCO, 2025b), the same gap this review documents for Cambodia (Section 2.2). That parallel strengthens the case for the proposed framework's relevance beyond Cambodia alone.

Read together, these systems show that no single template fits Cambodia. But each contributes a distinct, documented mechanism summarised in Tables 5 and 6, alongside Vietnam's parallel governance gap above, that the Discussion draws on to build a Cambodia-specific framework.

DISCUSSION

Taken together, the Cambodian findings and the comparative evidence point to one conclusion: Cambodia should treat AI integration as educational reform, not technical housekeeping. Neither of this review's two aims helping students and staff use AI well, and protecting academic standards from its misuse can succeed without institutional rules, prepared teachers, trained students, and rethought assessment. Banning the tools will not work, and neither will hunting for AI-written text, since detection tools remain neither accurate nor reliable (Weber-Wulff et al., 2023).

Building on the thematic synthesis in Table 4 and the comparative evidence in Tables 5 and 6, we propose the whole-of-institution framework shown in Figure 2. It is worth being clear about what this framework is: an author-developed normative synthesis, not an empirically validated model. It should be tested through institutional pilots and stakeholder consultation before wider adoption.

Development of the Proposed Framework

Each of the six components of the framework links back to a particular theme, comparative observation, or theoretical model. Institutional policy responds to the governance shortfall identified in Table 4 and adapts two mechanisms identified in Table 5 – Singapore-style disclosure-based default and Cornell’s disclosure-plus-verification model, chosen over outright prohibition because Weber-Wulff et al. (2023) demonstrate that detection cannot carry the evidentiary weight that prohibition would require. AI literacy addresses the training gap that Hoeurng et al. (2024) and Sol et al. (2024) document, following Singapore’s trajectory in prioritising AI literacy in strategy; TPACK (Mishra & Koehler, 2006) frames what that literacy should encompass for lecturers. Assessment redesign addresses the near-universal ungoverned adoption Freeman (2025) outlines as occurring in the UK and builds on Australia’s redesign-over-detection logic (Lodge et al., 2023); SAMR (Puentedura, 2013) differentiates between tasks that replace AI and those that redefine what assessment is supposed to measure — the underpinning of process-log and oral-defence formats presented below. It is faculty development that provides these TPACK competencies to lecturers in practice. Data protection addresses privacy concerns Sol et al. (2024) identify as students’ predominant hesitation (U.S. Department of Education, 2023). And equitable access answers Sok, Heng, and Pum’s (2025) access-linked attitudes among Cambodian students — a dimension with no direct analogue among the four comparators, since none of them faces Cambodia’s particular combination of infrastructure gaps and linguistic diversity at this scale.

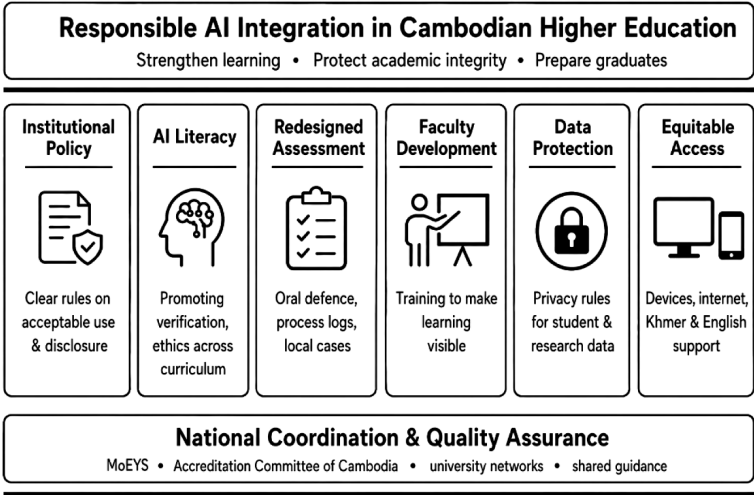


Figure 2. Author-developed, whole-of-institution framework for responsible AI integration in Cambodian higher education.

Clear institutional policy, then. Chum (2024) and Sok and Heng (2024b) both point out that there is currently no AI or integrity policy at Cambodian universities. The disclosure-based default of Singapore and the disclosure-plus-verification approach of Cornell demonstrate that viable alternatives are already available (see Table 5). What a university needs are rules that define acceptable use, require disclosure, and set consequences for misuse — while also protecting students from unfair accusation. No lecturer should treat an AI detector as proof of cheating; reading drafts, discussing the work, checking sources, and adding oral components all give far more reliable answers.

AI literacy needs to run through the curriculum, not sit in a single one-off workshop — echoing both the competency framing of Long and Magerko (2020) and the value Singapore places on it at the centre of its own strategy. This addresses a documented Cambodian gap head-on: most surveyed students report no formal AI training at all, despite high engagement with the tools themselves (Hoeurng et al., 2024; Sol et al., 2024).

Assessment is the next pressure point, and the UK's experience — near-universal adoption without matching guidance (Table 5), makes the urgency hard to miss. The traditional essay still has a role, but it works best alongside process logs, oral defences, annotated bibliographies, and locally grounded tasks: the redesign-over-detection logic Australian guidance already argues for (Lodge, Howard, Bearman, Dawson, & Associates, 2023), and the same shift from substitution to redefinition that SAMR formalises (Puentedura, 2013). Asking students to apply theory to a genuinely Cambodian problem, for instance, makes the task much harder to fake.

Equity is pressing. Cambodian secondary students' attitudes towards AI are already divided by access and exposure (Sok, Heng, and Pum 2025). Universities that encourage the use of AI will need to think about devices, connectivity, low-cost options, and Khmer language support and give more support to students who have weaker English skills. Otherwise, AI risks being yet another edge for pupils who already have plenty

These four cases speak to a broader question: why policy transfer from well-resourced systems succeeds in some developing-country contexts and stalls in others. Table 6's enabling-condition column points to a consistent pattern: transfer travels furthest where a coordinating authority with real leverage already exists, as in Singapore's Ministry of Education and Australia's TEQSA, and travels least well where policy has to bind without that authority, as both the UK's and the US's experiences show. Sequencing matters as much as content: building coordinating capacity before or alongside detailed rules is not a nice-to-have. Dolowitz and Marsh's (2000) point that transfer only succeeds when enabling conditions are considered turns out to be exactly the pattern Table 6 documents empirically.

National coordination, modelled loosely on the Australian and Singaporean examples, would hold the rest of this together. Cambodia already has some scaffolding to build on: the Digital Education Strategy for Schools (MoEYS, 2025), the draft National Artificial Intelligence Strategy (MPTC, 2025), and the completed UNESCO AI ethics readiness assessment (UNESCO, 2025a) — none of which yet addresses university assessment or

integrity. Extending their reach into higher education, alongside the Accreditation Committee of Cambodia and university networks, would let Cambodia produce shared guidance, model syllabus statements, and data-protection rules, while still leaving individual institutions room to adapt the details.

The direction is clear even if the exact path is not: Cambodia can learn from these systems without copying them outright, strategic alignment from Singapore, clear rules from the United Kingdom, human oversight from the United States, structured action planning from Australia — all adapted through the selective lesson-drawing approach set out in Section 2.3 to fit Cambodian capacity.

CONCLUSION

Generative AI is already part of academic life in Cambodia. The question is no longer whether universities should engage with it, but how. This review has traced two intertwined problems — real opportunities in learning support, teaching, and research, alongside real risks to academic integrity, accuracy, privacy, and equity, and drawn lessons from Singapore, the United Kingdom, the United States, and Australia on how governments and institutions elsewhere have begun to respond.

This review has clear limits, and they are worth stating plainly. It draws on published literature and policy documents rather than interviews or surveys, so its account of local practice rests on twelve Cambodia-specific sources, not new primary data. We identified sources purposively rather than through a single fixed protocol (Table 1), which limits reproducibility and may introduce selection bias. The English-language restriction meant we did not assess Khmer-language publications, which may understate perspectives available only in Khmer. The review also stops short of a full ASEAN case study. Section 4.3's brief Vietnam comparison is a deliberate scope boundary, since we did not code Vietnam against the same criteria used for the four core comparators (Section 3.6). Later work should collect empirical data from Cambodian universities and put the proposed framework to an empirical test.

In practice, responsible integration means institutional policy, AI literacy, redesigned assessment, faculty development, data protection, and fair access moving together, so that AI strengthens learning and protects academic integrity, rather than quietly substituting for either one.

DECLARATIONS

Authorship. All three authors contributed to conception, drafting, revision, and final approval, and accept accountability for the work as a whole; generative AI tools were used as writing aids only and were not granted authorship (COPE guidance).

AI use disclosure. Generative AI was used solely to support organization, synthesis, and language editing. All analytical claims were developed by the authors, who also verified every cited source.

Originality. The manuscript is an original synthesis of the cited literature with no material copied from those sources.

Conflict of interest. None declared.

Ethics approval. Not applicable; this review involved no human participants.

ACKNOWLEDGEMENT

No external funding was received for this manuscript. The authors thank the reviewers and editors of ANWESA for their guidance during the review process.

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Appendix A. Source-by-Theme Coding Matrix

Each of the 46 sources in the evidence base was coded against the five review themes: educational opportunity (EO), academic integrity (AI), governance (GOV), equity (EQ), and assessment (ASS). An “X” marks a coded theme; sources coded to more than one theme are marked in each applicable column. Column totals correspond to the Sources counts reported in Table 4.

Source	EO	AI	GOV	EQ	ASS
Bearman, Ryan, & Ajjaw (2023)			X		X
Bozkurt et al. (2023)	X		X		
Chum (2024)		X	X		
Cornell University CTI (n.d.)		X			
Crompton & Burke (2023)	X		X		
Dai, Lai, Lim, & Liu (2024)			X		
Davis (1989)				X	
Department for Education (2025)	X				
Dolowitz & Marsh (2000)			X		
Francis, Jones, & Smith (2025)		X			
Freeman (2025)	X		X		
Heng & Sol (2024)	X				
Hoeurng, Phorn, Kheav, & Sam (2024)	X	X			
Kasneci et al. (2023)	X				X
Keo, Sam, Lan, & Wen (2024)			X	X	
Lodge, Howard, Bearman, Dawson, & Associates (2023)					X
Long & Magerko (2020)	X				
Luckin & Cukurova (2019)	X				
Miao & Holmes (2023)			X		
Ministry of Education, Youth and Sport (2025)			X		
Ministry of Education Singapore (2026)			X		

Source	EO	AI	GOV	EQ	ASS
Ministry of Post and Telecommunications (2025)			X		
Mishra & Koehler (2006)	X				
National Artificial Intelligence Taskforce (2023)			X		
National University of Singapore (2024)		X	X		
PuenteDura (2013)					X
Pum (2025)		X			
Pum & Sok (2024)	X	X			
Quality Assurance Agency (2023)					X
Russell Group (2023)			X		
Sabzalieva& Valentini (2023)			X		
Shchedrina (2024)		X	X		
Sok & Heng (2024a)	X	X			
Sok & Heng (2024b)		X	X		
Sok, Heng, & Pum (2025)				X	
Sol, Heng, & Sok (2024)	X	X			
TEQSA (2024)			X		
Tlili et al. (2023)			X		
U.S. Department of Education (2023)		X	X		
UNESCO (2025a)			X		
UNESCO (2025b)			X		
Venkatesh, Morris, Davis, & Davis (2003)				X	
Vidal, Vincent-Lancrin, & Yun (2023)		X	X		
Wang, Dang, Wu, & Mac (2024)			X		
Weber-Wulff et al. (2023)		X			
Zawacki-Richter, Marín, Bond, & Gouverneur (2019)	X		X		

EXPLORING INDIAN KNOWLEDGE SYSTEM FROM THE PERSPECTIVES OF RAMAKRISHNA MATH AND RAMAKRISHNA MISSION

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ABSTRACT

This paper aims to present the changing dimension of the Indian Knowledge System with an exemplary approach to Ramakrishna Math and Ramakrishna Mission and its contribution to the well-being of mankind. It analyzes the content and philosophies of the Indian Knowledge System and its contextual adaptation into the institutional arrangement of Ramakrishna Math and Ramakrishna Mission. Since the establishment of the Ramakrishna Math in the later half of 1886 and the Ramakrishna Mission on 1st May 1897, the organizations have made a relentless effort to disseminate the values of the Indian Knowledge System in and through the avenues of education, spiritual life, and charity. There have been researches on the Indian Knowledge System and the activities undertaken by the Ramakrishna Math and Ramakrishna Mission but only a few attempts to understand how the organizations understand and internalize the Indian Knowledge System in the modern milieu. This research tries to address this through an analysis of strategies implemented by Ramakrishna Math and Ramakrishna Mission in upholding, renegotiating and disseminating the Indian Knowledge System. The paper elucidates how the Ramakrishna Math and Ramakrishna Mission are conduit between the age-old Indian traditions and the contemporary problems of mankind in general, thereby throwing new light upon the importance of the Indian Knowledge System in the contemporary system of education and society.

Keywords: *Indian Knowledge System, Culture, Manana, Sravana*

INTRODUCTION

The Indian Knowledge System (IKS) originates from the Vedas (Mandavkar, P. 2023) and is thought to foster ethical thinking, critical learning and sustainability in students (Mishra, et al. 2024). The IKS is intricately linked to India's culture, history, intelligence and spirit, and these roots are increasingly being studied to understand the Indian cultural diversity (Sudhakar, K. 2024). Experts advocate for integrating traditional knowledge, including languages, sciences, arts and philosophy, in the modern curriculum to provide a complete

education, although obstacles include teacher training, resources and curriculum balancing (Gaur, 2024).

Ramakrishna Math and Ramakrishna Mission are well known for their dedication towards the indigenous knowledge of India and have played a pivotal role in the preservation and promotion of the Indian Knowledge System. The twin organizations, for over a century and a quarter, have adhered consistently to Indian channels of wisdom and practiced the same through spiritual activities and social service.

Multifarious activities of Ramakrishna Math and Ramakrishna Mission are based on the eternal truth of Vedanta that was realised by Sri Ramakrishna and carried forward by Swami Vivekananda, and is beautifully depicted in the motto of the twin organizations: “आत्मनो मोक्षार्थं जगद्धिताय च” which means “for the Salvation of one’s own soul and for the good of the world” (Vivekananda, 1960).

Ramakrishna Math and Ramakrishna Mission are interdependent organizations and the nucleus of a worldwide spiritual movement often called the Ramakrishna Movement, whose objective is to spread the idea of harmony between religions, serve man as God through spreading education, promoting research, rendering medical service, services to orphans, the aged, the infirm, the invalid, the afflicted, etc., working for the welfare of the poor and the downtrodden (The General Secretary, Ramakrishna Math & Ramakrishna Mission, 2025), and developing human personality through an integrated practice of Jnana, Bhakti, Yoga and Karma, regardless of creed, caste, race, or nationality. (The Ramakrishna Movement–Sri Ramakrishna Mission Vidyalaya Polytechnic College, Coimbatore, n.d.).

Ramakrishna Math is a monastic order for men, founded by the monastic disciples of Sri Ramakrishna (1836-1886) led by Swami Vivekananda (1863-1902), while Ramakrishna Mission is a registered society where monastic of the Ramakrishna Math as well as lay devotees serve mankind in various capacities. This organization was founded by Swami Vivekananda.

While Ramakrishna Math and Ramakrishna Mission and all their branches are separate institutions in terms of legal structure, they work together since the Trustees of the Math form the Governing Body of the Mission. The monks of the Ramakrishna Math are largely responsible for administering the work of the Mission and both organizations have their headquarters at Belur Math. Although both are actively involved in charity and social welfare work, the former is involved more in spiritual activities, while the latter’s aim is more to serve mankind through a multitude of service activities delivered from a spiritual attitude (The General Secretary, Ramakrishna Math & Ramakrishna Mission, 2025).

Ramakrishna Math and Ramakrishna Mission have acted as a crucial institutional interface between traditional Indian knowledge, particularly the Vedantic, devotional, and guru-shishya traditions and the contemporary experience by:

- (1) publishing classical religious texts and commentaries on them,
- (2) elaborating a systematized integral educational philosophy derived largely from Swami Vivekananda’s thought into schools, colleges and teacher training institutions,

(3) sponsoring research, academic papers and translations that contribute to integrating the Vedantic and Indian religious thoughts in the modern intellectual discourse, and

(4) providing social services related to healthcare, rural development, and skill development from a spiritual standpoint.

Thus the organizations have become a key vehicle for bringing classic spiritual knowledge to the general population (Service as a Way of Life, n.d.).

Swami Vivekananda laid down the definition of education as “the manifestation of the perfection already in man” (Vivekananda, 2022) which restates the Upanishadic concept of self-realization and self-discipline in the terms of mass education, social progress and modern institutions. The concept also laid the basis for all later initiatives by the Ramakrishna Mission to set up schools, colleges and teacher training institutions leading up to a deemed university.

OBJECTIVE

To critically investigate the role of Ramakrishna Math and the Ramakrishna Mission in preserving, interpreting, and disseminating Indian Knowledge System.

METHODOLOGY

This study adopts a qualitative and interdisciplinary approach using a descriptive research design. It relies on textual and historical analysis of primary sources, including the teachings of Sri Ramakrishna and the Complete Works of Swami Vivekananda, along with secondary scholarly literature.

DELIMITATION

This study is delimited to the investigation of Indian Knowledge System with special emphasis on the practices on the Ramakrishna Math and Ramakrishna Mission, with special reference to Sanskrit Scriptures, the residential system of education, pedagogy and curriculum adopted at the educational institutions, the Vidyarti Vrata and the delivery of selfless service.

CULTURAL AUTHORITY AND SYMBOLIC POWER OF SANSKRIT

The ancient Indian language that constitutes an integral part of the Indian Knowledge System is Sanskrit. The Vedas and Upanishads were all articulated in the Sanskrit language by the sages and seers. Thus, the significance of the Sanskrit language as a vessel of IKS is indisputable. Nevertheless, in contemporary India, Ramakrishna Math and Ramakrishna Mission have upheld the Sanskrit language with respect. Swami Vivekananda’s admiration for Sanskrit language was prominently emphasized in his address titled ‘The Future of India’ delivered in February 1897 in Chennai (then Madras). He regarded Sanskrit language as the embodiment of classical authority in India. When he asserted that ‘Sanskrit and prestige go together in India’, he alluded to the social and psychological influence that the knowledge of Sanskrit confers (Vivekananda, 1944).

DEVELOPING NATIONAL CHARACTER

In the eyes of Swami Vivekananda, the Upanishads, the Bhagavad Gita and the Vedanta Commentaries were dynamic reservoirs of ideas that have a reforming potential. It is the teaching and learning of Sanskrit that enables direct access to the hundreds of ancient Indian texts, without having to take the assistance of translations, which may be having interpretive limitations. The teaching and learning of Sanskrit also opens doors for us to a multitude of philosophical frameworks that were marginalized under the colonial education system. This larger perspective has been intertwined with the notion that it is the spiritual learning which provides stimulus for world progress. Swami Vivekananda delivered several lectures wherein he equated education with man-making or character-building, a training process to imbibe courage, solidarity and reform one's nation through cultural inheritance. He viewed Sanskrit learning not just as academic instruction but as a means to develop national character and was committed throughout his life to transmitting the eternal truths of the Vedas and the Upanishads to posterity. Sanskrit, being the language of the Vedas, was highly revered by him. He unequivocally stated that the phonetic of the very word 'Sanskrit' is enough to impart to a nation, dignity, power, and vigor, and considered it possible for Sanskrit to become the means for national integration as a cultural linguistic asset.

On the fateful day when Swami Vivekananda attained Mahasamdhi—July 4, 1902, he predicted that, at a fitting time in the future, a Vedic institution to inculcate studies of Sanskrit and Vedas would come up on the precincts of Belur Math, and through this, ignorance would be dispelled and superstition eradicated. Nine decades later this very vision was realized, and Vivekananda Veda Vidyalaya was established on August 16, 1993 by the then President of Ramakrishna Math and Ramakrishna Mission, Swami Bhuteshananda, in the garden house of Nilambar Babu at Belur Math.

ROLE OF VIVEKANANDA VEDA VIDYALAYA

Vivekananda Veda Vidyalaya, operated by Ramakrishna Math, is a residential higher secondary institution dedicated to Devabhasha (divine language) Sanskrit—it is a Vedic institute and endeavors for propagation of Vedic and Sanskrit studies amongst students and provides education in Sanskrit grammar, Sanskrit literature, Indian philosophy, Vedic studies, Upanishadic studies, etc. It is not easy to find such a system of Sanskrit study in India nowadays and the Vivekananda Veda Vidyalaya serves as a torchbearer of Sanskrit study, throwing light upon India's knowledge and inspiring a general awakening across the country. Ramakrishna Math, thus, is not merely a rich storehouse of ancient texts but represents a dynamic movement for reviving ancient epistemologies and pedagogies through educational practices in institutions like the Veda Vidyalaya (Ramakrishna Math Vivekananda Veda Vidyalaya, n.d.).

THE LEGACY OF GURUGRIHAVASA

When we take a close look, we find that the Gurukul was the epitome of residential education in ancient India times. Here Vidyarthi's, i.e., disciples, used to reside with the

teacher, i.e., Guru, a burning light of knowledge (Shrinamananda & Gupta, 2026), in his house, i.e., Gurukul, and their education comprised not only intellectual but also physical, moral and spiritual training. 'Gurukul' has been derived from the combination of the two words 'Guru' (teacher) and 'Kul' (family or house). So, it is the family of the Guru which meant the entire institution. In Gurukuls, lessons were taught through the method of 'Sravana-Manana-Nididhyasana' (Brihadaranyaka Upanishad, 2/4/5), i.e., listening, reflecting and contemplating, and knowledge was transmitted mainly through the method of oral delivery. This age-old method of Gurukul learning has been practised by the Ramakrishna Mission since its inception. The Mission works on the principle of Gurukul or Gurugrihvasa. The students live together under the environment set by the Gurus. Also, as a part of training, brahmacharis live with the Gurus and get spiritual education, training in rituals, scriptural study and moral discipline in a continuous process. The educational institutions under Ramakrishna Mission are mostly residential, and the daily life of students comprises prayer, moral as well as spiritual guidance in the presence of the monastic Gurus. It not only includes academic learning with stress upon moral training and spiritual thoughts, but also recitation of Vedic verses, meditation and moral storytelling (Neeti Katha) alongwith practice of suitable performing arts (Bhaktigeeti, Bhajan, Kirtan etc). In Ramakrishna Mission, character building, spiritual tradition, modern education and branches based on vocational technology are considered important. In ancient days, the number of students in Gurukuls was very limited, however, the number of students in Gurugrihvasa under Ramakrishna Mission, now, is huge. Ancient Gurukuls used to offer their services only to the upper classes of the society, but in Ramakrishna Mission, all, under a specific age limit, irrespective of caste and religion, are provided with the opportunity to learn.

EMPHASIS ON SRAVANA, MANANA, AND NIDIDHYASANA

In the Upanishadic tradition of India, education is seen not merely as information transfer, but as gradual absorption of knowledge, culminating in a changed personality (Shrinamananda & Gupta, 2026). This process is centered around the triadic concept of listening (Sravana), reflection (Manana), and contemplation (Nididhyasana).

These three concepts of listening, reflection, and contemplation constitute an entire system, the journey from information to understanding, from understanding to Knowledge. Swami Vivekananda extensively studied this Vedic methodology and presented this in the context of the modern day as the science of man-making education, which implies the integration of intellect, will and emotion to the educational practices. The spiritual community of Sri Ramakrishna Paramahansa at Dakshineswar, comprising Him and His disciples, implemented this age-old Vedic education and later, within the educational institutions of the Ramakrishna Mission, the same practice of listening, reflection, and contemplation was introduced as a teaching-learning system.

Application of the method in educational institutions under Ramakrishna Mission:

Sravana: Listening to orations, storytelling, recitation and readings (of texts like the

Gita, Upanishads, Kathamrita, the Writings of Swami Vivekananda, etc.) and speeches and discussions by monks and scholars;

Manana: Developing critical thinking and critical reasoning, discussions on texts listened to, philosophical topics, and relating them to current affairs, prompted by questions;

Nididhyasana: Metacognitive learning and the internal practice of meditation to facilitate Knowledge.

IKS IN THE CURRICULUM

The educational institutions under Ramakrishna Mission have been instrumental in propagating the Indian Knowledge System through their curricula which comprises courses and papers on Indian Culture and Spiritual Heritage, Ayurveda, Yoga, Ancient Indian Agricultural Techniques, Classical Music, Ancient Indian Languages like Sanskrit, Tamil, Pali, etc., Indian Psychology, Indian Philosophy, Indian History, Indian Art forms, etc. The curricula of the institutions ensures that the students get the best of the East and the West, while simultaneously developing a sense of pride in the knowledge and wisdom of ancient India.

VIDYARTHI VRATA—ETHICAL FORMATION OF STUDENTS

One of the most striking elements of Indian educational culture is the Vidyarthi Vrata, the vow of the student. With great sincerity, the students of the educational institutions of Ramakrishna Mission starts the new academic year by taking pledges through Vedic recitations (Mantras). A brief explanation of the pledges may be summarized as follows:

The first pledge addresses physical health, which can be achieved through exercise, playing games, proper food and maintaining good health standards.

The second pledge is related to constant and rigorous study of any subject and is oriented towards consistent application of principles.

The third pledge is directed towards practice of truth in words, thought and deed.

The fourth pledge is concerned with performing duties and acts out of non-self-centeredness of feeling and action.

This fifth pledge is associated with the awareness of social good.

Students newly admitted participate in offerings (ahuti) into the sacred fire (homa-agni), while reciting mantras. After duly completing the establishment of the sacred fire (agni-sthapana) the students recite the sankalpa-vakya (statement of resolve). With devotion to the Supreme Lord and aspiring for knowledge, wisdom, courage, and strength, the students resolve to observe the Vrata (vows) to the best of their ability throughout their studenthood. For this purpose, in the presence of the sacred fire representing the Supreme Self (Paramatman), the Vidyarthi (students) utter the words of resolution and perform the homa with the mantra:

‘शरीरमाद्यं खलु धर्मसाधनम्’ इति नीति-वाक्यम् अवधार्य
 श्रम-क्षम-नीरोग-शरीराय स्वास्थ्य-विधिपालनपरो
 भवितुम्-अहम्-यथासाध्यं यतिष्ये।

[Human body is the primary means of practising all virtues and duties (dharma)—in view of this discerning truth, I shall try my best to keep my body healthy and fit for hard work. I shall do this by meticulous observance of all health rules.] (Nirvedananda, 2014)

Beginning with the above, the students utter five pledges and offer oblations into the sacred fire. The vows taken at the Vidyarti Vrata orient towards maintaining social harmony and appropriate conduct.

SEVA AS SPIRITUAL PRACTICE

Seva, or selfless service is central to the multifarious activities of Ramakrishna Mission as well as the very philosophy of it. The philosophy of Seva is deeply rooted in the spiritual teachings of Sri Ramakrishna, carried forward and materialized by Swami Vivekananda. In the Ramakrishna Mission, Seva is considered as a path to the Divine—not as mere charity. The concept of Seva, in this case, may actually be perceived as a vedantic consideration, in which the unity of all existence as the Supreme is advocated.

It is from Sri Ramakrishna’s teachings that we can derive the underlying essence of the spiritual significance of Seva at the Ramakrishna Mission, which considers, firstly, service should be seen not as an act of condescension or compassion, but an act of devotion; secondly, the depressed classes should be considered the living embodiments of God and should be worshipped and served accordingly. Seva is closely related to Karma Yoga, the path of selfless action laid down by the Bhagavad Gita, a philosophy which emphasizes performing one’s duties without any attachment to the fruits of one’s actions. Karma Yoga purifies the mind and facilitates spiritual growth (Radhakrishnan, 2008). Swami Vivekananda’s interpretations of Karma Yoga (Vivekananda, 1939) in a modern social and spiritual context laid the foundation for Seva at Ramakrishna Mission. For Swami Vivekananda, work itself was worship and social service—meditation in action, and therefore, a valid pathway to liberation. Institution of Seva has acquired a concrete dimension with the founding of Ramakrishna Mission as a concrete integration of spirituality and service (Sil, 1997). Mission’s social services range across various fields like education, health, rural development, relief work, and activities for the welfare of tribal communities, etc. Overall, the philosophy of Seva in Ramakrishna Mission has come to mean a perfect blend of spiritual idealism and social service, based on a sound philosophical basis, operating through a method of Karma Yoga and providing a positive framework to address both the material and the spiritual needs of humanity and ultimately bringing about transformative changes both in the giver and the receiver of Seva.

KEY FINDINGS

This study intended to explore the Indian Knowledge System from the perspectives of the Ramakrishna Math and Ramakrishna Mission. Exploring themes like the philosophical

foundation of the twin organizations, i.e., Vedanta, innovations in the field of education, efforts in shaping the Indian cultural identity through the Sanskrit language, and the bridging of tradition and modernity, it has been found that:

- The twin organizations have exemplified a harmonious blend of spiritualism and service.
- The organizations have applied the concept of ‘Shiva Jnane Jiva Seva’ propounded by Sri Ramakrishna and put to practice by Swami Vivekananda, where service to man is realised as service to the Divine.
- The organizations have applied the triadic pedagogy of ‘Sravana’ (listening), ‘Manana’ (reflection), and ‘Nididhyasana’ (contemplation), which comes from the Upanishads and highlighted the man-making nature of education.
- The organizations have contributed towards bringing Indian minds out of the colonial mindset through the promotion of Sanskrit Education as well as democratized learning through making Sanskrit Education accessible to all, across social groups.
- The organizations have revived the Gurukul system of education and made it accessible to all regardless of caste, creed, religion, etc, thus aligning an ancient learning system with contemporary social values.
- The success in the endeavor of Ramakrishna Math and Ramakrishna Mission towards preserving and disseminating Indian Knowledge Systems lies in the ability of the organizations to not just containing IKS but contextualizing it to the contemporary society. IKS, in this case, becomes a dynamic stream and not a mummified glory.

CONCLUSION

Ramakrishna Math and Ramakrishna Mission play an important role in keeping the wisdom of ancient India alive as well as in getting it adapted to the contemporary circumstances. The ideology of the twin organizations, grounded deeply in Vedanta and inspired by the vision of Swami Vivekananda, lays emphasis on selfless service. This paves the pathway for social contribution through various avenues. The organizations show ways in which the ancient doctrines of Vedanta can be adapted to the modern day, reflecting a rare adaptive spirit. The education system of Ramakrishna Math and Ramakrishna Mission represents the ideal of ‘man-making’ education, which aims at the all-round development of the human being—never merely to make a success in the annual exam. At a time when the Western education system has spread far and wide in India, Ramakrishna Math and Ramakrishna Mission’s effort to adapt the Indian Knowledge System to modern learning demonstrates an educational model that focuses on the balanced development of human being, uniting the past of India and the present in a common framework, and providing an alternative blueprint for the education of future India.

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AVADHANA AS A FRAMEWORK FOR DEVELOPING ATTENTIONAL CONTROL IN EFL LISTENING

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ABSTRACT

The proposed conceptual article proposes modifying the traditional Indian mental discipline of avadhana, defined as multidimensional, targeted attention, as a valuable learning resource in English as a Foreign Language (EFL) listening pedagogy, grounded in the core concept of avadhana. Avadhana, which translates to careful attention, represents an advanced practice in which the practitioner demonstrates exceptional attentional regulation through the capacity to perform a multitude of cognitive tasks across diverse domains, including linguistic processing, memory recall, pattern recognition, and creative composition. Although bottom-up and top-down processing are the primary approaches currently used in EFL listening pedagogy, they fail to adequately address the significant attentional complexities learners face when processing authentic speech, which demands concurrent processing of phonological, lexical, syntactic, pragmatic, and paralinguistic information. Informed by classical Sanskrit literature and contemporary forms of avadhana practice, the paper elucidates how the multidimensional attentional model of avadhana bridges critical gaps in existing pedagogy by cultivating focused concentration (ekagra-chitta), divided attention control (vibhakta-avadhana), attentional switching (chala-avadhana), and sustained attentional endurance (sthira-avadhana). This conceptualization redefines EFL listening as a trainable process of advanced attentional coordination through a structured, gradual program. It offers practical implications for EFL curriculum development, classroom instruction, assessment methods, and teacher education, alongside recommendations for empirical validation of this attention-oriented approach.

Keywords: Avadhana, Attentional Control, EFL Listening, Divided Attention, Cognitive Training.

INTRODUCTION

Listening in a foreign language poses serious attentional difficulties that modern pedagogy fails to address. EFL students have to process phonological information at a rate near that of native speakers, trigger lexical access, syntactic frame, structure, semantic representations, pragmatic intents, and self-monitoring of their own understanding, at the same time, and under the same cognitive load and emotional load like anxiety or confusion (Siegel, 2022; Goh and Vandergrift, 2021). This multidimensional attentional requirement is what distinguishes the process of listening from other language skills, whereas existing pedagogical strategies train attention at the surface level, providing generic instructions to focus or concentrate and not teaching attentional regulation (Field, 2009; Goh & Vandergrift, 2021).

The ancient Indian tradition of avadhana provides a structured framework for

developing the intricate attentional skills needed for active listening. Avadhana (Sanskrit: avadhana), (meaning) attention, (concentration), (careful observation), is a separate tradition of cognition and literature, where a practitioner (avadhani) is asked to respond to various challengers (prucchakas) who come up with various tasks, such as spontaneous poetry in multiple languages, mathematical computations, memory games, linguistic puzzles and rhythmic patterns. There is a literature of historical performances of eight simultaneous challenges (ashta-avadhana), and highly accomplished practitioners in one hundred simultaneous challenges (shata-avadhana) or one thousand chronicled (sahasra-avadhana). Contrary to entertainment, avadhana is a scientific development of attentional resources, based on intensive training, and reflects psychological concepts that the modern science of cognition is just beginning to apprehend (Rao and Paranjpe, 2016).

This theoretical paper suggests modifying avadhana principles as a pedagogical approach to teaching EFL listening. It contends that avadhana fills key gaps in existing strategies and offers a systematic procedure of cultivating four vital capacities of attention-focused concentration (ekagra-avadhana); capacity to sustain single-pointed attention on particular features of audio; divided attention (vibhakta-avadhana); capacity to process multiple dimensions of speech simultaneously; attention switching (chala-avadhana); ability to remain attentive over lengthy stints of listening; and enduring steadiness (sthira-avadhana). It is based on this classical tradition of attentional training that the educators of EFL listening can cease pointless exhortations and focus on systematic practices that will gradually develop the attentional framework necessary for effective listening comprehension.

THEORETICAL FOUNDATIONS

The Tradition of Avadhana

Formal practice Avadhana came to serve as a formal practice in classical Indian literary culture, with references in Sanskrit literature dating back more than a thousand years. The practice is a form of performance art in which an avadhani (practitioner) sits at the center, and several prucchakas (questioners or challengers) surround them, each posing various challenges at once. These difficulties cut across various mental areas. Intricate metrical exercises: In classical avadhana, versatile tasks of composition of Sanskrit verses by a complex metrical pattern, answering questions on Vedic texts, solving mathematical problems, word games with reversals and anagrams, retention of memory of randomly ordered objects, the keeping of rhythms in drums, and answering philosophical questions were all done to the same task. The avadhana cognitive architecture incorporates a range of dimensions for focus. Dharana means being able to store and retain information in the working memory as one works with the incoming stimuli. Smarana is the recall of pertinent knowledge from long-term memory during cognitive load. Chitrata refers to the innovative integration required to produce new reactions and handle multiple streams of attention. It is not only the learning of the act itself but the metacognitive ability to distribute, track, and alternate the distribution of attention to conflicting demands, which is what it takes to listen effectively in a foreign language (Rao & Paranjpe, 2016). Traditionally, avadhana was what came after years of simpler systematic practice. Ekavadhanama (single attention) laid the groundwork for

concentration when students learnt to focus on one and only one complex task. Dviavadhana (two-fold attention) ushered in the parallel processing of two activities. Gradually, the students progressed to chaturaavadhana (four), ashtaavadhana (eight), and shataavadhana (hundred) stages (as the top performers of exceptional caliber). This developmental trend from single-pointed to more diffuse attention may suggest a developmental model that could be applied to listening pedagogy. Modern avadhana teachers describe the practice's phenomenology as a state of relaxed alertness, in which attention is not effortful but fluid, flowing naturally between tasks without tension. This condition is similar to what psychologists refer to as flow (Csikszentmihalyi, 1990) and to Vedic tradition's sahaka-samadhi (natural absorption). The habit trains what classical literature describes as the state of chitta-ekagrata (one-pointedness of mind); ironically, multitasking trains metacognitive control, which improves all attentional abilities.

Attentional Challenges in EFL Listening

Current studies in EFL listening indicate that attention is central to comprehension, but provide little information on the development of attentional capacities. The listeners experience conflicting demands at several processing levels: at the phonological level they need to distinguish between nonnative phonemes and decode the prosody; at the lexical level they need to retrieve meanings quickly despite unfamiliar words; at the syntactic level they need to decode the structures, and at the discourse level they need to monitor referents and construct coherent mental representations (Field, 2009; Newton and Nation, 2021; Rost, 2015; Siegel, 2024).

These requirements are not used sequentially but rather in parallel. Neuroimaging and eye tracking demonstrate that effective listeners use the continuous interaction of top-down and bottom-up processes at the continuous level (Rub Corinth and Hui, 2025; Rubin, 1994). However, novice EFL listeners tend to be unable to control the complexity of attention and usually experience attention tunneling, difficulty switching focus, and lack of endurance, which inhibit comprehension (Field, 2008; Graham, 2006; Sharif et al., 2024). Modern pedagogy recognizes these difficulties, but it mainly tries to reduce the burden rather than actively develop attention skills, whereas the avadhana tradition offers a training method specifically designed to improve attentional capacity.

Cognitive Load and Attention in L2 Listening

New developments in cognitive load theory also provide further theoretical support for attention-centered listening pedagogy. Seufert (2020) points out that it is not only necessary to curb cognitive load by decreasing extraneous processing but also to engage learners in strategic training to address more intricate levels of complexity over time. This is in accordance with the principle of avadhana, the gradual cultivation of attention instead of simplification. Equally, studies on executive functions have shown that attentional control, working memory, and cognitive flexibility can be improved through specific training activities (Diamond and Ling, 2020; Karbach and Unger, 2014).

The neuroscience of attention also sheds light on why systematic attention training

can be helpful for L2 listening. The alerting, orienting, and executive control attention systems are brain attention networks that are highly plastic to training (Petersen and Posner, 2012; Tang et al., 2022). The mindfulness-based attention training, which has been demonstrated to have philosophical roots in the avadhana practice, has been shown to produce quantifiable alterations in sustained, selective, and switching attention, both in behavioral and neuroimaging studies (Malinowski, 2013; Tang et al., 2022). These findings suggest that L2 understanding may be enhanced through neuroplastic processes that strengthen the attentional skills of listening used in the pedagogy of avadhana.

Bridging Avadhana and EFL Listening Pedagogy

To modify avadhana to EFL listening, the correspondence between traditional and modern learning settings that are pedagogically relevant must be found. Avadhana has four dimensions that are productively translated into listening instruction. To begin with, ekagra-avadhana (focused concentration) implies the ability to attend to a specific aspect of speech (e.g., phonological patterns, discourse markers, speakers' attitudes) and maintain that attention. Second, vibhakta-avadhana (divided attention) resembles the requirements of concomitant processing that learners encounter when they must apply more than one level of linguistic meaning. Third, chala-avadhana (flexible attention switching) is associated with the adaptive attention management needed when comprehension is disrupted or when priorities shift during listening. Fourth, sthira-avadhana (sustained endurance) concerns the endurance required for listening to a lecture, a podcast, or a conversation.

The developmental hierarchy of the standard avadhana training offers a structure of listening training programs. Starting with ekavadhanama (single-focused attention), the students learn basic concentration on singly isolated aspects of speech. Going to the next level of dviavadhana (dual attention), they train their minds to attend to two levels at once. These progressive levels add additional dimensions of attention, leading to the integrated, fluid attention typical of listening. This orderly development compares with the traditional methods that seek to instantly provide the inexperienced listeners with the multidimensional demands.

Essentially, avadhana training focuses on building attentional capacity through practice, rather than simply accommodating the limitation through scaffolding. Although scaffolding may still be a pedagogically useful tool, avadhana proposes that attentional abilities can be developed through systematic, progressive challenge, a view endorsed by cognitive research on training working memory and attentional plasticity (Diamond and Ling, 2020; Jaeggi et al., 2008; Karbach and Unger, 2014). Such training orientation is a transformation of pedagogy to simplify tasks to the present capacity and gradually increase to the authentic listening demand capacity.

THE AVADHANA-BASED LISTENING FRAMEWORK

Ekagra-Avadhana: Focused Concentration Training

Avadhana is based on one-pointed concentration, i.e., ekagrachitt: the capacity not to divide the mind but maintain concentration on one object. When applied to EFL listening,

ekagraavadhana builds on learners' skills to attend to specific aspects of speech and filter other stimuli, which are the foundations of more intricate distributed attention. Ekagra avadhana listening identifies certain particularities of speech. Phonological activities focus on paying attention to just phonemes, just stress, or just intonation, and nothing more; lexical activities concentrate on recognizing new words without general understanding; and pragmatic activities involve discourse markers, attitudes of speakers, or emotional undertones. This pedagogy focuses on time and length: students practice sustained concentration on a single object, followed by recording observations, discussing difficulties, and contemplating how to maintain attention, which is similar to the development of avadhana in traditional single-to-multitasking training.

Ekagra avadhana is also enhanced by mindfulness meditation. Moment awareness, created by a brief pre-listening meditation, enables learners to observe when the mind has drifted to other places and bring it back with a sense of gentle force and focus. This is an aspect of the mind that is trainable. Post-listening reflection is about disruption and effective strategies. Studies indicate that mindfulness boosts selective attention, reduces mind wandering, and enhances language understanding during the learning process (Malinowski, 2013; Acuna and Juana, 2025; Tang et al., 2022).

Vibhakta-Avadhana: Divided Attention Management

Continuing this concentration, vibhaktaavadhana (divided or distributed attention) develops the learners' ability to handle the multiple processing requirements of actual listening. This mode contrasts with the selective focus of ekagraavadhana: a speaker who uses this mode forms simultaneous awareness of the multidimensionality of speech, i.e., the ability to follow multiple streams without losing a single thread. The first part of the training focuses on dual attention, i.e., listening and following the content and emotional tone, as well as explicit and implicit meanings. Similar to the conventional progression of ekavadhanama to dviavadhana, it is initially challenging for learners, yet capacity can be developed through practice (Diamond and Ling, 2020). Over time, the workload grows to three or four dimensions, following content, discourse organization, unfamiliar vocabulary, accuracy of comprehension, question, background knowledge, and credibility of the speaker, moving towards ashtaavadhana such complexity, combining streams of phonological, lexical, syntactic, semantic, pragmatic, discourse, attitudinal, and metacognitive attention.

Importantly, vibhaktaavadhana focuses on maintaining quality across streams (not multitasking, which is superficial) and encourages true parallel processing in which streams enlighten each other (e.g., stress patterns to aid discourse comprehension and inference). The scaffolded activities rely on planned outlinings that encourage the consideration of primary ideas, supporting points, and personal relationships, and as the capacity increases, external help is generated, evaluation changes to what was learned to how well students can report on various dimensions, which is an indicator of successful divided attention (Goh & Vandergrift, 2021).

Chala-Avadhana: Flexible Attention Switching

True listening involves not just a long period of attention and divided attention, but also a switch in attention in case of a breakdown in understanding, when priorities shift, or when unforeseen information arises. This adaptive dimension is addressed through chalaavadhana (flexible or dynamic attention). The attentional flexibility of traditional avadhana practitioners is remarkable: they move between tasks without mental slowdown, driven by metacognitive control rather than a strong focus.

The attention management strategies are explicitly built up through chalaavadhana training. The learners become aware of the breakdown in comprehension and redirect it accordingly: they zoom in on the particular linguistic characteristics to help them see the important information they are missing or zoom out to the discourse-level to be able to see the forest instead of the trees, or they can concentrate on inferring, skipping, and processing unfamiliar words. Activities are designed to mimic real-life struggles, such as rich technical terms, fast speech, and complicated syntax, and to instruct in adaptable reactions rather than scaffolding the content. Then, after listening, learners compare which strategy was most successful, thereby fostering strategic flexibility (Siegel, 2024). Training, too, is counteracting affective interference like anxiety-triggered attention tunneling. Students rehearse detachment from obsession with misconceived passages and shift the focus in a new direction. They then move to metacognitive awareness when they become frustrated, and they monitor their cognitive and affective situation before switching to strategic refocusing (Gregersen and MacIntyre, 2016).

Sthira-Avadhana: Sustained Attentional Endurance The fourth dimension deals with attentional stamina- the ability to sustain quality attention during a long duration. A conventional performance of avadhana may take several hours, during which the avadhani must be able to withstand cognitive demands throughout the performance, as he or she must control many streams of information without impairment. Correspondingly, real EFL listening during lectures, meetings, or long conversations requires prolonged attention, which is way more than the usual classroom activities of three to five minutes. Sthiraavadhana (steady or stable attention) training gradually increases the duration one can sustain attention without compromising its quality. Starting with ten-minute tasks, teaching progresses slowly towards twenty, thirty, or more minutes. Sthiraavadhana is in contrast to extensive listening and has strict standards of attention, where students, for example, follow a 30-minute podcast or a document in detail and record notes to show, over time, that the quality remains high. Cognitive fatigue should also be managed in attentional endurance. Brief attention resets, such as mindful breaths (30 seconds), small movements, or reflection, are part of training, just as in long avadhana performances (Seufert, 2020; Sweller, 2011). Progressive loading is similar to athletic training: sessions of 15 minutes at the beginning of the semester are increased to 30-minute sessions in the middle of the semester and 60-minute sessions at the end of the semester, and learners have to record fatigue points and effective endurance strategies in their journals.

PEDAGOGICAL IMPLEMENTATION

Curriculum Design Principles

An avadhana-based program of listening takes a curriculum that emphasizes advances in attentional development as the main principle to be rethought in terms of course structure, rather than emphasizing linguistic complexity or subject matter. A semester course has four macrophases, each attached to a dimension of avadhana. The first step focuses on ekagra-avadhana, in which the initial concentration is developed through single-focused listening exercises on various attentional objects. The second stage presents vibhakta-avadhana, which is an orderly progression of two or more simultaneous streams of attention. The third stage is the acquisition of chala-avadhana skills, including training in strategic attention switching. The last stage unifies the learning with sthira-avadhana, which prolongs the attentional span as the new dimensions are incorporated. Notably, these stages do not follow up on one another but overlap. Students continue to practice focused concentration under divided attention. High-achievers who train sustained endurance also train attention switching. This spiral curriculum reflects the traditional avadhana training, in which students perfect all dimensions of attentiveness rather than learning one and then advancing to the next. The choice of materials emphasizes attentional difficulty more than language simplification. Authentic materials with natural speech rates, authentic communication purposes, and complexity in a real-life environment are appropriate training environments (Newton and Nation, 2021). Nevertheless, the choice of materials is strategic to highlight particular attentional needs. Texts of abundant prosodic variation, intricate discourse form, or other special pragmatic characteristics can serve as targets in the case of ekagra-avadhana training. To create divided-attention demands, use materials containing more than one information stream at once, as in an interview with a speaker overlapping others, a story with flashbacks, or a description with examples.

The practice of assessment is consistent with the goals of attentional development. Instead of just testing comprehension, the tests are designed to test attentional capabilities. Learners are observed to exhibit ekagra-avadhana when they give detailed reports of what they have observed after prolonged concentration on specific features. They have parallel processing across several dimensions, which indicates vibhakta-avadhana. Chala-avadhana tests present problematic listening situations that require strategic attention. Sthira-avadhana tests are long-term listening tests that maintain documentation quality (Goh & Vandergrift, 2021).

Classroom Activities and Strategies

Each avadhana dimension is operationalized through concrete classroom activities. The activities of Ekagra-avadhana include a phonological treasure hunt; in this case, students listen to long texts and note all occurrences of specific phonemes or stress patterns. Prosody-mapping tasks map intonational contours without considering semantic information. Discourse marker tracking focuses on transitional phrases, logical connectors, and indicators of exemplification across a whole lecture. Emotion tracking specifically examines changes in affective tones during conversations or other narratives.

The activities of vibhakta-avadhana organize simultaneous attention along dimensions. Dual-coding tasks involve the ability to draw pictures of what is being said while thinking it through. Triple-tracking worksheets encourage simultaneous focus on principal thoughts, evidence, and personal reactions in the academic lectures. Multi-party conversations are managed using quadruple attention matrices that keep track of who said what, when, why, and the implications in a conversation. In complex listening, Advanced learners use the octuple attention dashboards to monitor eight dimensions of information at once.

Problem-based listening situations are used in chala-avadhana training. The first task the students encounter is the difficulty in text that intensifies halfway through the topic, the contradictory information, or the information that is hard to comprehend, and afterward, they are drilled in the switch-response strategy of attention management. Attention strategy laboratories are toolkit collections of switching strategies that learners are trained to apply in a single situation. Metacognitive debriefing after challenging listening tasks directly examines the when and how of learners' and judges' attention shifts, and assesses the strategic effectiveness.

Sthira-avadhana progression is associated with prolonged marathons on listening exercises with a structured attention maintenance. The monthly endurance listening programs consist of sixty to ninety minutes of sustained listening sessions with periodic attention quality check interventions. The learners keep close listening records showing the sustained attention levels. Attention renewal workshops teach strategies for breaking, cognitive reset techniques, and stamina-building.

Avadhana training is a natural combination of mindfulness and reflective practices, which enhance attentional control. Traditional adittha practitioners take time to meditate to develop the psychological steadiness underlying their mindfulness. Similarly, EFL listening classes can include short mindfulness exercises that support attentional growth. Attention is placed on daily meditation, which is practiced at the very beginning of each lesson. A five-to ten-minute yoga meditation that involves breathing makes the person conscious of the moment and prevents the mind from wandering. The meditations of body-scan foster somatic awareness, which enhances holistic listening. The loving-kindness intervention will decrease anxiety and self-accusation, which are distracters of attention (Gregersen and MacIntyre, 2016; Tang et al., 2022).

There are the practices of contemplative listening that mediate between the process of meditation and the learning of language. Silent listening is the art of listening to a speech in a meditative quality, without either breaking it down or judging it. Listening pauses provide digestive and integrative moments between the sections of listening. The results of experimental research on mindfulness-based language learning have significant benefits, such as reduced listening anxiety, improved concentration, and enhanced comprehension (Acuna and Juana, 2025). Combining mindfulness with the principles of avadhana yields a synergistic interaction, since both traditions focus on metacognitive awareness, the absence of judgmental observation, and the cultivation of attention.

Teacher Learning and Continuous Improvement

Those teachers who apply avadhana-based listening pedagogy must also develop their attention on the personal level in addition to the pedagogical training. Personal practice of avadhana should be included in professional development courses so that teachers can experience the framework they teach. Teachers would participate in intensive concentration, divided-attention training, and marathons of sustained listening, and learn the difficulties and lessons that guide them in teaching.

The cognitive richness of traditional avadhana practice is promoted through reading traditional texts, watching videos of contemporary performances, and potentially being guided in the practice of avadhana. Teachers examine the tradition of teaching approaches, cognitive architecture, and training methodologies. Scientific frameworks to augment traditional knowledge include models of attention management strategies, cognitive load theory, and studies of working memory (Seufert, 2020).

The avadhana-based practice of teaching with peer feedback constitutes the examination of pedagogical competence in stimulating attentional training. The teachers are instructed on how to build progression chains, provide appropriate levels of difficulty, promote divided attention, and assess attention skills. The continuation of professional learning communities gives teachers a chance to share experiences, troubleshoot, and collectively polish avadhana-based pedagogy.

DISCUSSION

Addressing Contemporary Challenges in EFL Listening

The avadhana framework directly addresses some ongoing issues in the teaching of EFL listening. First, it reacts to the attention management challenges that hinder comprehension. Instead of viewing attention as a given capacity that must be accommodated, avadhana views attention as trainable and offers systemic ways to increase capacity by systematically increasing the challenge. Evidence of cognitive training underpins attentional plasticity; that is, well-structured training can benefit attentional control (Diamond and Ling, 2020; Tang and Posner, 2009; Tang et al., 2022).

Second, avadhana addresses the cognitive congestion that beginner listeners experience when exposed to genuine speech. The attentional architecture that supports the multi-processing needs of attention is developed by systematically progressing from intense to divided to flexible attention among learners. This mode of development is opposed to the immersion strategies that subject learners to intricate attention requirements without any formal preparation (Newton and Nation, 2021).

Third, the framework increases metacognition in the attention processes. Conventional methods seldom bring attention to the forefront of learners. The training at Avadhana specifically teaches attention monitoring, tactical positioning, and manageability. This aspect of metacognition is consistent with studies that found metacognition to be a differentiator between good and poor listeners (Goh, 2008; Goh and Vandergrift, 2021).

Fourth, avadhana is an intrinsic motivational factor of mastery experiences. The

gradual task and the observable growth in attentional ability result in satisfaction equivalent to that of training in athletics or music. Students will physically develop their concentration, multitasking, and endurance, thereby promoting self-efficacy and further participation (Zhu and Wang, 2025).

Cognitive Science Perspectives on Avadhana

Modern cognitive science provides principles for understanding the efficacy of avadhana. Empirical evidence of working memory has demonstrated that attentional control and executive functions are trainable (Diamond and Ling, 2020; Jaeggi et al., 2008; Karbach and Unger, 2014). Avadhana, in turn, involves extreme training of working memory in language-specific contexts, resulting in domain-specific as well as general cognitive improvements in listening. The research distinguishes between selective, divided, and sustained attention as distinct highlighting capacities (Petersen and Posner, 2012; Posner and Rothbart, 2007). The four dimensions of Avadhana correspond to the following constructs: ekagra-avadhana is training selective attention; vibhakta-avadhana is training divided attention; chala-avadhana is training attention switching (associated with executive control); and sthira-avadhana is training sustained attention. According to this correlation, the entire attention system is covered by avadhana. Aviation, that is explicated by cognitive load theory, is the progressive structure of avadhana. The first process is the isolating of attentional dimensions, which is training, and this way, the intrinsic cognitive load is kept in check. Further integration enables the gradual construction of a complex schema to address complex attentional requirements. The framework does not overload the mind and takes a systematic approach to the complexity of authentic listening (Seufert, 2020; Sweller, 2011).

Studies of neuroplasticity suggest that, through vigorous attention training, neural changes can occur that positively influence performance. It has been found that meditation training that enhances attention control is linked to structural and functional modification of attention networks (Malinowski, 2013; Tang and Posner, 2009; Tang et al., 2022). The training of Avadhana, which involves intensive attention and metacognitive reflection, can also sustain neuroplastic change.

Cultural Considerations and Contextual Adaptation

Although avadhana has roots in Indian cultural contexts, it should be culturally responsive to be applied. The historical relations of the practice to Sanskrit literary performance and its roots in Hindu philosophical traditions of concentration practices, the issue of cultural appropriation and religious imposition come up. Many considerations will ethically ensure inclusion in implementation.

To begin with, the avadhana needs to be presented as a mental training technique instead of a cultural or religious one. Despite attributing origins, pedagogy is concerned with general mental principles of attention management. This secularization is similar to the way in which mindfulness-based stress reduction modifies Buddhist meditation to clinical settings that do not have religious demands (Malinowski, 2013). Second, teachers should place avadhana within the broader context of attention research and relate it to cognitive science,

educational psychology, and modern learning theory. This is an intermediate between the traditional and scientific models that demonstrates convergent validity across all knowledge systems and serves a diverse range of epistemologically oriented learners.

Third, it must be culture-receptive and adapt specific practices to local educational values. In collectivist cultures, vibhakta-avadhana may focus on joint attention control through listening to a group. Integration with local meditative traditions benefits the framework, given that the contemplative practice is esteemed. The neuroscientific explanations might dominate in secular scholarly settings.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

As a conceptual model, the avadhana-based model must be empirically validated through systematic research. Are there any differences in avadhana-based training and the conventional methods when it comes to the results of listening comprehension? The use of standardized tests would help provide this comparison of the accuracy with which comprehension, retention, and transfer were carried out in the quasi-experimental research.

What is the phenomenological experience of avadhana training of learners? A qualitative design can be applied, based on interviews and phenomenological analysis, to research subjective experiences, perceived benefits, and motivational impact, and it is applicable to enhance pedagogy (Sharif et al., 2024). What is the best set-up of progression? Design-based research could assist in testing the sequence of progression, the difficulty of the challenge, and when different proficiency levels would be integrated in a cyclic process, creating an evidence-based developmental trajectory.

Is there a transfer effect of avadhana training beyond listening comprehension? Longitudinal studies could examine possible effects on other language abilities, academic achievement, or more general cognitive abilities. What is the moderating effect of individual differences? Studies on working memory, attention regulation, and anxiety could identify factors that predict responsiveness and, therefore, allow individualized practice.

Lastly, neuroimaging findings may bring neural processes behind attention enhancement in line with traditional practice and neuroscience (Tang et al., 2022), and research on adaptive platforms, virtual reality, and mobile interventions may determine effective digital application and research constraints of technology-mediated attention training (Nazarieh, 2025; Zhu and Wang, 2025).

CONCLUSION

This paper suggests modifying avadhana, the ancient Indian method of multidimensional attention in full concentration, as a pedagogical model in teaching EFL listening. It addresses key gaps in modern listening pedagogy, which treat attention superficially even though it constitutes the core of the comprehension process. The system provides practical training techniques, including isolated-feature concentration, progressive multidimensional attention-building, and extended endurance development, and also makes

theoretical contributions by reconceptualizing listening as advanced attentional orchestration, trainable via progressive challenging, and by reconciling ancient Indian mental practices with modern cognitive science.

The avadhana tradition demonstrates that unique attentional skills can be carefully developed through intensive training and the principles of progressive development, metacognition regulation, strategic distribution, and the maintenance of practice directly relevant to listening in EFL. This teaching approach views attention not as a limited resource, but as something that can be improved through practice. It is not merely a matter of telling students to focus, but rather of using certain activities to build various elements of attention. This method will be effective in modern language teaching, but this will be decided by future research. This research should include studies examining how students experience it and how the brain works during the process.

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SOCIO-CULTURAL AND EDUCATIONAL SCENARIO OF LODHA PEOPLE AT BELPAHARI, JHARGRAM DISTRICT, WEST BENGAL

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ABSTRACT

Among different types of scheduled tribes community, Lodhas are known as Primitive Vulnerable Tribal Groups (PVTGs) and till date they are known as criminals. In Medinipur (East and West) and Jhargram District, a good number of Lodha tribes are living. Sometimes they live with other tribes as well as the higher castes peoples also. They showed primitive life style in social structure and cultural scenario. Lodhas are culturally, economically and educationally most backward among other different types of tribes. They cannot understand the need of formal education in their life. To them education is just ornamental and therefore, they do not feel any need for education. Further in-depth longitudinal study and support from the Government are essential.

Keywords: Social Structure, Cultural Environment, Educational Development, Lodha Community.

INTRODUCTION

Lodha, an identified Primitive Vulnerable Tribal Groups (PVTG) is recognised as one of the most socio-economically disadvantaged tribal groups in West Bengal, Odisha, Jharkhand and other States. Lodha people claim their ancestry from the Savara tribes. Both the Lodhas and Savaras tribes are notorious for their criminal propensity and, therefore, since the British period or even more early days they were designated as criminals (Ota & Sahoo, 2010). It is because historically they lead an unusual social behaviour and unaccepted profession. Therefore, in West Bengal as well as in Odisha they were looked down upon with suspicion and aversion.

During the British period in 1916 the Lodha people were notified by the then Government as the criminal (Government Notification, No. 7022-23, dated 28th May, 1916, Calcutta). In another notification (Memo No. 1560-1561, Dated 16th March, 1928) it was laid down that, "any Lodha on his first conviction under non-bailable offences and under section 109/110 of the criminal procedure code should be treated as a registered member under the Criminal Tribal Act." After Independence in 1952 the law of 1928 was eventually repealed and in a new law the Lodha people became equal with every other citizen of India. Even today due to the social stigma remained the common people as well as the police still believe that Lodha people are always law breakers and always they are criminals.

They possess this helpless condition because of their unfortunate social distancing with the common people as well as other ethno-cultural groups, who are their neighbours see them in a suspicious eye. After Independence, the Govt. of India declared them as a Primitive Vulnerable Tribal Groups and 'micro project has been set up for their socio-economic development and welfare'. Therefore, to integrate them into the general social fabric, government took efforts to develop their community relationship with other tribes from Mundari groups.

In West Bengal the Lodha tribes are predominantly concentrated in the Districts like Jhargram, Paschim Medinipur, Purba Medinipur and other Jungle Mahal Districts. According to 2001 Census Report, the total Lodha population in West Bengal was 84,966. In 2011 Census Report it's number increased to 108707. Out of these total Lodha population 54692 were males and 54015 were females. The Lodha people, in West Bengal are concentrated in Nayayangarh, Gopiballavpur, Radhanagar, Keshiyari, Sabang, Debra, Belpahari and Binpur etc. Everywhere their settlements are very close to forests where there is an availability of adequate supply of sweet water throughout the year. Though they live in multi caste and multi tribal villages, they remain in isolation from other communities and tribes. They prefer to live in the forests where Sal, Mahua, Segun, Piasal, Kendu, Bel, Haritaki, Bahera plants as well as varieties of herbal plants are available. Because of this, herbal plants are most useful in their day-to-day life to protect their health.

The Lodha people were not sufficiently studied by the researchers. Only the Social and Physical anthropologists studied in-depth about the Lodha tribes. Therefore, sufficient research publications were either not available or not found by the present researchers even after a long review of related literatures. Ota and Sahoo (2010) studied the Lodha tribes in Odisha. Hansda (2018) studied the socio-culture of Lodha tribes in Odisha with special reference to Morada and Suliapada block of Mayurbhanj District. Mishra and Bhunia (2024) studied Lodha tribes in West Bengal, their challenges, struggles and strengths. Panda (2014) studied Lodha tribes of Paschim Medinipur particularly about their educational scenario. Biswas (2024) studied socio-economic conditions of the Lodha community in West Bengal. Panda and Panda (Date not found) studied livelihood strategies of Lodha women from Paschim Medinipur District. Chakraborty and Joshi (DNF) studied educational landscapes of Lodha tribes in Paschim Medinipur District. Maximum research about Lodha tribes in West Bengal were done by Bhowmick (1963, 1966, 1981), and by Mahasweta Devi (1983, 1985, 1992). According to Mahasweta Devi (1983) Lodhas suffer from accute poverty and marginalization. This is one of the most backward Communities and for their livelihood depends fully upon forest resources, hunting and in very little cases on some agricultural and non-agricultural activities. Now they are wage labourer.

OBJECTIVES OF THE STUDY

1. To study the socio-cultural scenario of Lodha tribes in West Bengal.
2. To analyse educational conditions of Lodha tribes in West Bengal.

METHODOLOGY

For this study, the researchers collected data from the Kankrajhore areas of Belpahari Block, Jhargram District. The primary data for this research study have been collected following the anthropological field work for about three consecutive months. For data collection the first author of the study almost regularly visited the Lodha villages of Kankrajhore and cordially interacted with them. He developed a positive relationship with the Lodha tribes, so that, they could believe him. It is because the Lodha tribes did not express themselves to any other people than their own community. During their regular visit to the field they also took biscuits, chocolate, snacks and sweets for their little children as well as for the Lodha women for creating a good rapport with them. The authors designed the research methodology and prepared the data collection tools for this anthropological study. For data collection the researchers proceed in qualitative analysis techniques like semi-structured questionnaire and focus group discussion (FGD).

FINDINGS AND DISCUSSIONS

i) From socio-cultural aspect it was noted that the Lodha people respect their unique socio-cultural identity. In their social hierarchy the religious head is 'Dehuri' who possess a magical power and conduct all the rituals for community level festivals and ceremonies. His disciples were trained by him about the worship of God and Goddess as well as the holy spirit. He also taught them about procedures of sacrificing the fowles, cocks, and goats. To the Lodha community elephants were accepted as the important village deities irrespective of socio-economic status. Lodhas shows due respect to the 'Dehuri'.

The Lodha community organise their traditional village council underneath a large tree. They seat on the grass or dry leaves of the plants. Generally during sunset the village traditional council were met to reach in a decision.

Lodha tribes prefer singing and dancing with Dhamsa-Madal and Dhole. In the different occasions Lodha villagers dance on a suitable place. For boys and girls every village has a playground. The cremation ground is located in the bushy jungle.

The hut of Lodha families arranged in an irregular fashion having two rooms but without any windows. In most rooms doors are not present, because they believe that they have no resources that can be theft by others. Walls of the hut are made up of mud. Bamboo and wood were collected from the jungle. The living areas are rectangular in size. The walls are pested by mud and cowdung. On the roof of the hut there are straws or leaves of the palm trees. Sometimes they use local made clay tile named as 'Khapper' on the roof of the huts. Only a few utensils for cooking and taking food are present in the Lodha families.

They did not believe in divorce. Lodha people strictly prohibited marriage within the clan or gotro. Lodhas have nine clans like Bhakta, Mallick, Nayek, Kotal, Dandapat, Parmanik, Digar, Bhunia and Aris Ahari. Each clan has one totem. The Lodha clan is a patrilineal unit.

By nature Lodha peoples prefer to eat fish and meat. They collect fish from the river

and meat by hunting from the jungles as well as from their pets. Most of the Lodha tribes are too poor to collect two full plates of lunch and dinner. They prepared non-spicy food may be due to their poverty.

Lodha families may be nuclear or extended depending upon the number of family members present and their economic cooperation. In every family father is the head and he allots specific duties to the family members. After father is expired, widow mother or elder brother managed the family affair. After the death of any of their family members, the Lodha people asked co-villagers to participate in the funeral programmes. Marriage of Lodha boys takes place between 20 to 25 years age and that for the Lodha girls; the age of marriage is 16 to 20 years. In every marriage there is an important role of mediator and Dehuri. Bride price is practiced and usually it consists of three clothes, a saree for the mother of the bride, a dhoti for the maternal uncle, and a dhoti for the eldest brother-in-law. The bride price is accepted by the mother. During the wedding ceremony a series of rituals were followed. Widows can re-marriage without any problem or permission from others. The God and Goddess of Lodha people are 'Vogoban' (The supreme God), 'Basumata' (Mother earth), 'Sitala' (A chief deity and worshiped more than once in a year with a special sacrifice) and 'Chandi'. They perform their main religious ceremonies in Makar Sankranti and Chait Sankranti. They have conception about heaven, soul and evil spirits. In 'Chandi' and 'Sitala' than they offered horses and elephants made by the mud. Some of their festivals are held on fixed dates and some observed according to their socio-economic convenience.

ii) The educational status of the Lodha tribes are too poor even in the 21st century. Most of the Lodha tribal people are illiterate. Illiteracy, poverty, unemployment and starvation are their ornaments in life. Due to their poverty they cannot send their sons and daughters to the schools and if they are gone, only to take a mid daymeal. Due to severe poverty both the husband and wife of the Lodha family entered the dense forest for collection of Sal and Kendu leaves, Sabui grass, mushrooms (seasonal), fodder, fuel wood, honey, amlaki and haritaki seeds, medicinal herbs, sal seeds, scented dhuna from the resin of sal plants and soda soil etc. as their livelihood. The true picture is that both the Lodha husband and wife started to walk in early morning to the forest and returned during the sunset. In the meantime, their sons and daughters played the duty of grazing the cows and goats, nurturing younger brothers and sisters as well as cultivating hens etc. In most cases primary schools situated far away where reaching the younger boys and girls is not an easy task. Because they have to walk through the forest where they may be attacked by ferocious animals. The Lodhas did not know the importance of education in their life. In the family there is nobody to guide the learners academically. Even the teachers in the schools showed a stigma about their education. The teachers never care about their education. In the curriculum there are no reflections of Lodha people's culture, life style or religious faith. Therefore, they did not understand the importance of their education. Also most of the teachers are from non-tribal class, therefore, they are unable to follow the positive and negative aspects of tribal life. The Lodha children in schools were neglected by their peers as well as by their teachers. Therefore, education for the Lodha children is just ornamental which have no implications in their daily life. In most of the primary schools a sufficient number of scheduled tribe teachers are not available, neither the

teachers from other castes did not have any experience to teach the Lodha children. The teachers in the schools do not know the socio-cultural as well as the economic conditions of the Lodhas. They did not have any interest about the Lodha community and how to retain the Lodha children in the schools. Merely retaining the Lodha children in the school is not sufficient, they have to develop a minimum level of quality achievement for these groups of learners. Parental involvement or parental participations of Lodha parents are fully neglected in the schools. Therefore, Lodha parents have no idea about their sons and daughters education.

CONCLUSION

The socio-cultural conditions of Lodha people remain in challenging conditions not only in West Bengal but also in adjacent States like Odisha and Jharkhand. All the Lodha people remain in severe poverty, poor health conditions, poor educational attainment and inadequate living conditions. Socially they are excluded from the mainstream society as well as from other tribal communities. Their economic conditions are too poor and they have limited access to essential resources from the forest. For generations after generations they suffer from a low literacy rate, most specifically among the women. The result is that they cannot engage themselves in any formal employment due to lack of literacy. The health conditions of the Lodha tribes are too poor, possess high rates of malnutrition, infant and maternal mortality rate increase and limited health care facilities. In Lodha villagers there is poor sanitation, inadequate drinking water and limited electrification which makes their quality of life in risk. They also face cultural challenges and social exclusion. They cannot practice their traditional culture because of the threat of Globalization and Westernization. Their social inclusion hampered regularly and their cultural programmes were not respectfully obeyed by others from higher castes. They possess very primitive types of skills for earning their livelihood. We must promote the Lodha peoples socio-cultural identities, their indigenous knowledge systems and their knowledge about medicinal plants. Holistic approaches are needed for developmental planning and their implementation.

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EFFECT OF OCCUPATIONAL STRESS ON JOB SATISFACTION IN HIGHER EDUCATION IN BANGLADESH: A CROSS-SECTIONAL STUDY

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ABSTRACT

The main goal of the current study was to examine the association between occupational stress and job satisfaction among university faculty members in Bangladesh. A cross-sectional survey methodology was used. An online questionnaire was implemented to collect data from 252 faculty members at public universities. The questionnaire comprised demographic and Bangla-adapted self-report tools. Data were analyzed using SPSS version-25. Descriptive statistics, Pearson correlation, independent sample t-test, one-way ANOVA, and multiple regression analyses were conducted. The results demonstrated a significant negative relationship between job satisfaction and occupational stress, indicating that greater occupational stress is associated with lower job satisfaction. However, neither occupational stress nor job satisfaction showed any gender differences. According to the ANOVA test, occupational stress varied significantly by job rank, tenure, age, and marital status, whereas job satisfaction was significantly varied by only marital status and age. In regression analysis, occupational stress significantly predicted job satisfaction, while all other demographic variables failed to provide significant predictive power. The principal conclusion is that occupational stress predominantly influences job satisfaction among university teachers in Bangladesh. Consequently, institutional methods must be formulated to mitigate stress while enhancing faculty members' well-being.

Keywords: University Faculty Members, Job Satisfaction, Occupational Stress.

INTRODUCTION

Background

Job satisfaction and occupational stress are two well-known contributing factors that affect employees' well-being, work functioning, and organizational effectiveness among the most discussed topics in the field of educational and organizational psychology (Madhavi

& Rao, 2023). In the global higher education landscape, university teachers are responsible for performing multiple complex roles such as teaching, research, and administration (Milon et al., 2024). The growing expansion of professional expectations, along with continuous pressure for academic performance and technological integration in modern educational contexts, generates extensive psychological stress on teachers, which may lead to higher occupational stress levels and lower job satisfaction.

Theoretical Framework

According to the transactional theory of stress, stress is a subjective process of appraisal in which people evaluate environmental demands on resources to be coped with (Lazarus & Folkman, 1984). Although stress is a normal part of any working environment, work-related stress arises when employment expectations exceed an individual's capacity to cope psychologically, emotionally, or physically. These conditions often lead to emotional strain (e.g., anxiety, fatigue, or irritability), which may reduce personal quality of life and professional functioning (Ganster & Rosen, 2013).

Factors Contributing to Job Stress and Job Satisfaction

In an academic context, occupational stress is influenced by numerous factors, including heavy teaching loads, research and publication demands, role ambiguity, time pressure, and lack of institutional resources. Such elements of stress connected to burnout, decreased job satisfaction, decreased teaching effectiveness, and greater turnover intent for faculty members (Cao et al., 2024; Xu & Wang, 2023). Extended periods of such demand may also negatively affect physical health and impair cognitive functioning, creative thinking, and relationships in the work environment, thus affecting not only individual performance but also institutional productivity as well (Hoque et al., 2023). On the contrary, job satisfaction stems from a positive psychological state arising from an individual's assessment of their responsibilities and workplace (Locke, 1976). Several elements contribute to job satisfaction, including remuneration, growth opportunities, recognition, peer support, and autonomy at the workplace (Spector, 1997). Other determinants, including work-life balance, institutional support, participative decision-making, and access to professional development opportunities, have been identified as contributing to teachers' satisfaction in higher education settings (Badaruddin et al., 2024; Westover, 2025).

The Connection Between Occupational Stress and Job Satisfaction

Teachers who are satisfied with their jobs tend to be more productive and show higher institutional commitment (Werang et al., 2017). This can lead to positive outcomes in teaching and student support within academic settings (Nicolas et al., 2024). In addition, psychological resources like emotional resilience and self-efficacy can further reinforce the positive effect of institutional support on job satisfaction, indicating the interactive nature of institutional and individual factors (Xu & Wang, 2023). Numerous research studies show an inverse relationship between job stress and job satisfaction. High workload, administrative burden, role conflict, and limited institutional resources and support increase stress and reduce satisfaction. The Demands-Resources (JD-R) model provides a proper explanation for this

relationship. According to this model, excessive job demands lead to stress and burnout, whereas significant resources (e.g., support, recognition, and autonomy) enhance an individual's job satisfaction and well-being (Demerouti et al., 2001).

Research Gaps

Despite the growing body of research, several gaps remain. Most of the existing research has focused on secondary and primary-level school teachers, with less attention given to higher education faculty members in both private and public universities, particularly in developing and non-Western countries like Bangladesh (Alam, 2019). Furthermore, prior research emphasizes on institutional factors, while overlooking individual psychological characteristics such as coping strategies and resilience that can significantly shape how individuals manage their occupational stress (Shatté et al., 2017). The lack of context-specific evidence limits the generalizability of findings to Bangladeshi universities as these institutions are currently undergoing rapid expansion and structural changes. Thus, these gaps illustrate the need to examine the association between occupational stress and job satisfaction among university teachers in Bangladesh. A clear understanding of these dynamics can help policymakers in formulating interventions to reduce stress, increase teachers' psychological well-being, and enhance institutional performance. According to these considerations, the present study aims to investigate the relationship between occupational stress and job satisfaction among university teachers in Bangladesh.

OBJECTIVES OF THE STUDY

General Objectives

To investigate the relationship between occupational stress and job satisfaction among university faculty members in Bangladesh

Specific Objectives

1. To examine the correlation between occupational stress and job satisfaction among university faculty members
2. To examine gender differences in occupational stress and job satisfaction among university faculty members
3. To assess the effect of demographic variables on occupational stress and job satisfaction among university faculty members
4. To assess how occupational stress predicts the variance in job satisfaction among university faculty members

METHODOLOGY

Participants

The participants were public university faculty members. Overall, 252 teachers responded to the online survey. In terms of age, 39.3% of the participants were aged below 35 years, while 48.4% and 12.3% were between the ages of 35-50 as well as above the age

of 50. According to gender, 39.7% were female and 60.3% were male. By faculty rank, 28.6% were professors, 23.4% were associate professors, 34.5% were assistant professors, and 13.5% were lecturers. With respect to professional tenure, 13.5% had 1-3 years, 26.2% had 4-8 years, 22.2% had 8-12 years, and the remaining 38.1% comprised more than 12 years of professional experience. Participants came from different academic faculties: Arts (12.3%), Social Science (20.2%), Business Administration (18.7%), Engineering (7.1%), Biological Science (20.2%), Science (16.7%), and other faculties (4.8%). According to their marital status, 86.1% were married, 10.7% were unmarried, and 3.2% were divorced. As for socioeconomic status, 89.7% belonged to the middle class, 7.9% to the upper class, and 2.4% to the lower class.

Measures

A demographic questionnaire was used to obtain personal and socioeconomic information. Demographic variables (e.g., gender, age, job rank, faculty affiliation, job tenure, marital status, and socioeconomic status) were included in the questionnaire.

Occupational Stress Index: Occupational stress was measured by the Occupational Stress Index (OSI), which was originally developed by Srivastva and Singh (2000). We used the Bangla version of OSI, which was adapted by Latif & Sultana (2009). It includes 46 items measuring different aspects of an individual's occupational stress (e.g., role ambiguity and overload). Participants rated their responses on a 5-point Likert scale from strongly disagree (1) to strongly agree (5). The OSI total score varies between 46 and 230, with higher levels corresponding to greater occupational stress. In our current study, the OSI showed excellent reliability (Cronbach's $\alpha = .91$).

Job Satisfaction Scale: Job satisfaction was measured by the Job Satisfaction Scale (JSS), which was originally developed by Warr et al. (1979). We used the Bangla version of JSS, which was adapted by Rahman (2003). It has 15 items measuring various facets of an individual's job satisfaction. Participants rated their responses on a 7-point Likert scale from extremely dissatisfied (1) to extremely satisfied (7). The JSI total score varies between 15 and 105, with higher levels corresponding to greater job satisfaction. In our current study, the JSI showed excellent reliability (Cronbach $\alpha = .91$).

Procedure

In this study, a cross-sectional research design was used. A purposive non-random sampling technique was utilized to collect data. Initially, the email addresses of almost 500 university faculty members who were directly involved in teaching were obtained from the institutional websites. Afterwards, we sent an invitation email to the potential participants describing the purposes of the study and inviting them to participate. In reply to our invitation mail, those who agreed to participate voluntarily were sent a second email containing a consent form and a link to the Google form questionnaire. Participants filled in the survey form after providing their consent. In the consent form, they were also informed that they could discontinue the questionnaire at any moment. To ensure anonymity and confidentiality, no personal information was collected.

Data Analysis

The survey data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 25. Descriptive statistics were computed to illustrate demographic and key study variables. Pearson correlation analysis conducted to examine the association between job stress and job satisfaction. One-way analysis of variance (ANOVA) and independent sample t-tests were conducted to evaluate demographic group differences. Finally, multiple regression analysis was performed to assess the predictive effects of our study variables. Statistical significance was set at $p < .05$.

RESULTS

Descriptive Statistics and Correlation

The distribution of job stress and job satisfaction scores were assessed for normality. Both variables fell within the acceptable range for skewness and kurtosis (-2 to +2), indicating an approximately normal distribution. The mean of job satisfaction was 67.32 (SD = 15.40), skewness = -0.743, and kurtosis = 0.247, while the mean of job stress was 136.73 (SD = 21.32), skewness = 0.309, and kurtosis = 0.013. A Pearson correlation analysis revealed a substantial and significant negative relationship between occupational stress and job satisfaction ($r = -0.73$, $p < .01$), meaning that a higher level of occupational stress was linked to a lower level of job satisfaction among university faculty members.

Gender Differences in Occupational Stress and Job Satisfaction

Gender differences were tested with independent samples *t*-tests (shown in Table 1). No significant gender differences were found in job satisfaction or occupational stress.

Table 1: Independent Samples *t*-test for Job Satisfaction and Job Stress by Gender

Variable	Gender	N	Mean	SD	<i>t</i>	df	<i>p</i>	Mean Difference	95% CI of Difference
Job Satisfaction	Female	100	68.63	13.99	1.10	250	0.273	2.18	-1.73 to 6.08
	Male	152	66.45	16.24					
Job Stress	Female	100	135.76	21.77	-0.58	250	0.561	-1.60	-7.02 to 3.81
	Male	152	137.36	21.07					

Occupational Stress Differences by Demographic Variables

The ANOVA revealed that several demographic variables had a significant effect on job stress (see Table 2). Marital status had a substantial effect on stress levels, indicating divorced participants reported higher levels of stress than unmarried and married participants. For job rank, there was a significant impact on stress levels, indicating that assistant professors reported the greatest levels of job stress compared to associate and full professors. Age and tenure also differed significantly, demonstrating that participants aged 35–50 years reported less stress than younger participants, and individuals with tenure ranging from 4 to 8 years

reported higher stress than those with greater than the median tenure (more than 12 years). Job stress did not differ significantly by socioeconomic status or faculty affiliation.

Table 2: Job Stress Across Demographic and Occupational Variables

Variable	Group	N	M $\pm$ SD	F	df	p	Significant Differences (Tukey HSD, $p < .05$)
Marital Status	Unmarried	27	143.89 $\pm$ 20.50	8.541	2,249	.000	Divorced > Married
	Married	217	134.89 $\pm$ 21.20				
	Divorced	8	162.25 $\pm$ 18.30				
Job Rank	Lecturer	34	134.32 $\pm$ 22.00	5.509	3,248	.001	Assistant Professor > Associate Professor; Assistant Professor > Professor
	Assistant Professor	87	143.95 $\pm$ 21.00				
	Associate Professor	59	133.53 $\pm$ 20.50				
	Professor	72	131.75 $\pm$ 21.30				
Tenure	1–3 years	34	134.21 $\pm$ 22.00	4.961	3, 248	.002	>12 years < 4–8 years
	4–8 years	66	144.38 $\pm$ 20.80				
	8–12 years	56	137.68 $\pm$ 21.10				
	>12 years	96	131.80 $\pm$ 20.50				
Age	<35 years	99	135.76 $\pm$ 21.77	5.134	2, 249	.007	35–50 years <<35 years
	35–50 years	122	137.00 $\pm$ 20.40				
	>50 years	31	138.00 $\pm$ 19.90				
SES	Lower Class	6	141.83 $\pm$ 18.20	0.376	2, 249	.687	None
	Middle Class	226	136.86 $\pm$ 21.00				
	Higher Class	20	133.70 $\pm$ 19.50				
Faculty	Arts	31	144.00 $\pm$ 21.50	1.421	6, 245	.207	None
	Social Science	51	136.55 $\pm$ 22.00				
	BBA	47	139.98 $\pm$ 20.50				
	Engineering	18	131.50 $\pm$ 20.20				
	Biological	51	133.47 $\pm$ 21.10				
	Science	42	133.17 $\pm$ 19.90				
	Others	12	140.08 $\pm$ 18.50				

Job Satisfaction Differences by Demographic Variables

Demographic and occupational variables in job satisfaction were assessed using a one-way analysis of variance (ANOVA; see Table 3). Marital status had a substantial effect on job satisfaction, revealing that married participants reported significantly higher job

satisfaction than both unmarried and divorced participants. Socio-economic status had a small effect ($p = .054$), indicating that respondents from more privileged socio-economic backgrounds reported a higher level of job satisfaction than those from lower socio-economic backgrounds. Job satisfaction was not significantly affected by age, job rank, tenure, or faculty affiliation.

Table 3: Job Satisfaction Across Demographic and Occupational Variables

Variable	Group	N	M $\pm$ SD	F	df	p	Significant Differences (Tukey HSD, $p < .05$)
Marital Status	Unmarried	27	60.81 $\pm$ 14.30	7.305	2,249	.001	Married > Unmarried; Married > Divorced*
	Married	217	68.67 $\pm$ 15.00				
	Divorced	8	52.50 $\pm$ 12.30				
SES	Lower Class	6	53.17 $\pm$ 10.85	2.962	2,249	.054	Higher Class > Lower Class
	Middle Class	226	67.43 $\pm$ 15.20				
	Higher Class	20	70.30 $\pm$ 14.00				
Age	<35 years	99	68.63 $\pm$ 13.99	3.262	2, 249	.040	None
	35–50 years	122	66.45 $\pm$ 16.24				
	>50 years	31	69.72 $\pm$ 14.30				
Job Rank	Lecturer	34	67.91 $\pm$ 15.48	1.292	3, 248	.278	None
	Assistant Professor	87	64.74 $\pm$ 15.27				
	Associate Professor	59	69.08 $\pm$ 14.95				
	Professor	72	68.71 $\pm$ 15.10				
Tenure	1–3 years	34	67.97 $\pm$ 16.21	1.046	3, 248	.373	None
	4–8 years	66	64.74 $\pm$ 15.27				
	8–12 years	56	67.00 $\pm$ 14.91				
	>12 years	96	69.04 $\pm$ 15.08				
Faculty	Arts	31	64.39 $\pm$ 14.80	0.848	6, 245	.534	None
	Social Science	51	65.63 $\pm$ 15.30				
	BBA	47	67.02 $\pm$ 15.10				
	Engineering	18	70.39 $\pm$ 14.50				
	Biological	51	69.96 $\pm$ 15.20				
	Science	42	68.52 $\pm$ 15.10				
	Others	12	63.17 $\pm$ 12.50				

Regression Analysis

A multiple regression analysis was conducted to examine the predictive effects of occupational stress and demographic variables on job satisfaction (see table 4). The results

showed that job stress emerged as the sole significant predictor of job satisfaction. This model explained 53.9% of the variance in job satisfaction, underscoring the importance of reducing occupational stress to improve job satisfaction among university faculty members.

Table 4: Predictors of Job Satisfaction

Predictor	N	M $\pm$ SD	B	Beta (β)	t	p
Occupational Stress	252	136.6 $\pm$ 21.9	-0.530	-0.734	-17.11	<.001
Age	252	33.8 $\pm$ 6.2	0.301	0.013	0.206	0.837
Sex	252	–	-2.176	-0.069	-1.098	0.273
Job Rank	252	–	1.062	0.071	1.130	0.260
Tenure (years)	252	5.7 $\pm$ 4.3	0.996	0.070	1.106	0.270
Faculty	252	–	0.652	0.077	1.226	0.221
Marital Status	252	–	1.699	0.040	0.639	0.524
Socio-economic Status	252	–	-5.731	-0.118	-1.879	0.061

DISCUSSION

This study examined the relationship between occupational stress and job satisfaction among university faculty members. The principal finding was a negative correlation between these two variables, indicating that university faculty members with higher job stress reported lower job satisfaction. This finding aligns with the existing literature. Xu and Wang (2023) found that teaching, research, and administrative stress adversely affected university teachers' well-being. Similarly, Kim et al. (2023) ascertained job stress as a main contributor to reduced job satisfaction among university teachers. In Bangladesh, Amin et al. (2020) found that academic stress reduced occupational commitment among university teachers.

In terms of gender difference, the study found no significant differences in both job stress and job satisfaction. This finding is consistent with Amos et al. (2015) reporting non-significant gender differences in job satisfaction among Ghanaian lecturers. However, some studies provide mixed evidence. For example, Webber and Rogers (2018) found that female faculty members reported job satisfaction levels similar to males in some areas, whereas their satisfaction level was lower than that of male faculty members in other areas.

Regarding group differences, job satisfaction significantly differed across marital status, whereas job stress was significantly different across age groups, job ranks, tenure, and marital status. These findings suggest that personal circumstances and career stages influence how academic work is experienced. These results align with Mgaiwa (2023), who reported differences in job satisfaction by academic rank and age among Tanzanian university academics. Another study also aligns with our findings, who found significant variation in occupational stress across age, rank, and teaching experience, with assistant professors experiencing higher stress than professors (Meng & Wang, 2018).

Finally, in the regression analysis, job stress was found to be a significant predictor of job satisfaction. This illustrates that job stress not only correlates with job satisfaction but

also plays a key role in predicting it among university teachers in Bangladesh. Overall, these findings suggest that higher job stress is associated with lower job satisfaction, emphasizing the importance of identifying occupational stress to improve well-being in academic settings.

Strengths of the Study

There are various strengths to this study. First, it addresses a critical yet reactively neglected issue in the context of higher education in Bangladesh. Second, participants were teachers from a wide variety of age ranges, ranks, and faculties, which increased the descriptive value of the findings. Third, the use of well-established Bangla-adapted instruments with excellent internal consistency further strengthened confidence in the measurement of core constructs. Therefore, using descriptive, correlational, group-comparison, and regression analyses enabled the study to better explain the association between occupational stress and job satisfaction.

Limitations of the Study

Despite its strengths, this study has several limitations. First, cross-sectional design limits cause-and-effect relations. Although job stress significantly predicted job satisfaction, the direction of this relationship can not be firmly established. Future studies should employ a longitudinal design to better understand the direction of the relationship between these two variables. Second, all measures were self-report based, which may have led to social desirability effects and common method bias. Future research should incorporate mixed-method approaches. Finally, data were collected through an email-distributed online survey using a purposive sampling technique, which may have resulted in self-selection bias and narrowed the representativeness of university teachers in Bangladesh. Future studies should apply probability sampling techniques (e.g., stratified or random sampling) and include multiple data collection methods to reduce self-selection bias and improve representativeness.

Recommendations

The findings provide multiple practical recommendations. First, institutions should reduce administrative burdens and ensure a more balanced workload among faculty members. Second, support systems should be introduced for teachers at different career stages. At this point, mentoring and career development programs may be beneficial. Second, improving leadership practices and strengthening collegial relationships may enhance job satisfaction among university teachers. Finally, universities may consider introducing counseling services, stress management workshops to promote teachers' psychological, social, and emotional well-being.

CONCLUSION

The study revealed that job stress was adversely correlated with job satisfaction among university teachers, indicating higher job stress is associated with lower job satisfaction. Universities need to view faculty stress as an institutional problem seriously. These findings highlight that faculty stress should be considered an important institutional concern. The findings of this study suggest that addressing occupational stress and increasing

institutional support are essential steps in promoting teachers' job satisfaction, increasing well-being, and ultimately contributing to higher education quality.

ACKNOWLEDGEMENT

The authors would like to express their sincere gratitude to every participant for their interest and voluntary participation.

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A STUDY ON THE RELATIONSHIP BETWEEN RELIGIOSITY AND SCIENTIFIC ATTITUDE OF THE HIGHER SECONDARY SCHOOL STUDENTS IN KALIMPONG DISTRICT

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ABSTRACT

The study investigates the relationship between Religiosity and the Scientific Attitude of higher secondary school students under the West Bengal Council of Higher Secondary Education (WBCHSE) in Kalimpong District. The study adopted a correlational descriptive field survey design. Data were collected from 420 students across a higher secondary school using a structured questionnaire adapted from the Centrality of Religiosity Scale (CRS) by Huber and Huber (2012) and the Scientific Attitude Scale by Khan and Siddiqui (2020). The study's findings indicated that there is a significant difference in Scientific Attitude based on gender, locale, and streams. Whereas, the difference in Religiosity which is counted in the study is only significant for the religion of the students and not with other categorical variables of the study. The analysis of the relationship between Religiosity and Scientific Attitude showed that these variables have negligible or very weak negative relationships. The study concluded that religiosity does not significantly shape the scientific attitudes of higher secondary students in the Kalimpong district. This emphasises the importance of encouraging scientific thinking as well as respect for the diversity of religious beliefs.

Keywords: Religiosity; Scientific Attitude; Higher Secondary School Students; WBCHSE.

INTRODUCTION

Scientific attitude and Religiosity are the constructs that influence school-level learners' engagement with knowledge and meaning. A scientific attitude in a student encompasses a strong desire to acquire knowledge and comprehension, characterised by questioning all assertions, seeking data and its implications, pursuing verification, and contemplating the consequences (Akçay et al., 2010). It is also essential to maintain an open-minded perspective, possess a genuine desire for accurate knowledge, and have confidence in the scientific method as a means of acquiring knowledge, while also assuming that solutions to problems will arise from the application of validated knowledge (Husain & Khan, 2024). Development of such a

mindset through observation, enquiry and reflection facilitates learners to comprehend and act like scientists, with deeper conceptual understanding (Mihardi et al., 2022). On the contrary, Religiosity refers to various aspects related to religious beliefs and participation (Bergan & McConatha, 2000), including organisational practices like attendance for worship and non-organisational activities like personal prayers or use of media for religious purposes (Purnell & Johnson, 2019). Moreover, religiosity can be defined as the degree to which individuals engage in religious practices, hold beliefs, and partake in spiritual experiences (Mangestuti & Aziz, 2023). It influences values, ethics, and community engagement. When investigating scientific attitude and religiosity among school students, it becomes crucial to understand the coexistence, interactions, or conflicts between evidence-based reasoning and faith-based views of the world in educational settings. This can help curricula and pedagogies better aim to nurture critical thinking and mutual respect for diverse belief systems.

The development of a scientific attitude also helps students to understand their daily life and makes them more assertive in decision-making. National educational policies like NEP 2020 have a constant focus on nurturing nation-building citizens right from the schools by developing their “scientific temper”. Meanwhile, many of the previous studies highlighted that an individual’s religiosity has the potential of negative influence in science, public health, well-being, and related areas. Teenagers explore various ideas, experience things, and have their own concept of the world. They are mainly influenced by their peers, teachers, or people whom they look up to. Simultaneously, many show resistance towards their family, specifically the belief system. Thus, altogether assessing the relationship between religiosity and scientific attitude is necessary among Higher Secondary students, as they have already developed the fundamental understanding of scientific knowledge.

Johnson et al. (2015) investigated how religiosity has affected various features of people’s relationship with science. This study points out that previous research considered science very broadly, but the authors highlighted distinct components like interest, knowledge, and confidence. This study used ‘structural equation modelling on 2008 survey data’, where they found that religiosity minimises people’s confidence in science but does not alleviate their interest in it. This suggests the reduced confidence may have come from spiritual concerns. Chan (2018) inspected religiosity’s relation to multiple views of science, which also comprises trust, knowledge, and social sides. This study found that religious people generally possess a negative attitude toward science; however, this may differ based on the country. The only consistent view across is that higher religiosity is linked to lower trust in the scientific foundation. In Western countries, religiosity showed a negative relation to science; countries with a majority of non-religious individuals showed more positive attitudes toward science. McPhetres and Zuckerman (2018) investigated general religiosity measured through beliefs and practices relating to science attitudes and knowledge. The study used large datasets and longitudinal data, and found that higher religiosity is related to higher negative attitudes toward science and minimises scientific literacy on topics like evolution. They also observed the influence of parental religiosity, which may also have affected children’s scientific knowledge. The study concluded that religiosity negatively impacts scientific attitudes and knowledge; however, the findings were based on U.S. data, which may vary according to different cultural contexts. McPhetres et al. (2021) examined whether the commonly

presupposed conflict between science and religion is universal or not. This investigation used data from the earlier 11 studies covering 61 countries. It analysed various measures of religiosity and attitudes toward science. The result revealed that religious Americans hold fewer positive views about science; this pattern was not seen in many other countries. The study concluded that the science and religion conflict is primarily considered a U.S.-specific phenomenon, but not a universal cultural truth. Laliotis et al. (2025) studied different levels and types of Religiosities that affect trust in science and public health behaviour during COVID-19. They used national survey data and municipality-level infection and vaccination statistics. They compared highly religious groups, such as Laestadians, with non-religious individuals. It showed that higher religiosity, specifically among conservative groups, was connected to lower trust in science, which leads to higher COVID-19 infection rates and lower vaccination rates. It concluded that religiosity remarkably shapes scientific attitudes and public health practices in Finland. Sekar (2013) carried out a study in Villianur, Puducherry, examining the differences in scientific attitude and reasoning skills among Class XII students. Established tests were utilised to measure reasoning and scientific attitude. The results revealed that boys and girls exhibited differences in reasoning ability in both the computer and biology groups, yet no significant differences were found in their scientific attitudes. Raja (2016) conducted a study in the Virudhunagar district of Tamil Nadu to explore the connection between gender, school type, and scientific attitude. The research applied a simple random sampling technique and involved statistical analysis. Results showed that secondary students generally possessed a high scientific attitude, with no differences found based on gender or type of school. The study proposed that effective science education, along with parental guidance, plays a crucial role in developing students' scientific attitudes. Trivedi and Agarwal (2016) found that planned science education is essential for the development of scientific attitudes to solve societal issues like poverty, illiteracy, and superstition. Science is not just for knowledge, but to inculcate rational thinking and evidence-based decision-making that leads individuals and societies on a progressive path. The study found a significant difference in self-efficacy between students with low and high scientific attitudes based on gender. Students with high scientific attitudes consistently showed higher self-efficacy. Revati and Meera (2017) examined whether science plays a vital role in shaping human understanding and solving real-life problems, especially in developing countries such as India. A scientific attitude, like curiosity, objectivity, and rationality, is usually overlooked during assessments that are important for fostering critical thinking and addressing societal challenges. The study revealed that scientific attitude did not differ according to gender, type of educational institution, or locale. Singh and Bai (2019) conducted research to determine if scientific attitude differs according to gender, school type, locality, and medium of instruction. Their results demonstrated that students generally possessed an average scientific attitude, with no significant gender differences identified. Nonetheless, the study revealed that scientific attitude did vary according to locality, type of school, and medium of instruction. Kundu (2018) performed a research study aimed at understanding the scientific attitudes present among secondary school students in the Alipurduar district of West Bengal, utilising stratified sampling techniques. The result showed that overall, students' scientific attitude was average and did not vary based on gender. Meanwhile, students in urban areas displayed a higher scientific attitude relative to rural students, and private school students attained higher scores

than those enrolled in government and government-aided schools. Bettaswamy and Sharath Kumar (2022) examined whether students' scientific attitude relates to their science achievement or not. It used a purposive sampling technique, an achievement test, and a scientific attitude scale. Researchers discovered the positive association between scientific attitude and science achievement; however, gender did not impact this association. Jena and Sangeeta (2024) researched the scientific attitudes exhibited by student teachers in the Khordha district, located in Odisha. It used a descriptive survey, stratified random sampling, and a standard scientific attitude scale. They found no significant difference in scientific attitude between male and female student teachers. Meanwhile, the scientific attitude varied significantly across different subject streams. The study highlighted the significance of science education in personal and national development.

RESEARCH OBJECTIVES

O₁: To study the religiosity of higher secondary school students by gender, locale, stream, and religion.

O₂: To study the Scientific Attitude of higher secondary school students by gender, locale, stream, and religion.

O₃: To examine the correlation between Religiosity and Scientific Attitude of higher secondary school students.

HYPOTHESES OF THE STUDY

HO_{1.1}: There is no significant difference between male and female students of higher secondary school regarding their Religiosity.

HO_{1.2}: There is no significant difference between urban and rural students of the higher secondary school regarding their Religiosity.

HO_{1.3}: There is no significant difference among Arts, Commerce, and Science students of higher secondary school regarding their Religiosity.

HO_{1.4}: There is no significant difference among Buddhist, Christian, Hindu, and Islamic students of higher secondary school regarding their Religiosity.

HO_{2.1}: There is no significant difference between male and female students of higher secondary school regarding their Scientific Attitude.

HO_{2.2}: There is no significant difference between urban and rural students of higher secondary school regarding their Scientific Attitude.

HO_{2.3}: There is no significant difference among Arts, Commerce, and Science students of higher secondary school regarding their Scientific Attitude.

HO_{2.4}: There is no significant difference among Buddhist, Christian, Hindu, and Islamic students of higher secondary school regarding their Scientific Attitude.

HO₃: There is no significant relationship between the Scientific Attitude and Religiosity of higher secondary school students in Kalimpong district.

RESEARCH METHODOLOGY

We collected our data using a descriptive survey study design. In order to accomplish the objectives of the study, a correlational research design was also used. Owing to time limitations, the study was confined to a quantitative research approach. Thus, the study can be described as a quantitative, correlational, and descriptive field survey.

Sample, Sampling Techniques and Variables

Using random selection techniques, 420 Higher Secondary school students from the Kalimpong district in the state of West Bengal represented the sample. The study took into account two key variables - religiosity and scientific attitude - as well as categorical variables, such as gender (male and female), location (rural and urban), and streams (arts, commerce, and science).

Tools

- The Centrality of Religiosity Scale (CRS) by Huber and Huber (2012).
- The Scientific Attitude Scale by Khan and Siddiqui (2020).

Normality Establishment

Table1: Descriptive Statistics of Religiosity and Scientific Attitude with respect to gender.

Gender		Statistic	Std. Error
Religiosity	Female	Mean	55.647
		Std. Deviation	10.036
		Skewness	-0.474
		Kurtosis	-0.374
	Male	Mean	54.027
		Std. Deviation	10.225
		Skewness	-0.306
		Kurtosis	-0.695
Scientific Attitude	Female	Mean	135.398
		Std. Deviation	9.595
		Skewness	.055
		Kurtosis	-.250
	Male	Mean	138.739
		Std. Deviation	10.212
		Skewness	.328
		Kurtosis	-.956

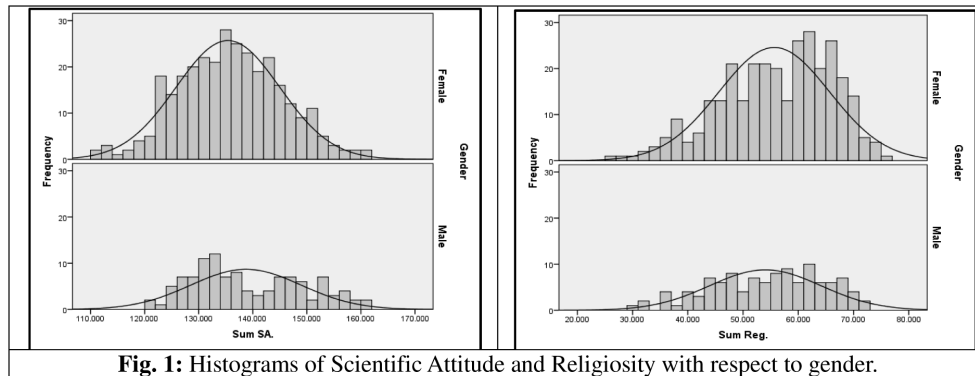


Fig. 1: Histograms of Scientific Attitude and Religiosity with respect to gender.

Table 2: Descriptive Statistics of Religiosity and Scientific Attitude with respect to locale.

LOCAL			STATISTIC	STD. ERROR
Religiosity	Rural	Mean	54.987	0.845
		Std. Deviation	10.692	-
		Skewness	-0.484	0.192
		Kurtosis	-0.413	0.381
	Urban	Mean	55.362	0.601
		Std. Deviation	9.687	-
		Skewness	-0.369	0.151
		Kurtosis	-0.590	0.301
Scientific Attitude	Rural	Mean	134.906	0.696
		Std. Deviation	8.905	-
		Skewness	-0.085	0.192
		Kurtosis	-0.299	0.381
	Urban	Mean	137.127	0.644
		Std. Deviation	10.384	-
		Skewness	0.183	0.151
		Kurtosis	-0.530	0.301

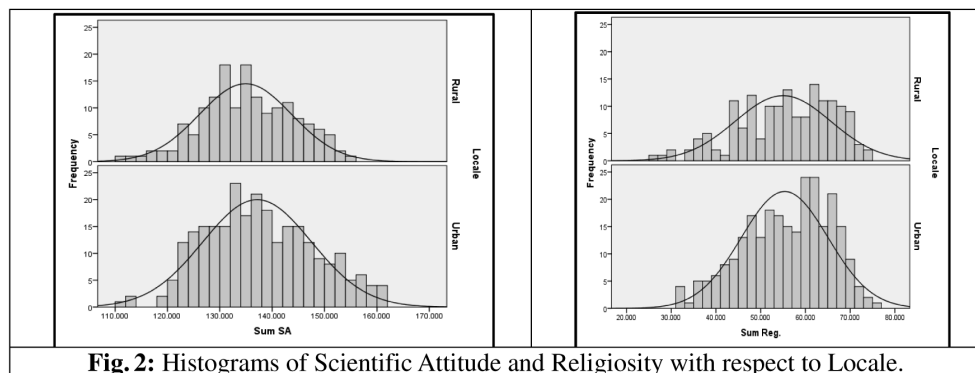


Fig. 2: Histograms of Scientific Attitude and Religiosity with respect to Locale.

Table 3: Descriptive Statistics of Religiosity and Scientific Attitude with respect to stream.

STREAMS			STATISTIC	STD. ERROR
Religiosity	Arts	Mean	55.227	0.733
		Std. Deviation	9.968	
		Skewness	-0.478	0.179
		Kurtosis	-0.423	0.355
	Commerce	Mean	55.480	0.766
		Std. Deviation	10.245	
		Skewness	-0.459	0.182
		Kurtosis	-0.397	0.361
	Science	Mean	54.357	1.332
		Std. Deviation	9.973	
		Skewness	-0.174	0.319
		Kurtosis	-0.788	0.628
Scientific Attitude	Arts	Mean	133.103	0.621
		Std. Deviation	8.444	
		Skewness	-.025	0.179
		Kurtosis	-.220	0.355
	Commerce	Mean	136.095	0.684
		Std. Deviation	9.149	
		Skewness	0.070	0.182
		Kurtosis	-0.479	0.361
	Science	Mean	147.375	1.133
		Std. Deviation	8.478	
		Skewness	-0.374	0.319
		Kurtosis	-0.588	0.628

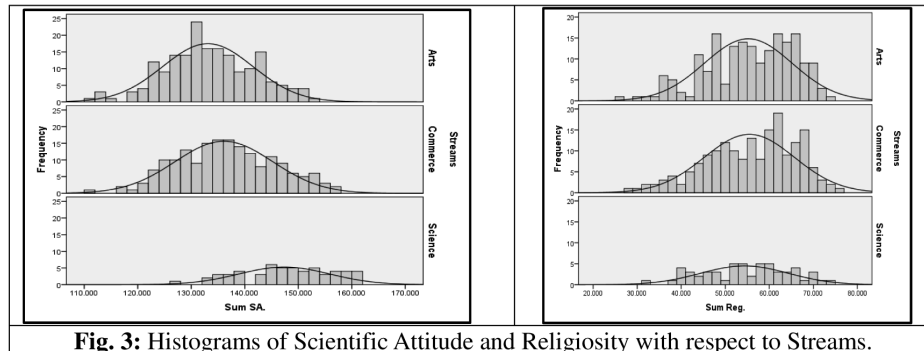


Table 4: Descriptive Statistics of Religiosity and Scientific Attitude with respect to religion.

RELIGION		STATISTIC	STD. ERROR
1. Religiosity	Buddhist	Mean	52.941
		Std. Deviation	10.297
		Skewness	-0.511
		Kurtosis	-0.163
	Christian	Mean	59.599
		Std. Deviation	8.824
		Skewness	-0.467
		Kurtosis	-0.617
	Hindu	Mean	54.074
		Std. Deviation	10.062
		Skewness	-0.329
		Kurtosis	-0.761
	Islamic	Mean	59.238
		Std. Deviation	7.930
		Skewness	-0.164
		Kurtosis	-0.537
2. Scientific Attitude	Buddhist	Mean	136.918
		Std. Deviation	9.781
		Skewness	0.013
		Kurtosis	-0.444
	Christian	Mean	137.000
		Std. Deviation	10.524
		Skewness	0.304
		Kurtosis	-0.582
	Hindu	Mean	136.131
		Std. Deviation	9.234
		Skewness	0.309
		Kurtosis	-0.345
	Islamic	Mean	132.429
		Std. Deviation	13.351
		Skewness	-0.141
		Kurtosis	-0.973

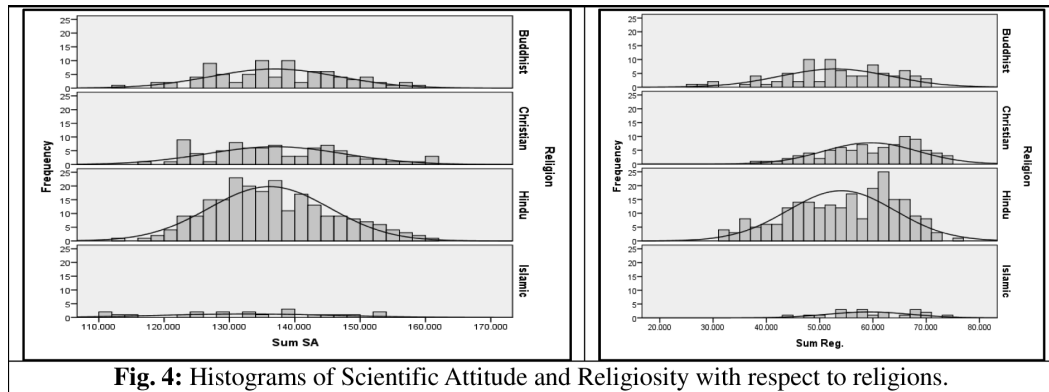


Fig. 4: Histograms of Scientific Attitude and Religiosity with respect to religions.

All the tables presented above (**Table 1 to 4**) showed that the coefficient of ZSk and the coefficient of ZKu (as per the assumption of Tabachnick & Fidell, 2007). Those values are under the range of ± 3 and fulfil the assumptions of normality (Tabachnick & Fidell, 2007) and also from the histograms (**Fig. 1 to Fig. 4**), it is evident that the collected data are normal in nature and hence we can apply the parametric statistics here.

ANALYSES AND INTERPRETATION OF THE STUDY:

Testing of Hypotheses:

Testing of $H_{01.1}$: There is no significant difference between male and female students of higher secondary school regarding their Religiosity.

Table 5: Independent Sample Test Between Groups (Female and Male)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Scientific Attitude	Equal variances assumed	.053	.819	1.456	418	.146	1.620	1.113	-.567	3.808

Interpretation: In **Table 5**, the analysis of Levene's test for equality of Variances showed that the F value is 0.053 and its associated significance value is 0.819 ($p > 0.05$). Therefore, homogeneous variance can be assumed for the two groups of gender. The analysis of the t-test for Equality of Means between two groups shows that the $t_{(418)}$ value is 1.456 and its associated significance value is 0.146 ($p > 0.05$). The t-test is not significant at the 0.05 level, and therefore the **$H_{01.1}$ fails to be rejected**; there is no significant difference in Religiosity of higher secondary school students in Kalimpong district with respect to gender.

Testing of $HO_{1.2}$: There is no significant difference between urban and rural students of the higher secondary school regarding their Religiosity.

Table 6: Independent Sample Test Between Groups (Rural and Urban)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Scientific Attitude	Equal variances assumed	1.557	.213	-.369	418	.712	-.374	1.013	-2.365	1.617

Interpretation: In Table 6, the analysis of Levene's test for equality of Variances shows that the F value is 1.557 and its associated significance value is 0.213 ($p > 0.05$). Therefore, homogeneous variance can be assumed for the two groups of gender. Analysis of the t-test for Equality of Means between two groups shows that the $t_{(418)}$ value is -0.369 and its associated significance value is 0.712 ($p > 0.05$). The t-test is not significant at the 0.05 level, and therefore the **$HO_{1.2}$ fails to be rejected**; there is no significant difference in Religiosity of higher secondary school students in Kalimpong district with respect to locale.

Testing of $HO_{1.3}$: There is no significant difference among Arts, Commerce, and Science students of higher secondary school regarding their Religiosity.

Table 7: ANOVA Test Among Groups (Arts, Commerce, and Science)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	53.844	2	26.922	0.265	0.768
Within Groups	42438.004	417	101.770		
Total	42491.848	419			

Interpretation: In Table 7, the analysis of ANOVA has an F value of 0.265 with a corresponding significant value (p -value) of 0.768 ($p > 0.05$). The p -value has a greater value at the 0.05 level of significance; thus, there is no meaningful difference in the mean Religiosity scores among higher secondary students with respect to Streams. Therefore, the **$HO_{1.3}$ fails to be rejected**; there is no significant difference in the religiosity of higher secondary school students of Kalimpong district in relation to their streams.

Testing of $HO_{1.4}$: There is no significant difference among Buddhist, Christian, Hindu, and Islamic students of higher secondary school regarding their Religiosity.

Table 8: ANOVA Test Among Groups (Buddhist, Christian, Hindu, and Islamic)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2703.006	3	901.002	9.420	.000
Within Groups	39788.842	416	95.646		
Total	42491.848	419			

Interpretation: Table 8 describes the result of ANOVA Religiosity with respect to religion. Here, the analysis showed that the F value is 9.420 with the corresponding significant value (p -value) of 0.000 ($p < 0.005$). The p -value is highly significant at the 0.05 level of significance, indicating that there is a significant difference in the mean score of Religiosity of higher secondary school students in Kalimpong district with respect to their religious groups. Thus, the $H_{0.4}$ is rejected; there is a significant difference among Buddhist, Christian, Hindu, and Islamic students of higher secondary school regarding their Religiosity.

Testing of $H_{0.1}$: There is no significant difference between male and female students of higher secondary school regarding their Scientific Attitude.

Table 9: Independent Sample Test Between Groups (Female and Male)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Scientific Attitude	Equal variances assumed	3.207	0.074	-3.093	418	0.002	-3.341	1.080	-5.464	-1.217

Interpretation: In Table 9, the analysis of Levene's test for equality of Variances shows that the F value is 3.207 and its associated significance value is 0.074 ($p > 0.05$). Therefore, homogeneous variance can be assumed for the two groups of gender. Analysis of the t-test for Equality of Means between two groups shows that the $t_{(418)}$ value is -3.093 and its associated significance value is 0.002 ($p < 0.05$). The t-test is significant at the 0.05 level, and therefore, $H_{0.1}$ is rejected; there is a significant difference in the Scientific Attitude of higher secondary school students in Kalimpong district with respect to gender.

Testing of $H_{0.2}$: There is no significant difference between urban and rural students of higher secondary school regarding their Scientific Attitude.

Table 10: Independent Sample Test Between Groups (Rural and Urban)

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Scientific Attitude	Equal variances assumed	6.266	0.013	-2.342	377.774	0.020	-2.221	0.948	-4.085	-0.356

Interpretation: In Table 10, the analysis of Levene's test for equality of Variances shows that the F value is 6.266 and its associated significance value is 0.014 ($p < 0.05$). Therefore, homogeneous variance is not assumed for the two groups of locales. Analysis of the t-test for Equality of Means between two groups shows that the $t_{(377.774)}$ value is -2.342 and its associated significance value is 0.020 ($p < 0.05$). The t-test is significant at the 0.05 level, and therefore **$HO_{2.2}$ is rejected**; there is a significant difference in the Scientific Attitude of higher secondary school students in Kalimpong district with respect to locale.

Testing of $HO_{2.3}$: There is no significant difference among Arts, Commerce, and Science students of higher secondary school regarding their Scientific Attitude.

Table 11: ANOVA Test among Groups (Arts, Commerce, and Science)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	8767.288	2	4383.644	57.172	0.000
Within Groups	31973.559	417	76.675		
Total 40740.848	419				

Interpretation: Table 11, here the analysis showed that the F value is 57.172 with the corresponding significant value (p-value) of 0.000 ($p < 0.005$). The p-value is highly significant at the 0.05 level of significance, indicating that there is a significant difference in the mean score of the Scientific Attitude of higher secondary school students in Kalimpong district with respect to their academic streams. Hence, **$HO_{2.3}$ is rejected**; there lies a significant difference in scientific attitude among arts, commerce, and science higher secondary students of Kalimpong district.

Testing of $HO_{2.4}$: There is no significant difference among Buddhist, Christian, Hindu, and Islamic students of higher secondary school regarding their Scientific Attitude.

Table 12: ANOVA Test among Groups (Buddhist, Christian, Hindu, and Islamic)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	395.211	3	131.737	1.358	0.225
Within Groups	40345.636	416	96.985		
Total 40740.848	419				

Interpretation: Table 12, here the analysis of ANOVA has an F value of 1.358 with a corresponding significant value (p -value) of 0.225 ($p > 0.05$). The p -value is greater than the 0.05 level of significance; thus, there is no meaningful difference in the mean Scientific Attitude scores among higher secondary students with respect to religious groups. Therefore, **$HO_{2.4}$ fails to be rejected**; there is no significant difference in the scientific attitude of higher secondary school students of Kalimpong district in relation to their religion.

Testing of HO_3 : There is no significant relationship between the Scientific Attitude and Religiosity of higher secondary school students in Kalimpong district.

Table 13: Correlation between Scientific Attitude and Religiosity

		Scientific Attitude	Religiosity
Scientific Attitude	Pearson Correlation	1	-0.053
	Sig. (2-tailed)		0.276
	N	420	420
Religiosity	Pearson Correlation	-0.053	1
	Sig. (2-tailed)	0.276	
	N	420	420

Interpretation: A Pearson correlation was conducted, **Table 13** showcased the result of the correlation, where the following points were observed: Pearson Correlation (r) = -0.053; Significance (p -value) = 0.276; Sample size (N) = 420. The obtained correlation coefficient ($r = -0.053$) indicates a **very weak negative correlation or relationship between Scientific Attitude and Religiosity**. The relationship is so small that it has practically no predicative or explanatory value. Additionally, the significance value $p = 0.276$ is greater than 0.05, meaning the correlation is not statistically significant. Therefore, the correlation is weak and statistically insignificant; **HO_3 fails to be rejected**, and there is no significant relationship between the Scientific Attitude and Religiosity of higher secondary school students in Kalimpong district.

MAJOR FINDINGS

The testing of hypotheses showed that there are relative differences in the Scientific Attitude of Higher Secondary School Students of Kalimpong district between female and male groups, rural and urban groups, and among arts, commerce, and science groups. Whereas, the Scientific Attitude of Higher Secondary school students did not show any difference based on their religion, i.e., Buddhist, Christian, Hindu, and Islamic. In addition, there were no differences in the religiosity of higher secondary school students of Kalimpong district between the female and male groups, the rural and urban groups, and among the arts, commerce, and science groups. Whereas, the Religiosity of Higher Secondary school students showed a relative difference in terms of their religion, i.e., Buddhist, Christian, Hindu, and Islamic. The study reflects that the scientific attitude of Higher Secondary School Students of Kalimpong district has been affected by gender, locale, and streams, but not by their religion. Similarly, the Religiosity of Higher Secondary School Students of Kalimpong district is

influenced by their religion and not by their gender, locale, or streams. The study indicated a very weak negative correlation between Scientific Attitude and Religiosity. The relationship is so small that it has no explanatory value, or it can be said that if religiosity increases, Scientific Attitude decreases, however, in a very negligible amount. Additionally, the significance value ($p = 0.276$) is found to be greater than 0.05, meaning the correlation is not statistically significant. Therefore, the correlation is weak and statistically insignificant; there is no significant relationship between the Scientific Attitude and Religiosity of higher secondary school students in Kalimpong district.

CONCLUSION

A statistically insignificant relationship between Religiosity and Scientific Attitude among higher secondary students in Kalimpong district has been pointed out by the findings of this study. However, minor variations across demographic groups have been observed. In the Indian context where religious strains can be found almost in every aspect of life, such a study not only challenge the existing literary findings but also monitor the present scenario of the multicultural society. At the higher secondary level, the scarcity of referential evidence will be remunerated in a small extent by this work. Importantly, this study prioritises comparatively less explored area along with understanding the pattern of behavioural trends correlated with dynamical cultural metamorphism. In the globalised perspective and appreciating the findings of the reported research works, an important linkage has been explored in terms of instructive tactics, logical discerning, individualities and the most importantly existing belief system. The present study affirms the fact that whatever may be our belief system but our scientific temper is promoted by pedagogical strategies in a large extent. Therefore, this study broadens the pathway for future research especially in the domain of personality traits and scientific attitude with respect to religious practices.

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REVIVING INDIGENOUS WISDOM THROUGH INDIAN KNOWLEDGE SYSTEM IN HIGHER EDUCATION

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ABSTRACT

This paper explores the revival of Indigenous Wisdom through Indian Knowledge Systems (IKS) and its implications for the paradigm change in higher education in India. It explores the philosophical and contemporary practices, educational possibilities and policy approaches regarding integrating IKS with the university curriculum. This study adopts a qualitative research approach that is based on secondary data and theme analysis through a collection of relevant works from academia, policy documents and institutional reports. Studies have shown that Indigenous Knowledge Systems, which are based on holistic, experiential and value-based education, promote intellectual, ethical and ecological development. In spite of the institutional recognition through the measures taken in the framework of the National Education Policy (NEP) 2020, barriers like lack of knowledge among teachers, lack of coherence in the curriculum, epistemic prejudice etc., continue to pose challenges to implementation of NEP 2020. To ensure sustainable integration, the study suggests multifaceted solutions such as curriculum reform, teacher development, preservation through technology, and community engagement. The renewal of Indigenous Knowledge System represents a move toward a model of higher education that is inclusive, culturally relevant, and globally relevant that acknowledges history, tradition and innovation.

Keywords: Indian knowledge systems, Indigenous wisdom, Higher education, Holistic learning, Value-based education, Educational policy.

INTRODUCTION

In recent years, the importance of introducing Indian Knowledge Systems (IKS) within mainstream Higher Education has been highlighted. The Indian Knowledge System is a reflection of several traditions of intellectual, philosophical, scientific and cultural practices that have shaped Indian civilization and played a significant part in shaping global ideas (Ranganathan, 2021). However, western epistemologies have been given dominance in the Indian education system from colonial time and indigenous approaches have been ignored and thus this leaves a dissonance between the students and indigenous culture (Kumar & Singh, 2020). Accessing Indigenous knowledge is IKS's attempt to bridge this epistemic gap by calling for an expanded notion of education as character and intellectual development. The inclusion of Indian Knowledge Systems (IKS) in the National Education Policy (NEP) 2020 suggests its importance in the promotion of transdisciplinary and value-based learning and thus the importance of decolonising education. There are various disciplines associated with IKS like linguistics, environmental sustainability, Ayurveda, yoga, mathematics and ethics which are useful for the production and utilization of knowledge (Sharma, 2019).

Qualitative studies on this theme examine the perceptions of IKS by educators and students, challenges of integrating traditional knowledge with modern system of academics and transformational possibilities of integration of traditional knowledge (Chakraborty, 2022). Case analysis/Case studies, interviews and narratives provide insights for researchers on the ways universities are reinterpreting indigenous epistemologies in today's contexts. This kind of research contributes to developing intellectual diversity, cultural continuity in higher education and helps in enacting policies (Patel & Menon, 2021). If applied, IKS can be positive in the revival of indigenous wisdom which is a positive step towards an inclusive and pluralistic educational paradigm as opposed to a nostalgic sentiment. By prioritizing traditional knowledge as well as scientific research, it is possible to produce globally competent but culturally grounded workforce from Indian higher education that can help in addressing the tough challenges of the modern times (Rao, 2023).

RATIONALE OF THE STUDY

The desire to understand the re-nascence of Indian Knowledge Systems (IKS) in the field of education and research in universities is fuelled by the need to bring back cultural roots, epistemological diversity and holistic learning and teaching methodology in the present educational and research landscape. India's educational system being largely based on western epistemologies nurtured in the colonial era has been emphasizing rationalism and utilitarianism over all-round knowledge with values relevant to the context (Kumar & Singh 2020). This has led to the peripheralization of local customs which formed the core of Indian education and research. Thus, there is an urgent need to revivify Indigenous Knowledge Systems in Higher education with the aim of forming intellectual self-reliant, culturally grounded and morally conscious students (Ranganathan, 2021).

NEP 2020 advocates for transformation of knowledge system that emphasises incorporation of ancient Indian wisdom into modern scientific research (Ministry of Education, 2020). This is a view in which education is understood as a process of building and developing thinking competence and moral, emotional and spiritual intelligence. Indian Knowledge System includes a vast body of indigenous knowledge in various areas such as health sciences (Ayurveda, Yoga), Paninian grammar system, mathematics and environment conservation, philosophy (Sharma, 2019). These systems can be integrated into higher education programs to promote sustainable and ethical practices and improve interdisciplinary learning.

Despite policies, the actual implementation of Indigenous Knowledge Systems in the universities is still limited. There is a mismatch in the understanding of the perception of teachers, students and academic stakeholders towards IKS and the negotiation of its incorporation into a modern institutional system (Chakraborty, 2022). It will therefore be important to understand the lived experience, perspectives and barriers encountered by those stakeholders involved in this transition through a qualitative investigation. This investigation can identify whether IKS is considered as a symbolic upgrading or a legitimate epistemic alternative with the potential to change the processes of teaching and learning (Patel & Menon, 2021).

In a global context, this study is relevant as the issue of educational decolonisation appears to be at the fore. Revitalisation of Indigenous Knowledge Systems (IKS) can support a pluralistic knowledge model that can be locally specific and yet in touch with the universal concepts (Rao, 2023). This research aims to shed light on the educators' and learners' outlook and experiences to contribute to the meaningful integration of indigenous wisdom into higher education for the realization of the Indian universities as innovations that balance tradition with modernity.

REVIEW OF RELATED LITERATURE

Indian Knowledge System (IKS) is a set of several intellectual domains like philosophy, science, arts and pedagogy, which are deeply rooted in the legacy of India. Such systems are a combination of ethical, ecological and spiritual dimensions of knowledge which is an extreme contrast to higher education system of the West, based on positivist worldview (Rao, 2020). It is argued that with the introduction of Indigenous Knowledge Systems in modern curricula, the academic diversity could be enriched, along with the regaining of cultural identity and of epistemic sovereignty (Chatterjee, 2023).

Many research works highlight the philosophical and pedagogical relevance of Indigenous Knowledge Systems for addressing educational challenges of today. Experiential learning based on values was the core aspect of the Indian Gurukula education system, where intellect alongside character was nurtured by Mishra (2022). Bhattacharya (2021) noted that some of the ancient Indian philosophies such as Nyaya (logic) and Sankhya (analytical reasoning) emphasized critical questioning and reflection, which are key to higher education. The adoption of indigenous pedagogies can engender holistic human development - knowledge and character in action. IKS is increasingly recognized as a tool for raising awareness on environment, society and cultural sustainability (Rani & Kapoor, 2020).

Indigenous Knowledge Systems (IKS) have been acknowledged in recent legislative efforts. Traditional knowledge, languages and multidisciplinary approaches are recommended to be integrated in higher education in the National Education Policy 2020 (Government of India, 2020). Sinha and Gupta (2023) carried out a research to show that a number of universities with IKS oriented courses been reported to have higher degree of participation as well as better contextual understanding of students. However, it continues to remain disjointed because of inadequate institutional structures, lack of faculty preparedness (Verma, 2022).

Such an effort to decolonize knowledge is happening in indigenous education in Canada, New Zealand, and Africa in which indigenous epistemologies are integrated into programs to support cultural continuity and social justice (Battiste, 2013; Smith, 2021). Studies have shown that indigenous conceptual systems revitalization is a way to enrich the epistemic diversity and enhance students' sense of belonging. In India, embedding traditional knowledge into the mainstream of higher education institutions remains in a nascent stage, often just being offered as elective courses or as cultural studies courses (Menon, 2022).

While research on the qualitative effects of Indigenous Knowledge Systems (IKS) on higher education and students is limited, theoretical discussions on IKS are increasing. Most

of the existing literature does not focus on the empirical and interpretive works of lived experiences, but rather on descriptive and philosophical analysis (Rao & Patel, 2023). Few studies have looked at teachers' and students' understandings, appropriations and application of Indigenous knowledge in the academic environment.

RESEARCH GAP

Notwithstanding increasing policy advocacy and academic interest, a deficiency of qualitative, field-based research persists about the revival, interpretation, and application of Indian Knowledge Systems in higher education institutions. Current research seldom documents the lived experiences, problems, and transformative possibilities of integrating Indigenous wisdom into contemporary curricula. This study aims to address this gap by qualitatively examining the processes and perspectives associated with the revival of Indigenous wisdom through Indian Knowledge Systems in higher education.

OBJECTIVES OF THE STUDY

The objectives of the study are as follows :

O₁ : To explore the philosophical foundations and core principles of Indian Knowledge Systems (IKS) in order to understand their relevance and applicability in contemporary higher education.

O₂ : To examine the current practices, perceptions, and challenges related to the integration of Indigenous wisdom and IKS frameworks in Indian universities and colleges.

O₃ : To analyze the potential of IKS-based pedagogical approaches in promoting holistic learning, value-based education, and sustainable development among higher education learners.

O₄ : To propose strategies and policy recommendations for effectively revitalizing and institutionalizing Indian Knowledge Systems within higher education curricula and research practices.

DISCUSSION & FINDINGS

Objective 1: To explore the philosophical foundations and core principles of Indian Knowledge Systems (IKS) in order to understand their relevance and applicability in contemporary higher education.

A secondary source analysis yields several related themes that shed light on the philosophical background and core concepts of Indian Knowledge Systems (IKS), and the role these play in higher education. The principal themes discussed are integrative epistemology and interrelatedness of knowledge, experiential-reflective learning relationship, value-based education and ethics, sustainability and harmony with nature, as well as integration of knowledge and practice.

Comprehensive Epistemology and the Interrelation of Knowledge

The primary subject emphasizes the integral nature of an Indian epistemology, which considers knowledge (jnana) less disjointed and its very coherent whole in its spiritual, intellectual, moral and practical aspects (Rao, 2019). Ancient Indian literature, like the Upanishads and Vedas, perceive learning as a means of attaining unity between the individual and the cosmos (Sharma, 2020). This is a holistic perspective different from that of the fragmented and subject-based approach found in the modern educational approaches. This epistemology can facilitate learning in interdisciplinary ways in the contemporary university education and help develop critical consciousness among the students (Tripathi & Mishra, 2021).

Experiential and Reflective Learning

One of the most noticeable themes that comes across from the literature is the experiential and introspection attribute of an Indian pedagogy. Anubhava (experience) and Manan (reflection) were an integral part of the learning process in the gurukula system (Joshi, 2018). Education was not only about the external dissemination of information, but also a way to internalise knowledge through engaging in the experience and reflection. In that sense, the incorporation of this concept in the field of higher education can enhance student engagement and promote reflective learning, all the while rendering a strongly experience-based approach and in-line with contemporary understandings of constructivist and experiential learning (Kumar, 2022).

Indian Knowledge Systems are rooted in moral and ethical education which focuses on dharma (good conduct) and self-discipline (Radhakrishnan, 2017). Education should be not only about academic achievement, but about character and caring and about achieving one's potential. In this concept lies UNESCO's promotion of "education for sustainable and ethical futures" (UNESCO, 2021). A reintroduction of moral and spiritual aspects within the higher education system may help ease the increasing concerns that the focus on technology in higher education is destroying human values.

Environmental Sustainability and Coexistence with Nature

One of the key principles of Indigenous Knowledge Systems (IKS) is sustainability. Coexistence with the environment is encouraged in ancient Indian philosophies, and ecological stewardship and balance are the key features (Mukherjee, 2019). They are also aware of concepts such as prakriti (nature) and rita (cosmic order), which do not only point to the profound ecological awareness of the Vedic tradition, but also resonate with the current global discourse on environmental education and sustainable development. There is a scope to implement these ideals in Higher Education which can improve ecological literacy and build responsible citizenship (Patra, 2023).

Convergence of Knowledge and Practice

Finally, IKS emphasizes the need for combining jnana (knowledge) and karma (activity), and states that without the actualization of learning (karma), there can be no

knowledge (jnana) (Rao & Singh, 2020). It is now being realised in the concepts of experiential learning, skill-oriented courses, and community engagement in the universities. This integration encourages students to apply theory in their approach to practical problems and thus to produce social innovation and community development.

The overall philosophy of Indigenous Knowledge Systems – “whole system, experiential, value based learning, sustainability and practice-based” – is very relevant to re-imagine the higher education in India. The reintegration can help build a radical educational system that encourages wisdom, ethics, and sustainability alongside intellectual growth.

Objective 2: To examine the current practices, perceptions, and challenges related to the integration of Indigenous wisdom and IKS frameworks in Indian universities and colleges.

The current literature referred to this topic reveals four main themes of perception, process and barriers of the realization of Indian Knowledge Systems (IKS) in higher education institutions. Themes include highlighting institutional awareness and policy support, dealing with curricular integration/pedagogical change, readiness of the faculty and cooperation with other disciplines and working with structural and attitudinal barriers.

Increasing Institutional Acknowledgement and Policy Endorsement

The recognition of Indigenous Knowledge Systems (IKS) has grown into a crucial component of the transformation of higher education, especially in recent times. The preservation and rejuvenation of the nation’s traditional knowledge system and its integration into the formal educational landscape are being promoted through policy reform such as the National Education Policy (NEP) 2020 (Ministry of Education, 2020). Research and education in the field of Indian Knowledge Systems (IKS) have already started with institutions like the Indian Institute of Technology (IITs), Indian Knowledge Systems (IKS) Division under AICTE and Indira Gandhi National Open University (IGNOU). The growing institutional and policy support represents a shift from the colonial knowledge structures to more culturally and inclusive models of education (Rao, 2022).

Inclusion in Curriculum and Adaptation of Pedagogy

Manifestation of Indigenous Knowledge Systems (IKS) in higher education curricula has largely been in the form of elective courses, seminars and research centres for Ayurveda, Vedic mathematics, Sanskrit studies, and traditional ecological knowledge (Nair, 2021). The work is however often jerky and unfocussed in a pedagogical sense. This implies curriculum development in conventional disciplines, in order to connect traditional and contemporary epistemologies, by incorporating Indigenous Knowledge Systems (Tripathi & Singh, 2023). Some innovative pedagogical approaches involve leveraging experiential learning, incorporating community engagement, and fostering reflection and critical thinking, which have shown potential for bridging the gap between traditional knowledge and modern academic systems and thinking (Kumar, 2022).

Faculty Readiness and Interdisciplinary Cooperation

One of the significant topics is related to the awareness, training, and interdisciplinary collaboration of faculty. For an effective implementation of IKS effective and competent teachers are needed who have good knowledge of the tradition and can frame it in the context of today's scientific and humanities-based approach (Joshi, 2020). An existing research identified the lack of adequate skilled teachers and research scholars in the field of indigenous knowledge traditions (Reddy & Mishra, 2022). Interdepartmental collaboration through philosophy, environmental studies and education can facilitate cross disciplinary discourses and foster integration of Indigenous Knowledge Systems (IKS) in research and pedagogical practices (Mukherjee, 2023).

The structural obstacles and attitudinal biases are recognized.

Many barriers could be identified for full integration of Indigenous Knowledge Systems (IKS), although the awareness can be seen as strong. Among these are lack of institutional funding, absence of standardized resources and scholarly scepticism (Patra, 2022). Contrary to this a large number of scholars still consider Indigenous Knowledge Systems (IKS) to be unscientific and unmodern, which means there are some voices of opposition in mainstream academic spaces (Rao & Singh, 2021). The knowledge, experiences and understandings from indigenous communities are often pushed to the edges of the higher learning curriculum and restricted to a narrow space of legitimacy and acceptance in the western epistemologies (Bala, 2020). Capacity development is required to overcome those challenges, as well as validation of research and a commitment to epistemic pluralism among institutions.

Indian Knowledge Systems are often now acknowledged as a rich educational heritage but there is an incomplete and inconsistent integration into the higher education. Innovation and adaptation in education within a policy framework, faculty development as well as an open-minded approach towards indigenous knowledge systems is required for a revolution in transition. An interdisciplinary and diverse context of applying Indigenous Knowledge Systems can lead towards achieving a more inclusive and culturally sustainable way of making and sharing knowledge in higher education.

Objective 3: To analyze the potential of IKS-based pedagogical approaches in promoting holistic learning, value-based education, and sustainable development among higher education learners.

Out of the literature analysed regarding pedagogical practices that draw on Indian Knowledge Systems (IKS) four themed findings conclude – the transformative can happen in higher education on four pillars: holistic and integrated learning, value-oriented and ethical education, experiential and community-based pedagogy, and sustainability and ecological consciousness.

Comprehensive and Cohesive Education

The five factors, being the intellectual, emotional, physical and spiritual of the learner and the aspiration for the whole being are the main thrust of IKS pedagogy (Radhakrishnan,

2017). In the classical Indian world, the learning is about purnata-wholeness of being which is beyond just intellectual development (Sharma, 2020). They are holistic approaches which challenge the fragmented discipline of the modern era and promote integrated thinking (Tripathi & Singh, 2023). Within Higher Education, IKS pedagogy encourages the idea of knowledge constructed as a webbed network of connections, promoting creativity, empathy and critical sensibilities. This integrated model reflects contemporary models of liberal and multidisciplinary education that is provided in the National Education Policy (NEP) 2020 (Ministry of Education 2020).

Ethical and Value-Centric Education

IKS based pedagogy focuses on moral and spiritual values as a key goal of education. Indian education is based on principles like dharma (moral duty), seva (selfless service) and satyam (truth) (Joshi, 2019). These concepts aim to instill self-discipline, empathy and social responsibility in students. In modern times, scholars in education have supported the integration of values for promoting ethical leadership and social cohesion (Rao, 2022). Addressing the emergent instrumentalisation of education in Higher Education through a value-oriented education can help to promote humanistic and responsible citizenship.

Experiential and Community-Centric Pedagogy

A key element is the experiential and community basedness of IKS pedagogy. In the traditional learning method of gurukula the focus was on learning through observation, participation, reflection and experiential knowledge (anubhava and manan) (Kumar, 2021). Learning was deeply contextual and life-bound and it was strongly shaped by the teacher and student relationship (guru-shishya parampara). It is a pedagogical approach that is parallel with experiential learning theories and recent service learning approaches (Kolb, 2015). The implementation of experiential approaches, where IKS are introduced in higher education, such as craft-based practices, ayurveda, inclusion of Yoga or environment practices, can bring together the theory and practice, empathy and social involvement.

Environmental Consciousness and Sustainability

A focus on environmental harmony and promoting sustainable ways of living is an integral part of the IKS curriculum. The ancient scriptures such as Atharvaveda, Upanishads state the emplacement of Vasudhaiva Kutumbakam, or the cosmos as one family, as well as respect for all living beings (Mukherjee, 2019). Students learning with these ideas will have sustainable practices and awareness about environment (Patra, 2023). UNESCO (2021) states that it is possible to use TEK (traditional ecological knowledge) in university curricula such as the famous organic farming, the biodiversity preservation and the methods of water conservation to improve EE (environmental education) and to advance the Sustainable Development Goals of the UN.

Pedagogical approaches which are based on Indian Knowledge Systems emphasize upon the ethical consciousness, ecological stewardship and holistic development making education a transformative and life centric one. These activities may be contextualized as an experience in higher education, and India can develop the students as strong, morally

responsible and environmentally aware citizens. This way of teaching and learning is in line with the aim of the global community to make it human oriented, sustainable and compassionate.

Objective 4: To propose strategies and policy recommendations for effectively revitalizing and institutionalizing Indian Knowledge Systems within higher education curricula and research practices.

Thematic analysis of the current literature, policy documents and institutional reports identified five major themes for the enabling, rejuvenation and institutionalization of the Indian Knowledge Systems (IKS) in higher education: Policy and institutional support, Curriculum reform and pedagogical integration, Faculty growth and research capacity building, Knowledge preservation through technology and collaboration, and Community participation and global outreach.

Policy and Institutional Assistance

The key critical approach is solid policy and institutional bases. In keeping with this, the National Education Policy (NEP) 2020 highlights the integration of Indigenous Knowledge Systems (IKS) in various disciplines to impart cultural understanding, sustainability and global relevance (Ministry of Education, 2020). Various initiatives of the Government such as the Indian Knowledge Systems Division in the Ministry of Education and the work of the AICTE's IKS Centres are now encouraging Research and Training (Rao, 2022). Effective institutionalization requires imparting a trust in policies, the availability of finance and also includes integrating Indigenous Knowledge Systems in accreditation and ranking of institutions for effective sustainability (Sharma & Patel, 2021).

Curricular Reform and Pedagogical Integration

The inclusion of IKS in curriculum requires shift from content-centred training to more holistic, realistic and values-led learning approaches. Universities can launch interdisciplinary courses like blending ancient knowledge (Ayurveda, architecture, agriculture and language) with modern science perspectives (Tripathi & Singh, 2023). There should be a match between the educational methodologies and indigenous knowledge systems which are based on the concept of anubhava (experience), manan (reflection) and praxis (activity) (Kumar, 2021). (Curriculum) Integration of Indigenous Knowledge Systems into teacher preparation, the environmental studies curriculum and philosophy curricula can be used as a means to systematically spread indicators of change to all educational levels.

Building the capacity of Faculties and Researching Competence

Research infrastructure and expertise need to be kept in place to facilitate IKS-integration. It is suggested that there should be a number of specialised IKS Research Centres to study ancient text, Sanskrit and Indigenous Sciences, and training programmes and fellowships be established for scholars in these fields to enhance the academic standing (Mukherjee, 2023). Collaborative research and innovation that emerges through two streams of knowledge, those of the traditional practitioners and those of contemporary scholars can

give rise to new techniques as described by Reddy & Mishra (2022). Opportunities for grants, including interdisciplinary doctorates, and publications by research on IKS could help to expand the academic engagement and visibility.

The Preservation of Knowledge through Technology and Collaborations

The open access databases and the digitization will play a key role in preserving native manuscripts and the dissemination of these on a global level. Traditional knowledge could be made available to the larger community through digital repositories, MOOCs on Indigenous Knowledge Systems and virtual heritage archives (Nair, 2021). By strategic cooperation among universities, research institutions and cultural institutions, an exchange of information and good practice can be encouraged. It is possible to create intermediary platforms with technology that link between the traditional practitioners and contemporary researchers.

Community Involvement and International Outreach

This work has led to the revitalization of not only the concept of Indigenous Knowledge Systems (IKS) but also to the need for participation of the people themselves and crafts people who guard indigenous wisdom in this process beyond the scholarly world. To provide hands-on learning experiences, Universities may create Community Based Learning Centre (Field immersion Programmes) (Patra, 2023). Further, global partnerships and international meetings on Indigenous Knowledge Systems (IKS) could be pivotal to India becoming a knowledge leader for diversity in intercultural interactions and learning (ICL, 2021).

A comprehensive blueprint will be needed for the institutionalization of IKS, which must cover policy- and curriculum-reform, faculty development, technology development, as well as community engagement. By implementing these measures, not only will India's intellectual legacy be safeguarded, but also the path will be laid down for an inclusive, ethical, sustainable higher education system that aligns with India's national development goals and global agendas for higher education.

CONCLUSION

The study recognizes and emphasizes that Indigenous Knowledge Systems (IKS) have the transformative potential of reimagining higher education in India, through the revival of Indigenous wisdom. The epistemological approach is: experience-based and value-based learning, in the context of IKS, an experience-based and value-based approach to knowledge creates a focus on integrated knowledge, ethics and sustainability. Thematic analysis results indicate that while there are some policy efforts beginning to take steps to accepted innovations in institutional recognition and embracing IKS, the issues of faculty preparedness, curricula standardization and epistemological bias remain. There was a need for revival that would be true and effectual—it would develop through inclusive strategies with a emphasis on the care of true curriculum change through inter-disciplinary cooperation and community engagement. Indigenous philosophies and practices as embedded in modern pedagogy can

help us transcend the transmission of information towards character formation, ecological awareness and social harmony in the context of higher education. In essence, institutionalization of IKS will contribute towards building a learner-centric intellectual, moral and global citizens, thus blending an Indian education with the contemporary aspirations of the world.

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YOUNG LEARNERS' THEORY OF MIND (TOM) AND NARRATIVE RETELLING WITHIN MULTILINGUAL CONTEXT: SOME DISCUSSIONS ON THE CONCEPT, METHODOLOGY AND TASKS

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ABSTRACT

In the Indian context, most students in the primary schools are either bilingual or multilingual. They bring their own resources in terms of their mental states: true and false beliefs, desires, perspectives, emotions, language repertoire and culture. The learners use their mental states and language from their repertoire in their daily conversations and interactions with their family members and friends. They also use them to complete their tasks at schools. Therefore, we expect to see a positive effect on young children's linguistic and cognitive growth if they are able to perform well at expressing their mental states through the use of their language(s). However, research looking at these aspects- children's mental states and their ability to express them via language- is very sparse. This paper gives a critical review of children's theory of mind and the aim is to discuss some of constraints and its solutions pertaining to ToM itself. Review papers have provided a lot of information regarding ToM and its methodology. After a careful study of previous studies, we have attempted in this paper our selective rationale and decision for adopting and designing tasks and test constructs, and measures for the study in the Indian multilingual context.

Keywords: Multilingual, Theory of mind (ToM), Narrative retelling, Mental states, Methodological challenge.

INTRODUCTION

India is a linguistically diverse country that caters to 22 officially recognized languages spoken by 96.71% of the population and 121 languages spoken by more than 10,000 people (Linguistic diversity index, UNESCO, 2009; Government of India, 2001). This multilingual reality presents a host of opportunities and challenges to all the stakeholders of the country. One of the obvious challenges is the clear assessment of language development from infancy. Children and their linguistic knowledge differ in terms of individual differences, group differences, regional differences, etc (Ellis, 2004; Hu, 2003). In the context of India, since we have multiple languages and children acquire more than one language from infancy, to a large extent they are able to process and produce language of their immediate contact

(Tsimplici et al., 2020). Studies have found that children in multilingual contexts are linguistically and cognitively more developed than the monolinguals. They can process, understand and produce more than three languages, explain concepts, and simplify ideas without any hesitations (Mohanty & Babu, 1983). For majority of the children in Indian context, codeswitching is a common phenomenon and it provides them accessibility and opportunity to bring out their thought process in a very convenient manner. They are able to express their ideas, beliefs, emotions, perspectives, etc., using more than one language at a time (example, Hindi-English, Hindi-Assamese, Hindi-Bangla) (Kirsch, 2006; Yee & Ho, 2007). These kinds of language shifting practice are very much evident in children from the age of 4 in multilingual context and India is no exception. Flexibility to use these communication shifts is a proof of language development among the children (Ezeh, Umeh, & Anyanwu, 2022).

Using these language strategies, children from an early age are equipped in understanding and producing languages for their desires, beliefs, perspectives, emotions, decisions etc. These elements are thus called as mental states and can be heard in children while they narrate or describe instances of their daily life, interacting with others- friends, family members, siblings, and other members they know in their vicinity (Ramzan, Aziz, & Ghaffar, 2021; Tay, 1989; Reyes, 2004). A very important aspect will be to understand their language of narrative and their language in their mind. The ability to understand and talk about self and others' perspectives is what we understand as theory of mind (Wimmer & Perner, 1983; Wellman & Liu 2004; de Villiers & de Villiers, 2014; Wellman, 2018). Research in the area of theory of mind (ToM) talks in great detail about children's comprehension of the world and how they reveal their minds in their languages. Tests and assessments have been designed and administered to understand the interrelation between TOM and language the children produce (Wimmer & Perner, 1983; Denham et al., 1990; Flavell, 2004; O'Hare et al., 2009). The current paper discusses this pertinent issue of how children reveal their minds in the context of ToM. Additionally, it will also discuss some of the methodological challenges in the research area of theory of mind.

WHAT IS THEORY OF MIND?

The term *theory of mind* is referred to a child's ability to understand people as mental beings who also have beliefs, desires, emotions, intentions, perspectives and whose activities can be explained by taking account of these mental states (Wimmer & Perner, 1983; Astington, Harris, & Olson, 1988; Wellman & Liu 2004; de Villiers & de Villiers, 2014; Wellman, 2018). 'ToM' as a term was first used by Premack and Woodruff in their seminal text titled, 'Does the Chimpanzee have a theory of mind?' in 1978. ToM is widely studied across many disciplines such as Philosophy and Psychology in which researchers have been trying to comprehend the mental states of humans (Fodor, 1987; Churchland, 1981). Especially in the area of developmental psychology, the mental states of young people have been studied (Gopnik and Wellman, 1992; Gopnik and Meltzoff, 1997; Wellman, 2018) as the children develop their minds during early childhood. It was debated that theory of mind is primarily evident in humans when they start acquiring language towards the beginning of second year until the age of five (Bretherton, McNew, and Beeghly-Smith, 1981; Gopnik, 1990).

The larger search for studying ToM was children's understanding of mental states in general which was studied in two ways. First by assessing pre-schoolers' appreciation of how anybody's beliefs and desires are different from his own intentions, and secondly by assessing a child's understanding that physical objects and thoughts are two different kinds. One kind being the ontological things, nonmaterial and mental things versus the other one being the physical, tangible, and real things (e.g. a thought about a dog versus a dog as an object) (Perner, 1998; Wellman 1990). Much of the research has been conducted and therefore, we have studies of ToM on a continuum from infancy to adulthood and of late life. Apart from studying children's understanding of beliefs and desires, research has broadened to studying emotional development, pretend play and engagement, telling lies and many more. The studies tried to understand what the mind reveals by using mostly controlled experimental tasks (Astington, Harris, & Olson, 1988; Frye & Moore, 1991; Baron-Cohen, Tager-Flusberg, & Cohen, 1993; Wellman & Liu, 1994, 1997; Hare & Tomasello, 2005; Wellman, 2014) and longitudinal studies analysing real life expressions collected from children's daily conversation about humans and minds using terms like want, think, guess and feel (Bretherton & Beeghly, 1982; Shatz, Wellman, & Silber, 1983; Dunn, Bretherton, and Munn, 1987).

If we have to do a basic review of the research on ToM then understanding false beliefs of children will be the starting point. It is believed that tasks like false beliefs-I & II can be use authentically with toddlers and small kids in a variety of everyday circumstances. Therefore, a big storage data of false belief is available that informs us about young children's understanding of mentalistic abilities in many different cultural communities (Liu, Wellman, Tardif, & Sabbagh, 2004; Milligan, Astington, & Dack, 2007; Slaughter, Imuta, Peterson, & Henry, 2015; Wellman, Cross, & Watson, 2001). More than 200 studies have already been conducted with the age groups ranging from 3 to 5 years old, as early as in 2001 from 7000 children. Task constructs include both verbal and non-verbal, that were asked to young children if they can really find out whether they were videotaped humans, real humans, story characters, toy figurines, etc. (Wellman, Cross, & Watson, 2001).

Researchers working in longitudinal studies of ToM were of the view that research only on false beliefs do not capture the developmental growth of children's mind as there are also other mentalistic abilities like desire, knowledge and emotions. Therefore, a clear developmental perspective was needed (Bretherton & Beeghly, 1982; Shatz, Wellman, & Silber, 1983; Wellman, 2012). This led to parallel research on desires, beliefs, emotions, perspectives and thereby a progression of reasoning about desires to beliefs of young kids can be seen in various experimental tasks which were carefully reviewed by Wellman and Liu in their meta-analysis that also includes children's daily conversations (perspectives) of people's actions and minds (Bartsch & Wellman, 1995; Ruffman, Slade, & Crowe, 2002; Tardif & Wellman, 2000a). In the meta-analysis, Wellman and Liu has highlighted five important categories that captures ToM in a parallel manner and they are (a) Diverse desires (DD)-people can have different desires, even different desires for the same things, (b) Diverse beliefs (DB)-people can have different beliefs, even different beliefs about the exact same situation, (c) Knowledge access (KA)-something can be true, but someone might not know

that, (d) False belief (FB)-something can be true, but someone might falsely believe something different, and (e) Hidden emotion (HE)-someone can feel one way but display a different emotion (2004).

OVERVIEW AND CONTEXT OF THE STUDY

This study is a part of an independent collaborative research work that investigates three variables respectively- literacy skills, ToM and narrative retelling. The intention of the study is to investigate if literacy skills, especially reading ability of young learners is positively affected by their ToM and narrative retelling abilities. Tasks on literacy skills, ToM and narrative retelling abilities were administered to young ESL learners from Grade 4 and 5. A specific population is targeted for the study based on our convenience for data collection and analysis. Therefore, this particular study is carried out in the Musiri region of Tiruchirappalli district of Tamil Nadu. Participants from two schools were selected for the study whose primary language of communication is Tamil. In one of the schools, the MOI is English and Tamil in the other school. More details on demographic profiles of the population are provided in the latter half of this section. However, in this current paper, the population remains the same but we limit our discussion to the test constructs and tasks for ToM and narrative retelling, and their methodological challenges. It is in this regard that this paper would like to highlight the issues and challenges of tests and its constructs in relation to experimental tasks and longitudinal studies.

Below are the demographic details of the participants who participated in the study.

Participant's Profile

Table 1. Overall profile of the participants

Location	Number of participants (N)	Gender	Age Range	Age (Mean & SD)	Medium of Instruction (MoI) & learner profile
Musiri, Tiruchirappalli District, Tamil Nadu	102	m=47	8-11 years	Mean=9 SD= 1	Tamil (MoI) = 62 (m=28; f=34)
		f=55			English (MoI) = 40 (m=19; f=21)

For this research, the participants were selected based on socio-economic conditions, gender and medium of instruction. 102 multilingual primary school children attending grade 4 and 5 took part in the study. The children are from the Musiri region of Tiruchirappalli district of Tamil Nadu, India. Under Tiruchirappalli district, there are different educational blocks and the field of study for this particular research is Musiri educational block which has again different clusters based on the locality. The participants formed for this study depicted a cluster of population (n=102) which represents approximately 800 students under the Musiri region. These clusters under Musiri region have schools which are government, government aided and private in nature.

RATIONALE OF THE STUDY

With a conviction in mind, we wanted to explore the literacy skills of the target population, especially their reading skills. But we came across studies which look at the larger picture which is learners' ability to speak their minds. Whatever concepts or ideas we try to teach in the classroom through their textbooks, they already have learnt at their homes and in their nearby environment while interacting with their parents, siblings, friends, acquaintances etc. Therefore, we find this aspect of learners' narratives more striking and relevant to their ability to read texts at a later point of time (Droop & Verhoeven, 2003; Spencer & Oleson, 2008; Oakhill & Cain, 2012). Research states that learners' oral literacy enhances their ability to read. It is in this context that we find it quite intriguing to see and hear their day-to-day narratives about things, objects, persons, events and how they reveal them through their mind.

This particular idea of learners' narratives and what their mind reveals about various things has made us read upon the construct of theory of mind. Another notable enquiry that has driven us to take up this study is the MultiLiLa project (University of Cambridge, 2016-2020) which looks at learners' narrative retelling aspect where young bilingual/multilingual learners simultaneously watch a picture strip of the cat story (MAIN, 2012; 2019) and perform narrative retelling on their own of the story. This retelling of the story, according to the project reports, has provided enough evidence that learners use mental state terms while they narrate events, stories and episodes. This is also evident in children's daily conversation with parents and others (Brown, McCall & Dunn, 1996). The MultiLiLa project (University of Cambridge, 2016-2020) gives more emphasis on what learners can do rather than pointing out their errors and mistakes. A careful scrutiny of the performances of learners on linguistic and cognitive tasks, intervention studies on reading instruction in multilingual contexts are initiated and conducted. The reading instruction is a teacher intervention program where teachers from various states are provided training on the use of multilingual texts and resources in their classrooms to enhance learners' reading ability. These teachers are made aware that learners' ability to reveal their minds about various aspects of everyday life are real and authentic which thereby must and should be utilised as classroom resources in enhancing their reading ability especially word learning and reading comprehension.

We believe that young learners' cognitive and linguistic skills talk a great deal about their developmental stages. Therefore, we have selectively aimed at studying young learners' theory of mind in great detail because studies are relatively very few in the context of India. Even though studies on ToM are available, they did not focus primarily on ToM as the main variable and henceforth, the subject of ToM is not fully explored in subsequent research studies. Most of the works on ToM, especially if we look at their task and test constructs, are available in the western context and henceforth, challenges are relatively high when considering to adopt and administer tasks and tests to the Indian context. For this study, even though we have adopted tasks and tests, careful attention is given on its administration to participants who are mostly bilingual in nature. Additionally, bilingual instructions and explanations are provided whenever it is found necessary to the participants.

METHODOLOGY AND ITS CHALLENGES

The ToM framework elicits children's capability to understand mental states of oneself and others and this is evident through explanation and prediction by the participants who perform tasks that are being administered to them (Wellman & Liu 2004; de Villiers & de Villiers, 2014; Wellman, 2018). Most researchers have used experimental methods to speak volumes about the exact acquisition of ToM in children and from which age; evidences coming from experimental investigations indicate that children normally acquire adult-like ToM sometime between the age of 3 and 4 years (e.g. Perner & Wimmer, 1985). However, there are researchers who have a different take on the age of acquisition of ToM and provide evidence that children can reveal their mind from infancy onwards. Observational studies of children in their families, on the contrary had shown that even very small infants have shown abilities of teasing, comforting, deceiving, helping, joking-behaviours which all thereby have presupposed understanding psychological states of other people (Dunn, 1988; Reddy, 1991; Carlson et al., 2013).

ToM tasks till date have tried to elicit mental states of oneself and others in the aspects of desires, knowledge, beliefs, emotions and intentions (Premack & Woodruff, 1978) but various definitions of ToM do not take the same way, the theory varies from definition to definition regarding the specificities for ToM and the behaviour that are manifested (Premack & Woodruff, 1978; Wimmer & Perner, 1983; Leslie, 1987; Tager-Flusberg & Sullivan, 2000; Abu-Akel & Shamay-Tsoory, 2011; Dennis et al., 2013; Bird & Viding, 2014; Westby, 2014; Asakura & Inui, 2016; Happé et al., 2017). In a review of Self to Other Model of Empathy (SOME), Bird & Viding has reported the definition of ToM and has set the criteria for its inclusion and exclusion of literature (2014). According to them, SOME, a comprehensive model based on empirical data from clinical and neuroimaging studies which distinguishes ToM from empathy. The former defines itself to be responsible for an agent's cognition of oneself and others mental states, whereas the latter is an emotional contagion affected by the exposure to another person's emotion knowing the fact that emotional state is experienced by the other (Bird & Viding, 2014). The model further adds that ToM lacks situational understanding processes based on situational cues (e.g., people dressed black in cemetery = funeral=sadness). This is a very clear distinction as to how ToM can be different from the other social cognitive constructs. However, it is very necessary to distinguish ToM from other abilities that may build or rely on ToM. Many overt behaviours reflecting prosocial and self-promoting which are cooperation, adherence to social norms, lies and manipulative interpersonal tactics, which can be assessed via targeted measures rather than using the measures of ToM (Baurain & Nader-Grosbois, 2013; Slaughter, 2015).

In retrospect to the question on which method best captures theory of mind, a slight indication has been provided in the first paragraph of this section appealing to one of the either -implicit versus explicit tasks. The implicit tasks include- observation methods, behavioural patterns and thereby they are reported; whereas the explicit tasks include various timed, goal-oriented tests that measure specific mental states of children. In the context of explicit tasks, ToM caters to a broad range of mental-states which children learns to express- emotions, knowledge, beliefs, intents, desires- but it appears that the reliance of false beliefs

as a mental state is an over-representative measure. This particular false-belief task was initiated by Wimmer and Perner (1983) and has since been widely used to a range of contexts (Wellman et al., 2001; Hedger & Fabricius, 2011; Hiller et al., 2014). In this paradigm, a short scenario depicting a contradiction between reality and a character's belief are presented to the children, which is called the location change paradigm. For example, the classic Ann and Sally task (Baron-Cohen et al., 1985). Two dolls named Ann and Sally are presented to a child. Sally places her marble in a basket, and then leaves the scene. Ann takes the marble out of the basket and puts it in a box. When Sally comes back the child is asked where she would search for the marble. To achieve the task, the answer by the child has to be- in the basket- despite having known the fact that the marble is in the box. The intention of such scenarios enables the experimenter to determine children's ability in understanding a person's mental state that it is simply not the reflection of reality, but also appears that children are able to perceive a theory of another person's mental content, a theory of mind. Research shows that children are typically able to complete the false belief paradigm tasks with a success rate between 3 and 5 years of age (Wellman et al., 2001). However, a broader variation of methods and measures show that ToM follows a nuanced and more extended developmental trajectory (Wellman et al., 2011).

It has also been documented that ToM abilities are present from infancy (Slaughter, 2015) which sheds a new light on the developmental trajectory of ToM suggesting that they are inherent and shows manifestations with time to time (Chomsky, 1967). Researchers who have documented ToM abilities from infancy have complied implicit methods like observing imitation behaviours, paradigms that violated expectation and tracking of eye gaze showing that children showcased some understanding of intentions of others by 12-18 months of age (Kristen et al., 2011), are able to appreciate others' desires by 18 months of age (Repacholi and Gopnik, 1997; Poulin-Dubois et al., 2007) and can show comprehension of false beliefs exactly around 15 months of age (Onishi and Baillargeon, 2005; Southgate et al., 2007; Senju, 2012). Having documented the tasks, findings, and the results, they are not away from criticisms and debates; some argued that implicit tasks are valid methods to measure (Carruthers, 2013; Powell et al., 2018) whereas others are of the view that implicit tasks lack reliable and valid data to support their use (Dörrenberg et al., 2018; Kulke et al., 2018). In contrast to the implicit methods, explicit methods have found their clear ground in measuring complex tasks of ToM and the results of the these tasks suggest that ToM continues to develop beyond 5 years of age that includes- a child improves his/her ability to comprehend 2nd order false belief tasks (i.e., "Ann thinks that Sally thinks the marble is in the basket") between 5 and 6 years of age, and develop a gradual appreciation of sarcasm, faux pas (social gaffes) and white lies throughout adolescence (Miller, 2009). Studies from neuroimaging also have shown longitudinal changes of patterns in cerebral activation during a host of TOM activities, and suggest protracted development well through adolescence and into adulthood (Blakemore, 2008, 2012). In our study the focus was to investigate young learners' ToM abilities and thereby we have resorted to using explicit tasks because of its reliability, validity and practicality since the sample population is also large.

TASKS USED IN THE STUDY

Table 2. An overview of the tasks included in the study

Narrative Retelling	Reading Ability	Theory of Mind
“The Cat Story”, from Multilingual Assessment Instrument for Narratives	● Letter Reading ● Word Reading ● Paragraph Reading	● False Belief ● Perspective Taking ● Emotions ● Think & Know

Table 2 provides the complete outline of the tasks that were used in the study. These tasks are procured from various empirical studies (Tsimpli et al., 2024; Astington et al., 2002; Pons et al., 2004; Selman, 1973; O'Hare et al., 2009). As outlined in Table 2, we have (a) a narrative retelling task, (b) reading ability task, and (c) theory of mind (ToM) tasks. Along with these tasks, a questionnaire was also administered to the students to procure data on demographic details, language proficiency, reading experience and usage of technological gadgets. In this paper, we are only providing details of tasks respectively, narrative retelling and ToM.

Narrative Retelling Task

Narrative retelling as a task was used to see learners' ability to retell the whole narrative story in proper sequence of what they have heard and seen through these six picture strips in a video format. The main aim of this task is to check learners' story grammar knowledge which consists of goal, attempt, Internal State Terms (IST) as initiating event, outcome, IST as reaction, etc. We expect all these elements of story grammar to be present in their retelling narratives. For the task, we have adopted the CAT story from Multilingual Assessment Instruments for Narratives (MAIN; Gagarina et al., 2019a; Gagarina et al., 2019b). Story narration is available in Appendix A.

Figure 1. The cat story from MAIN - Narrative retelling task

Procedure of Data Collection (NR)



The following describes the procedure we used for conducting the narrative retelling task. The session was conducted individually. Prior to the task, we provided detailed instructions in English and Tamil for English MoI students and in Tamil for Tamil MoI students who were grouped together. We conducted this task in a closed classroom where students came individually and watched the audio-visual story on a digital gadget. While watching the picture strips, an audio clip was also being played picture-wise simultaneously. After they're done watching the story, each participant was asked to retell the story with the aid of the same picture strips which they saw in the computer screen in the form of PPT. This time there was no audio clip for the picture strips. Each participant's retelling narrative was recorded using an android mobile recorder and later the same was transcribed for evaluation. On an average, each participant took 4 to 6 minutes to finish the task. During the task administration, no major issues were faced by the researchers. We tackled some of the minor issues like when students got stuck while retelling the story, they were given prompts- 'okay', 'then', 'tell me more' and 'anything else'. Those language prompts helped the participants to remember the story episodes, events and could complete their narratives.

Assessment of Narrative Retelling Task

As the study focuses on the story grammar, we followed only the scoring patterns of story structure from the MAIN (Refer MAIN, 2019a). As many researchers have been using the MAIN assessment tool, we consider this as a standardised assessment tool. With regard to the story structure, if the participants included goal, attempt, Internal State Terms (IST) as initiating event, outcome, IST as reaction in their retellings, we awarded 1 point for each. If there was no response, we marked Zero.

Theory of Mind (TOM) Tasks

For the theory of mind (ToM) tasks, we have 5 categories. These category tasks are on false beliefs, emotions, perspective taking, and think & know. All the five category tasks are discussed in detail below.

1. False Belief (Astington et al., 2002) - This task assesses whether children can recognise that others can hold beliefs that are different from reality. There are first-order and second-order false belief tasks. First-order false belief tests if a participant can recognise the false belief of others, whereas second-order false belief tests if a participant can understand one's beliefs about what another person believes. The story to assess false belief (1st and 2nd order) is provided in Appendix B.
2. Emotions (Pons et al., 2004) - This task measures emotional understanding of participants. For this task, we narrated a small story using pictorial representation (See Figure 2) from which we asked the participants to identify the emotions of the story character, especially the mixed emotions. The story narration can be seen in Appendix C.

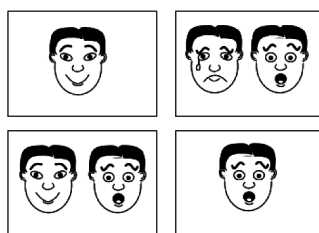


Figure. 2 Emotional understanding task (Pons et al., 2004)

3. Perspective Taking (Selman, 1973) - This task requires participants to understand that others can have different viewpoints. For this task, we narrated a story with pictures (see Figure 3) generated by an artificial intelligence tool. Followed by questions were asked to assess their perspective taking skill. The situation can be seen in Appendix D.

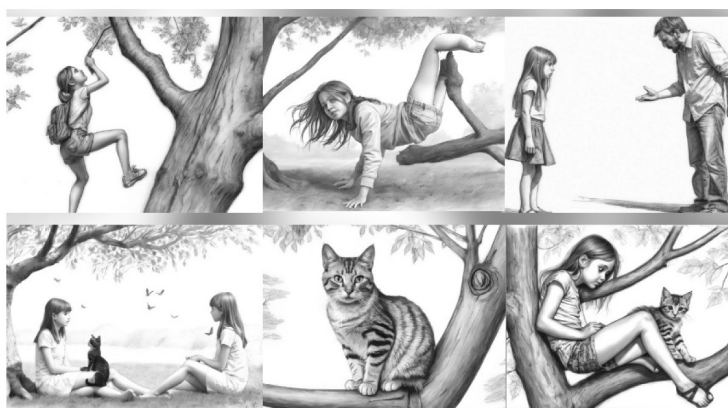


Figure. 3 Perspective taking task (Pons et al., 2004)

4. Think & Know (O'Hare et al., 2009) - This task evaluates the participants' ability to reason about and interpret what others think and know. A story narration was given to the participants for eliciting the participants' understanding of the story character's thoughts and knowledge. The story which is used in the task can be found in Appendix E.

Procedure of Data Collection (TOM)

The procedure followed for administering ToM tasks is outlined as follows. All the 4 tasks were conducted individually. Before we began each task, we clearly gave the participants instructions in Tamil language for both English MoI and Tamil MoI students as we stick on to the native language of the participants for better understanding. When the participants were grouped together, we mainly demonstrated a trial only for two ToM tasks- False belief and Emotions. The aim of giving a trial was to make the participants familiarise the task types which will be similar in nature to the main tasks. For instance, for the trial of emotions tasks, We drew some emojis on a blackboard and asked to mention the emotions. This helped us to familiarise emojis among the participants. For the main task, participants

took 2-4 minutes for each ToM task. Other details regarding the tools used, steps followed and the instructions were provided in the following table.

Table 3. Procedures of ToM Task

S.No	Task	Tools used	Steps followed	Instructions given
1	False Beliefs (1st & 2nd order)	Toys	- Using toys we narrated the story - Questions were asked to test 1st level and 2nd level. We asked 1 justification question also to test their understanding. - Based on their answers, we evaluated them.	- In the beginning, we asked the children to listen to the story carefully - Finally, we asked them questions.
2	Emotions	Pictures & Emoji in Handout	- Showing the picture on we narrated the story - Based on the situation of the character we asked them a question. - For the correct emoji, we offered marks.	- Firstly we asked participants to listen to the situation. - They were instructed to choose the most appropriate emoji among four emojis.
3	Perspective Taking	Representational Pictures in handouts	- We described the story using the handouts. - Questions were posed depending on the story narrated - We checked the answers, correlated with the stages mentioned in the referent study and awarded marks	- Initially, students were asked to look at the pictures and listen to the story carefully. - Participants were asked questions on the incident and directed to think and answer the question
4	Think & Know	Story written handouts	- We read the story by looking at the handouts and used hand gestures when needed. - We asked two questions based on the events that happened in the story. - We evaluated their answers and presented marks	- Primarily we asked the students to follow the sentences that are read by the administrator. - Eventually, we asked the students to answer the questions depending on the story episodes.

During the implementation of ToM tasks, several challenges emerged. One such major difficulty was related to cultural appropriateness and relatable experience. While conducting the perspective taking task, we had to use a word, 'Promise' as per the story content (Selman, 1973). In Indian cultural context, promise is seen and practised as a sacred commitment; breaking a promise is considered as an unforgivable mistake. So we decided to ignore that particular word. This modification facilitated us to collect the responses without any obstacles. In order to make the participants engage in the story we modified the names of the story characters to Indian names which were originally western. These changes made a difference in their involvement.

Assessment of Theory of Mind (TOM) Task

The evaluation of ToM tasks was done based on the understanding of mental states of the story characters presented for the participants. Please refer to table 4 for the scoring scheme. For all the tasks, we set a maximum score of 2. If they have not responded correctly or no response, it was recorded as zero. Only for perspective taking tasks were evaluated based on the stages. If their responses match stage 0 then 0 mark. Similarly for stage 1 - 1 marks and stage 2 - 2 marks. For the rest of the task, if they have given the correct answer, we awarded them 2 marks.

Table 4. Scoring scheme

S.No	Task	Score
1	1st order false belief	0 2
2	2nd order false belief	0 2
3	Emotions	0 2
4	Perspective taking	0 1 2
5	Think & Know	0 2

DISCUSSION AND CONCLUSION

Children are curious about many things and therefore they have their own understanding about things around them whether it be objects, locations, desires, beliefs, emotions, perspectives, intentions, etc. They express their ideas and thoughts on desires, beliefs, emotions, and being able to attempt these mental states based on their knowledge base is what makes research interesting and intriguing. Researchers working in the area of theory of mind (ToM) have volumes to speak about children's mental states and its implications in language and learning. This output of children's mental states in their daily narration of events is eventually the focus of our study too. Much of the research has been conducted in the western contexts but when it comes to Indian contexts, the research is very sparse. It is in this line that we have taken up the topic of ToM and retelling narratives to explore in our respective contexts and see the outcomes. We are very excited about the work and would like to foresee learners' performances in the mentioned variables. This will provide us a ground to stand and see what other aspects or factors might have contributed to children's

performance in the tasks. The contributing factors can be taken up for further studies. As researchers, we are at the beginning stage of our study and henceforth, we are aware of our limitations in the study. However, we would like to make a fair attempt and make our study meaningful in the sub-context of India from where we had collected our data.

One of the main aims of the study is to look at the learners' performance in ToM and retelling narrative tasks which are in progress. But in this paper, we are more concerned about the methodological issues and challenges, and therefore we have so far attempted to highlight them in consultation with the past research works on ToM. Although attempts have been made to see if implicit methods (refer to Bretherton & Beeghly, 1982; Shatz, Wellman, & Silber, 1983; Hood and Bloom, 1979; Dunn, Bretherton, & Munn, 1987) can be used to carry out ToM research, they are mostly longitudinal in nature and are basically case studies which lack generalisation. Again, many claim to the fact that such data lack validity and reliability (Dörrenberg et al., 2018; Kulke et al., 2018). But for our study, we have adopted explicit methods which consist of tests and measurements. Review of tasks have been made and therefore, they are adopted and modified based on the learner's needs and proficiency level. In addition to the task constructs, procedures of data collection have been followed in line with the respective tasks of ToM which were originally administered.

Narrative retelling tasks have been administered in a wide variety of languages to check the proficiency levels of the learners for academic and clinical purposes. However, studies are very sparse which actually tried to correlate retelling narratives and ToM. In our study, we administered both the tasks to bilingual learners and would like to investigate if ToM has an effect on retelling narratives and vice versa. Our population groups are not without challenges. One group speaks Tamil as their L1 and their MoI is also Tamil, while the other group's L1 is Tamil but their MoI is English. We are also very hopeful to see the diverse outcomes in terms of how language will play a role in the learners' performances in both the tasks. Research on ToM, especially false belief tasks in the western context supported the fact that learners who are good at second and third level false belief tasks are good at language comprehension and therefore are also good at oral production (de Villiers & de Villiers, 2014). Since our learners are also of the same age groups, we expect to see comparable results which would provide us with the evidence of their linguistic and cognitive development in language per se.

DECLARATION OF INTEREST

No potential conflict of interest was reported by the author(s)

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Appendices

Appendix A (English & Tamil version)- Narrative retelling task (The CAT Story)

One day there was a playful cat who saw a yellow butterfly sitting on a bush. He leaped forward because he wanted to catch it. Meanwhile, a cheerful boy was coming back from fishing with a bucket and a ball in his hands. He looked at the cat chasing the butterfly.

The butterfly flew away quickly and the cat fell into the bush. He hurt himself and was very angry. The boy was so startled that the ball fell out of his hand. When he saw his ball rolling into the water, he cried: "Oh no, there goes my ball!". He was sad and wanted to get his ball back. Meanwhile, the cat noticed the boy's bucket and thought: "I want to grab a fish."

At the same time the boy began pulling his ball out of the water with his fishing rod. He did not notice that the cat had grabbed a fish. In the end, the cat was very pleased to eat such a tasty fish and the boy was happy to have his ball back.

ஒரு நாள் ஒரு விளையாட்டுப் பூனை முள் செடியில் உட்கார்ந்திருந்த மஞ்சள் நிறப்பட்டாம்பூச்சியை பார்த்தது. அந்த பூச்சியை பிடிப்பதற்காக அது முன்னாடி குதித்தது. அப்பொழுது ஒரு பையன் மீன் பிடித்து விட்டு கையில் பக்கெட்டும் பந்தும் எடுத்துக்கொண்டு உற்சாகமாய் வந்தான். பூனை அந்த பூச்சியை துரத்துவதை அவன் பார்த்தான்.

பட்டாம்பூச்சி வேகமாக பறந்து போனது. பூனை முள் செடிக்குள் விழுந்தது. அதற்கு அடிபட்டது. பூச்சியை பிடிக்க முடியாததால் பூனைக்கு ரொம்ப கோபம் வந்தது. இதை எல்லாம் பார்த்த பையன் பதறி/பயந்து போனதால் அவன் கையில் இருந்து பந்து கீழே விழுந்தது. அவனுடைய பந்து தண்ணீருக்குள் உருண்டு போவதைப் பார்த்து அவன், 'அச்சோ போச்சே! என் பந்து போச்சே' என்று கத்தினான். அவன் சோகமாகிவிட்டான். அவனுடைய பந்து அவனுக்கு திருப்பி வேண்டும் என்று நினைத்தான். அப்பொழுது அந்த பூனை பையனுடைய பக்கெட்டை பார்த்து யோசித்தது. "எனக்கு அதில் இருக்கும் மீனை எடுக்கணும் என்று ஆசையாய் இருக்கே!"

அதே நேரத்தில் பையன் அவனுடைய பந்தை மீன் பிடிக்கும் கம்பியை வைத்து தண்ணீரிலிருந்து இழுக்க ஆரம்பித்தான். பூனை அவன் பக்கெட்டில் இருந்து மீனை எடுத்ததை அவன் பார்க்கவே இல்லை. கடைசியில் பூனை அவ்வளவு ருசியான மீனை சாப்பிட்டதால் சந்தோஷமானது அந்த பையனும் அவனுடைய பந்து திருப்பி கிடைத்ததால் சந்தோஷமாகிவிட்டான்.

Appendix B- ToM tasks (False belief)

This is a story about two friends, Jason and Lisa. This is Jason and this is Lisa. They are playing in Jason's room. Jason has a letter from his friend, Susan. Lisa really wants to know what the letter says but Jason does not want her to read it. Jason's mom calls him. Jason puts the letter under his blanket and leaves the room. While Jason is gone, Lisa takes the letter and reads it. Then she puts it away in Jason's desk. But Jason finishes talking to his mom and comes back. He sees Lisa putting the letter on the desk. Jason watches Lisa, but Lisa does not see Jason.

Appendix C- ToM task (Emotion)

Tom is looking at the new bicycle that he just got for his birthday. But at the same time, Tom thinks he might fall off and hurt himself because he has never ridden a bicycle before.

Appendix D- ToM task (Perspective Taking)

Holly is an 8-year old girl who likes to climb trees. She is the best tree climber in the neighbourhood. One day while climbing a tree she falls off the bottom branch but does not hurt herself. Her father sees her fall, and is upset. He asks her to promise not to climb trees anymore, and Holly promises. Later that day, Holly and her friends meet Sean. Sean's kitten is caught up in a tree and cannot get down. Something has to be done right away or the kitten may fall. Holly is the only one who climbs trees well enough to reach the kitten and get it down, but she remembers her promise to her father.

Appendix E- ToM task (Think & Know)

A burglar who has just robbed a shop is making his getaway. As he is running home, a policeman on his beat sees him drop his glove. He doesn't know the man is a burglar, he just wants to tell him he dropped his glove. But when the policeman shouts out to the burglar, "Hey you, Stop!" The burglar turns round, sees the policeman and gives himself up. He puts his hands up and admits that he did the break-in at the local shop.

SRI AUROBINDO'S INTEGRAL EDUCATION: ITS RELEVANCE IN THE 21ST CENTURY

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ABSTRACT

Consumerism along with hedonism is so rampant in the 21st century that we do not feel any pangs to owe moral obligations for our deeds as it simply satisfies our desires of enjoyment in life. The present-day crisis of hedonism is not a problem of our country alone; rather it encompasses the whole of mankind, making it a global phenomenon. All-pervading corruptions, lack of discipline, abuse of power, extremism, etc. have become the norm of the day; prudence has been forgotten, justice is being denied in every possible way. Thus, to prevent the proliferation of evil we have to revisit and review our ancient and modern systems of education. This will not only enrich us in our academic endeavour but also integrate our whole being and cover all the aspects of human efforts in a comprehensive way. This is exactly what Sri Aurobindo's concept of Integral Education enunciates. We have to adopt and adapt this educational thoughts for the benefit of our future generations and offer them a plausible ideal education system which is neither a mere copy of our past system nor that of the West; but an assimilation of essences from the available systems of education. Hence, for the blooming of children through a perfect development we have to train and nourish the elements of one's body, emotion, mind, psychic and the spirit, if we really want to ameliorate the social and ethical problems causing a 'crisis of civilization'.

Keywords: Integral Education, Brahmacharya, Antara Drishiti, Samaskaras.

INTRODUCTION

Aurobindo Ghosh (1872-1950), later Sri Aurobindo, appealed before the students and teachers of the Bengal National College, presently known as Jadavpur University, as the first the Principal of the college during his farewell speech on the 23rd August, 1907 stating—

What we want here is not merely to give you a little information, not merely to open to you careers for earning a livelihood, but to build up sons for the motherland to work and to suffer for her...

When I come back I wish to see some of you becoming rich, rich not for yourselves but that you may enrich the Mother with your riches...

You will go abroad to foreign lands that you may bring back knowledge with which you may do service to her.¹

1 Sri Aurobindo Birth Centenary Library: Volume 1.- Bande Mataram: Early Political Writings. 1890 - May 1908.- Pondicherry: Sri Aurobindo Ashram, 1973.- 920 p.

At present we generally believe that possessing of certificates is essential for employment and professional growth. This gives rise to consumerism which engulfs our present-day life for which no one does hesitate to throw away morality as it simply satisfies our instincts of enjoyment in life. But great men do aspire for higher goals of life in the evolutionary process of mankind. Sri Aurobindo is a case in point. He has categorically warned us that only consideration of earning more money and focussing on professional growth and thereby ignoring comprehensive growth of the child and disinterested aspiration for wisdom and knowledge, do pay much in future. He says:

*We in India have become so barbarous that we send our children to school with grossest utilitarian motive unmixed with any disinterested desire for knowledge, but the education we receive is itself responsible for this. So we are sending our children to schools with glossed utilitarian motive without considering the entire growth of a child. Cramming the brains of a child is not desirable.*²

The present-day crisis has not only been felt in our country but also in other countries as well. It encompasses the whole of mankind, irrespective of the space and race. The present-day corruption, lack of discipline, exercise of abuse of power, extremism, etc. have become the norm of the day; justice is being denied to poor people in all possible way. Amidst this encircling gloom, Sri Aurobindo's concept of integral education offers us a glimmer of hope in the barren field of educational wasteland. Hence, it is necessary to study Sri Aurobindo's concept of education and its relevance in today's world.

OBJECTIVES

- 1) To discuss the foundations of Integral Education of Sri Aurobindo
- 2) To understand the duties of parents and the teachers in Integral Education
- 3) To study the role of the teaching of physical, vital, mental, psychic & spiritual beings of a human in Integral Education

RESEARCH QUESTIONS

- 1) What are the foundations of integral education of Sri Aurobindo?
- 2) What are the duties of parents and the teachers in integral education?
- 3) What is the role of the teaching of physical, vital, mental, psychic & spiritual beings of a human in integral education?

MEDHODOLOGY

To conduct the present study qualitative method has been used. The procedure includes study of source books, reviews of source books, and articles of other educationists. Data have been collected, processed and arranged after an intensive study of relevant data.

2 The complete works of Sri Aurobindo: Volume 1.- Early Political Writings.(On Education:Part-III) 2003 - Sri Aurobindo Ashram Publication Department.- 358 p.

ANALYSIS & INTERPRETATION

The analysis and interpretation of data are carried out in accordance with the respective research questions and keeping in mind the objectives of the case study.

R-1: What are the foundations of Integral Education of Sri Aurobindo?

In ancient times our forefathers had laid emphasis on Brahmacharya, the strict discipline through which a child was being grown up comprehensively. This Vedic system of education stressed on the development of the physical unit to the intellectual entity and from intellectual to the spiritual being of the Self. They believed that man's basal physical unit is 'Retas' which is to be transformed to 'Tejas' and gradually from Tejas to 'Vidyut' and from 'Vidyut' to 'Ojas' through concentration of mind. Through this process of refinement of the force, latent in human being, the crude force in the being, is refined and placed at the service of the brain which ultimately gives birth to spiritual knowledge.

If we ponder over our ancient education system we can find that through the programme of Brahmacharya students or disciples of those days acquired refined energy, coming out through concentration of mind, employed it at the service of the brain of human body and had been successful in the performance of the academic disciplines like, memory, judgement, power of comprehension, creativity, reasoning, dealing with others in social matters etc. But it is not possible at this present socio-politico-cultural scenario. We have to work hard for the benefit of our loving generations to come and offer them an ideal education system which is neither a mere copy of our past nor of that of the West but taking essence from the ideal systems of education impartially from other sources; and this system of education should be used for proper grooming of Indians to fit in well in modern society. Sri Aurobindo reiterates:

It is not our contention that the actual system of ancient instruction should be restored in its outward features, - a demand often made by fervid lovers of the past. Many of them are not suited to modern requirements. But its fundamental principles are for all time and its discipline can only be replaced by the discovery of a still more effective discipline, such as European education does not offer us.³

R-2: What are the duties of parents and the teachers in Integral Education?

Interestingly, what have been recommended in the prescriptions by the Government of India through the National Curriculum Frame Work- 2005 and National Education Policy-2020 had already been pointed out by Sri Aurobindo long before regarding the outlook of the teachers and the parents.⁴ We, the seniors, the operators, the policy makers including executors have to change and modulate our vision when we deal with education in India. This is how Sri Aurobindo addressed these issues—

3 Sri Aurobindo, Early Cultural writings, p.378/ SABCL, Vol-3 (The Brain of India), p.340

4 The complete works of Sri Aurobindo,, Vol-1, On Education, p. 184

The first principle of true teaching is that nothing can be taught. The teacher is not an instructor or taskmaster, he is a helper and guide. His business is to suggest and not to impose. He does not actually train the pupil's mind, he only shows him how to perfect his instruments of knowledge and helps and encourages him in the process. He does not impart knowledge to him, he shows him how to acquire knowledge for himself.

The second principle is that the mind has to be consulted in its own growth. The idea of hammering the child into the shape desired by the parent or teacher is a barbarous and ignorant superstition.

The third principle of education is to work from the near to the far, from that which is to that which shall be.⁵

Hence, the teachers including parents are the persons who will execute the philosophy into practice. The mental being offers thoughts; the emotional being gives us feelings; the vital being generates the energy of action and the physical being completes the actions. These elements of human endeavours cannot be underestimated and neglected; their functions have to be organised and modulated. We have to integrate and focus on these five principal actions of a man viz., Physical being, Vital being, Mental being, Psychic being and Spiritual being if we aspire for the all-round growth of a child; otherwise, in spite of having excellent educational qualifications and successful professional life, the cases of rampant corruption by qualified persons, inhuman torture by dignified personalities, media violence by educated mass, violence in intimate relationships even at elite societies, abetting suicide by reputed professionals, cheating on others by well-educated individuals etc. will go beyond the limit. Hence, for the blooming of the child through a perfect development we have to train and nourish the elements of one's body, emotion, mind, psychic and the spirit, if we really want to eradicate the social and ethical problems causing crisis which will be a pronounced threat to the evolution of humanity in near future.

R-3: What is the role of the teaching of Physical, Vital, Mental, Psychic & Spiritual Beings of a human in Integral Education?

Sri Aurobindo has given us a methodology comprising of the development of the physical, vital, mental, psychic and spiritual beings for the comprehensive and integral approach in education which is popularly known as Integral Education. Let us now discuss the components of Integral Education in detail:

Physical Education

- Control & discipline of the functioning of the body;
- An integral, methodical & harmonious development of all the parts and movements of the body;
- Correction of any defects and deformities.

a) Need of the Body and Food Habit

- Food - simple & healthy & appetizing;

⁵ The complete works of Sri Aurobindo,, Vol-1, On Education, p. 184

- Eat according to his hunger;
- Eat in order to give strength and health;
- Food for hygiene and cleanliness;
- Food according to the age of the child;
- Food for the balanced growth of body.

b) Importance of Sleep

- Sufficient number of hours of sleep;
- Child should sleep longer than it remains awake until maturity, it should not be less than eight hours;
- Never be made to stay up late for no reason. The hours before midnight are the best for resting the nerves.

c) Import of Health and cleanliness

- To observe cleanliness and hygienic habits;
- To develop and to respect health;
- To be ill is a sign of weakness.

d) Importance of Games and Sports

- Physical exercise for regular development;
- Everyday some 20/30 minutes on walking;
- Medicine should not be used unless it is absolutely necessary.

Vital Education

The Vital being is the life force of a man which is the source of dreams, imaginations and plans. In fact, it acts without discipline. It tends to give up all reasonable standards and it only obeys satisfaction of his ego. But sometimes two opposite tendencies are usually found in one identity. Sometimes one is extremely courageous whereas other times he becomes very coward. Sometimes a generous person becomes wicked in nature. Therefore, proper training is required, so as to cultivate and nourish the muscles of the vital being for the well-being of the society. Cultivation of discrimination and development of aesthetic sense right from the early age of a child are essential. Sense organs are the ministers of knowledge. To differentiate the good and the bad, beautiful and ugly, harmful elements and healthy substance are required from the developing stage of the man, for which story-telling, narrating, practices of different forms of arts, historical descriptions, etc. should be introduced artistically and scientifically; not for making them as artists but to assist them to portraying their own lives in the eyes of an artist.

Mental Education

The mind consists of four layers. The Mind receives thought impressions from outside and from within. After receiving some images, it translates these into thought-sensations and

accordingly actions have been taken at the instance of the brain. The brain consists of two hemispheres – left hemisphere, the functions of which are linear, logical and intellectual and right hemisphere, the functions of which are artistic, creative and intuitive. To develop the full potential of a child, we must make our education system for the growth of both the hemispheres of the brain as this brain is supposed to be the medium by which we educate our mind. Mind is of four different faculties viz., *Manas* i.e. the thinking process, *Buddhi* i.e. intellectual power, *Chitta* i.e. the storehouse of knowledge and *Ahamkara* i.e. self-impression. In present day education, we only deal with the 2nd layer of the mind (Buddhi), disrespecting other aspects of the mind. Here, we make a mistake. We are only in need of a degree or a certificate which is the passport for securing a job for status and recognition but ignore the education and training of other faculties of the mind to become a complete man. Therefore, through education we must allure a child towards a better and nobler life. Hence, the duty of the student is:

- 1) To love to learn is the most precious gift;
- 2) To develop a taste for healthy reading;
- 3) To develop a taste for real study & habit of a persistent effort to know;
- 4) To develop the power of concentration, observation, reading & memory;
- 5) To control & reject undesirable thoughts and to develop mental silence.

Psychic and Spiritual Education

Psychic centre of our being is the hidden seat within us and it is the unfathomable truth of light that shines and guides the individuals at every step of their life. What the thinking mind does not realise and cannot do, this psychic centre realises and does. Besides Sri Aurobindo, Swami Vivekananda too believed that concentration of mind plays a formidable role in the life of a growing child. That is why Swamiji has given so much importance to the practice of concentration especially during the formative period of man's life, saying:

*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, 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 collect facts at will.*⁶

The psychic exercise leads the growing child towards the development of a full-fledged human being. Sri Aurobindo's dictum '*Nothing can be taught*' is the key sentence for the future followers. It may be called as self-education which is essential in the present context of life. Self-education, so to say, improves self-realisation which ultimately enhances the power of intuition and creativity. Advices, impositions, dogmas, do's and don'ts do not make noticeable impact in the life of young learners but when his self-guidance controls his behaviour he does not make himself involved in any of the unwanted and illegal activity; and this is the ultimate need for the building of society. In this way Sri Aurobindo guides us in this transition to progress ahead, in the journey to the next evolutionary stage. The illuminating

6 Vivekananda S., The Complete works of Swami Vivekananda, Vol.6, Lectures and discourses

light of the psychic not only harmonizes all the faculties of the being but also exceeds his ego-centric surface vitality for an all-inclusive transformation. This is beautifully captured in the words of Sri Aurobindo:

*...that the true secret, whether with child or man, is to help him to find his deeper self, the real psychic entity within. That, if we ever give it a chance to come forward, and still more if we call it into the foreground as "the leader of the march set in our front", will itself take up most of the business of education out of our hands and develop the capacity of the psychological being towards a realisation of its potentialities of which our present mechanical view of life and man and external routine methods of dealing with them prevent us from having any experience or forming any conception.*⁷

FINDINGS

We have to do something positive for our generations to come, which will be unique and useful to them. What Swami Vivekananda has taught that even with the help of introducing an ideal police system, we cannot do away with the evil forces of society; so we have to prevent the very genesis of evil with the intervention of an ideal nourishment to the new generations. What we can do best is to open the gates of positivity in their lives. The question that strikes the conscious people repeatedly is that why even after possessing good credentials the so-called educated mass indulges in present-day corruptions, misuse of power, extremism, etc. To prevent the very birth of evil we have to revisit and review the systems of education impartially which not only enriches us in the academic field but also integrates our whole being and covers all the aspects of human endeavours in a most comprehensive way. Viewed in this light, Sri Aurobindo's notion of Integral education can offer us a panacea to ameliorate the burgeoning problems in our modern education.

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⁷ Sri Aurobindo, *The Human Cycle*, p.33

ATTITUDE TOWARDS TRANSGENDER PEOPLE IN INDIA AND BANGLADESH: A COMPARATIVE STUDY

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ABSTRACT

Transgender population are highly increasing day by day. Similarly, in several south Asian countries the population also increased largely. Transgender people faced so much vulgarism from the orthodox society. Though there are several government policies that are provided for transgender people to preserve their basic rights, those policies are not implemented fully. This comparative study's main goal is to ascertain how young people in Bangladesh and India feel about transgender people. Exploratory survey research is used in this study. This comparative study employs a quantitative research methodology. There are 400 samples in all. The pertinent data came from young people in Dhaka, Bangladesh, and Kolkata, India, who were between the ages of 15 and 24. Purposive sampling was used as a method. The data was collected from Kolkata, India, and Dhaka, Bangladesh. The information was gathered using a self-made 5-point Likert-type attitude scale. The overall data was analysed through quantitative analysis, non-parametric test like the Chi square test was used. To check the normality, Kolmogorov-Smirnov and Shapiro-Wilk Kruskal- Wallis were used. The findings revealed that there was a widespread confusion or misunderstanding regarding sexual orientation and a positive indicator of acceptance for transgender people among the youth in both countries. The study also revealed that a deep-rooted socio-economic stereotype concept prevalent among young people which indicate a cognitive barrier to inclusion. Most of the respondents from India and Bangladesh expressed their positive curiosity and willingness to learn about transgender people to understand them better. Therefore, most of the young respondents from India and Bangladesh showed their negative attitudes towards accepting transgender people as life partners. The study concluded that in order to encourage inclusion, people should become more knowledgeable about transgender issues.

Keywords: Attitude, Youth, Transgender People, Comparative Study.

INTRODUCTION

The world is changing rapidly due to technology. Additionally, it is changing people's lives all over the world. Because of prejudice, ignorance, and traditional beliefs, a few particular groups, individuals, and communities are consequently marginalized in many parts of this evolving world. The transgender community is also impacted by social, economic, educational, and psychosexual marginalization. People who identify as transgender represent all racial, ethnic, and religious backgrounds and come from all walks of life. The sex that was assigned to them at birth does not correspond with their gender identity, gender expression, or behavior. "Trans" is an acronym that represents transgender. A woman who identifies as

female but was born with a male gender identity is known as a transgender woman. A person who identifies as a man but was labeled female at birth. Some transgender people who desire medical assistance to transition from one sex to another identify as transsexual. There is a distinction between the terms “transgender” and “intersex.” Intersex people are individuals born with physical sex characteristics that do not fit the typical definition of male or female bodies. (Source: <https://share.google/1CO0q7Xo6mlspxj4B>). Though there are several government policies and laws that provide for their rights, those policies are actually not implemented fully in many regions of several South Asian countries. Transgender individuals are those whose internal, innate perception of their own gender does not correspond rather than their biological sex assigned at birth. The honourable Supreme Court of India recognized transgender as “Third Gender,” upholding their rights to self-identity as male, female, or transgender without requiring medical testing or surgery. In India, there are several government policies available for transgender people to protect their rights, such as the Transgender Persons (Protection of Rights) Act, 2019; the Transgender Persons (Protection of Rights) Rules, 2020; the National Portal for Transgender Persons; the SMILE Scheme; and the National Council for Transgender Persons. The government of Bangladesh takes a number of actions to safeguard the rights of transgender individuals. As a result, in some parts of Bangladesh, those initiatives are not entirely applicable. Even so, they are not appropriately accepted by society. People who identify as third gender do not, therefore, live freely, with full dignity, and with respect. The best way to eradicate this vulgarity from traditional society and enable them to reach their full potential is through education. In South Asian countries, the number of transgender people is increasing daily in addition to the general population. It is therefore vital to grant them all fundamental or basic rights. Bangladesh was a part of British India before the 1971 liberation war. Following its liberation war, Bangladesh attained independence. In Bangladesh, people who identify as transgender are called Hijra. The Hijra community experiences marginalization all of their lives. In 2014, the Bangladeshi government recognized Hijra as a third gender and granted them some rights. Education also elevates a diverse community’s status in society. Transgender individuals make up a diverse community. In several South Asian countries, including India, transgender people now have legal recognition due to the 2014 NALSA Act. Through this law, prohibition of discrimination in education, employment and healthcare is provided. In Bangladesh, the government of Bangladesh recognized hijra as a third gender on 11 November 2013 (**Human Rights Watch, 2016**). The country’s mainstream development program must include the transgender community in addition to protecting from all forms of exploitation and mistreatment. Studies on transgender people have been carried out in large numbers. Because of this, research on the public’s perception of transgender people is extremely rare. The current study is necessary to explore and bridge the gap. It is necessary to complete the current study. The primary objective of this study is to find out how young people in both countries feel about transgender people.

LITERATURE REVIEW

The research study conducted by Botor et al. (2025) to investigate the role of alcohol use severity in the link between attitudes and microaggression perpetration toward sexually and gender-diverse individuals. The study focused on the relationship between attitudes and microaggression toward lesbian, gay, bisexual, and transgender individuals. The researchers found positive bivariate correlations between negative attitudes, alcohol use severity, and microaggressions. Shabbir et al. (2025) in their paper gender diverse identity and social acceptance in conservative societies, discovered that a two-part generalized linear regression-based moderation analysis showed that alcohol use severity significantly exacerbated the relationship between negative attitudes toward LGBT people and the degree, but not the probability, of engaging in both SO and GI microaggressions. In conservative societies, the connection between gender-diverse identities and social acceptance was investigated. They discovered that non-conforming and diverse gender identities were not well accepted among older adults. In order to better understand the current state of knowledge, health-seeking behavior, attitudes, and typical practices of university students with regard to sexual and reproductive health, Kalam (2024) gathered a variety of data for his study to assess the knowledge, attitudes, and practices of sexual and reproductive health among undergraduate students in Bangladesh. Nonetheless, it was discovered that younger and more educated respondents had a high degree of acceptance of divers' gender identities. Undergraduate university students were given a structured questionnaire using a Google Form. Non-discriminative snowball sampling was used in this study. The study found that parents and siblings don't communicate well about the SRH program. Most pre-university students had no access to the SRH program. Sexual harassment was reported by most participants in both public and private universities. Maji et al. (2024) in their paper just world belief, religiosity, and attitudes towards homosexuality: a study of Indian engineering students, report that most victims of sexual harassment failed to report these issues to the university administration due to mistrust. Views on homosexuality, religion, and worldview: A quantitative survey-based study was conducted to learn how Indian engineering students felt about homosexuality. Male and female engineering students had different views about homosexuality. Compared to their male counterparts, the researchers discovered that heterosexual female engineering students had a more accepting view of homosexuality. The study discovered that friends' acceptance of homosexuality, just-world beliefs, mother's level of education, and fandom for LGBTQ celebrities all significantly predicted the participants' attitudes toward homosexuality ($p < .05$). They found that students' degree of religiosity did not significantly predict their views on homosexuality. In their study, "Awareness and attitude of medical personnel in Kerala, India, to transgender persons," Fenn et al. (2023) in their study awareness and attitude of medical personnel in Kerala, India to transgender persons, evaluated the knowledge of 452 medical professionals and students in Kerala about the attitudes, problems, and health of transgender people. This implies that a person's response to LGBTQ celebrities can be predicted by their attitudes toward homosexuality. To measure transphobia awareness, attitude, and severity, the researchers employed a scale. The study found that there was an average level of general knowledge about the transgender community, low awareness of health-related issues pertaining

to transgender people, and a moderate level of transphobia. Male medical students were less likely to experience transphobia than male physicians in practice.

HYPOTHESES

H :1	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement - same right of transgender people in society with respect to cognitive component
H :2	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement - transgender people are always mentally disturbed with respect to cognitive component
H :3	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement - transgender people are homosexuals with respect to cognitive component.
H:4	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – nothing wrong in being transgender with respect to cognitive component.
H :5	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – transgender people belong to lower Socio-economic group with respect to cognitive component.
H :6	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – transgender people are violent and aggressive with respect to cognitive component.
H:7	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – Gender presentation is disgusting with respect to cognitive component.
H:8	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – Desire to learn about transgender with respect to cognitive component.
H:9	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – transgender people cannot be friends with respect to affective component.
H:10	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – like to invite transgender people as guest in family with respect to affective component.
H :11	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – transgender people are not accepted as life partner with respect to affective component.

H :12	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – like to accept transgender people as business partner with respect to affective component.
H:13	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – accept transgender people as employee with respect to affective component.
H:14	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – feel embarrassed to be close of transgender persons with respect to affective component.
H:15	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – transgender people need psychiatric assistance with respect to affective component.
H :16	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – like everyone, transgender people choose alternative lifestyle with respect to affective component.
H :17	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – Quitting the place immediately after seeing the transgender person with respect to behavioural component.
H :18	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – Should not tease transgender person with respect to behavioural component.
H :19	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – Elect transgender person if they stand for voting with respect to behavioural component.
H:20	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – Neglect them as curse with respect to behavioural component.
H :21	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – Parents should neglect transgender people as offspring with respect to behavioural component.
H:22	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – Transgender People are mostly act as agents of commercial sex workers with respect to behavioural component.
H:23	There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – Transgender people live sexually free life with respect to behavioural component.

METHODOLOGY

Statement of the Problem: What is the attitude of youth people towards transgender people in India and Bangladesh: A comparative study.

Research Type: In this study, an exploratory survey type of research approach is used. The mixed research method is also employed.

Population: Young people from India and Bangladesh was selected as the population.

Sample: The youth under the ages between 15-24 years (200 Boys and 200 Girls) from Kolkata and Dhaka was considered as a sample for the study.

Sampling Technique: Samples were collected through the random sampling technique.

Tools: The researcher developed a Likert type 5-point attitude scale based on three components – Cognitive, Affective and Behavioural to find out the level of attitude of youth towards transgender people. There are two types of statements - Positive and Negative

Reliability and Validity of the Tools: The research tools are reliable. Cronbach-Alpha was employed to assess the reliability of the tools. The reliability values are Cognitive - .79, Affective - .80, and Behavioural - .80. A panel of six experts from India and Bangladesh evaluated the content validity.

Data Collection: A quantitative analysis was administered on the gathered data.

Data Analysis: The data were analyzed quantitatively. For quantitative data analysis, non-parametric test like the Chi square test was used. To check the normality, Kolmogorov-Smirnov and Shapiro-Wilk Kruskal- Wallis were used.

Delimitations of the study

- (1) The present study is delimited only transgender individuals (men and women) from India (Kolkata) and Bangladesh (Dhaka).
- (2) The study is delimited only to attitude of youth towards transgender people.
- (4) The study is delimited youth (14 – 25, according to United Nation).

RESULTS

Attitude of Youth people towards Transgender in India and Bangladesh in respect of cognitive component

Hypothesis – 1

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement - **same right of transgender people in society** in respect of cognitive component.

The statistical procedure used here is the chi-square as non- parametric statistical interpretation.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	116.836	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 116.836 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - same right of transgender people in society in respect of cognitive component.

Hypothesis – 2

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement - **transgender people are always mentally disturbed** in respect of cognitive component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	144.49	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 144.49 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - transgender people are always mentally disturbed in respect of cognitive component.

Hypothesis – 3

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement - **transgender people are homosexuals** in respect of cognitive component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	52.986	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 52.986 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - transgender people are homosexuals in respect of cognitive component.

Hypothesis – 4

There is no significant difference in level of attitude between youth of India and

Bangladesh regarding the statement – **nothing wrong in being transgender** in respect of cognitive component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	67.715	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 67.715 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - nothing wrong in being transgender in respect of cognitive component.

Hypothesis – 5

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **transgender people belong to lower Socio-economic group** in respect of cognitive component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	106.926	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 106.926 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - transgender people belong to lower Socio-economic group in respect of cognitive component.

Hypothesis – 6

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **transgender people are violent and aggressive** with respect to cognitive component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	130.245	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 130.245 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - transgender people are violent and aggressive with respect to cognitive component.

Hypothesis – 7

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **Gender presentation is disgusting** with respect to cognitive component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	177.497	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 177.497 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - Gender presentation is disgusting with respect to cognitive component.

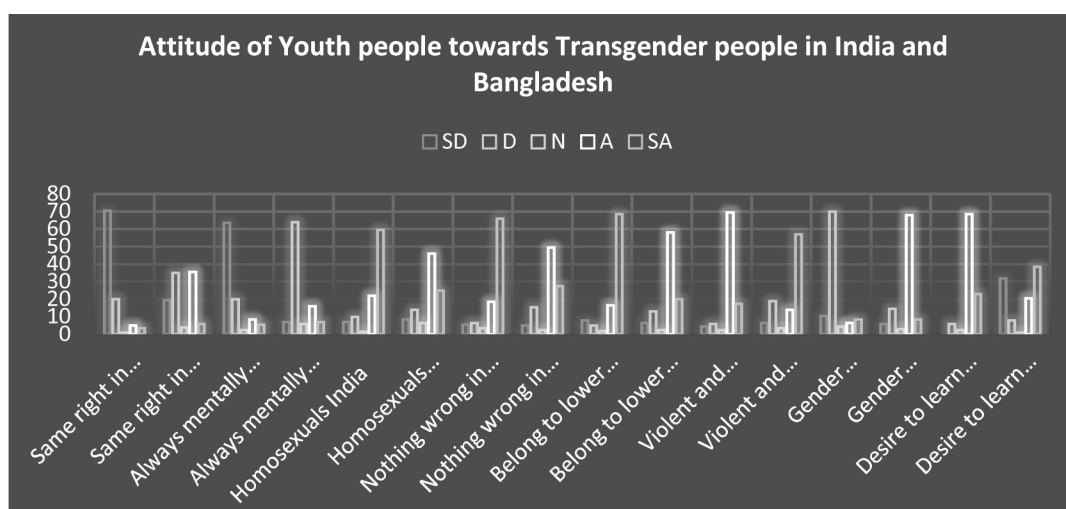
Hypothesis – 8

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **Desire to learn about transgender** with respect to cognitive component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	125.445	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 125.455 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - Desire to learn about transgender in respect of cognitive component.



**Attitude of Youth people towards Transgender
in India and Bangladesh in respect of affective component**

Hypothesis – 9

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **transgender people cannot be friends** with respect to affective component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	43.203	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 43.203 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - transgender people cannot be friends in respect of affective component.

Hypothesis – 10

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **like to invite transgender people as guest in family** with respect to affective component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	137.278	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 137.278 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - Like to invite transgender people as guest in family with respect to affective component.

Hypothesis – 11

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **transgender people arenot accepted as life partner** with respect to affective component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	169.822	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 169.822 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh

regarding the statement - Transgender people are not accepted as life partner with respect to affective component.

Hypothesis – 12

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **like to accept transgender people as business partner** with respect to affective component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	96.371	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 96.371 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - Like to accept transgender people as business partner with respect to affective component.

Hypothesis – 13

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **accept transgender people as employee** with respect to affective component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	131.513	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 131.513 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - accept transgender people as employee in respect of affective component.

Hypothesis – 14

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **feel embarrassed to be close of transgender persons** with respect to affective component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	143.194	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 143.194 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh

regarding the statement - feel embarrassed to be close of transgender persons with respect to affective component.

Hypothesis – 15

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **transgender people need psychiatric assistance** with respect to affective component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	115.678	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 115.678 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - transgender people need psychiatric assistance with respect to affective component.

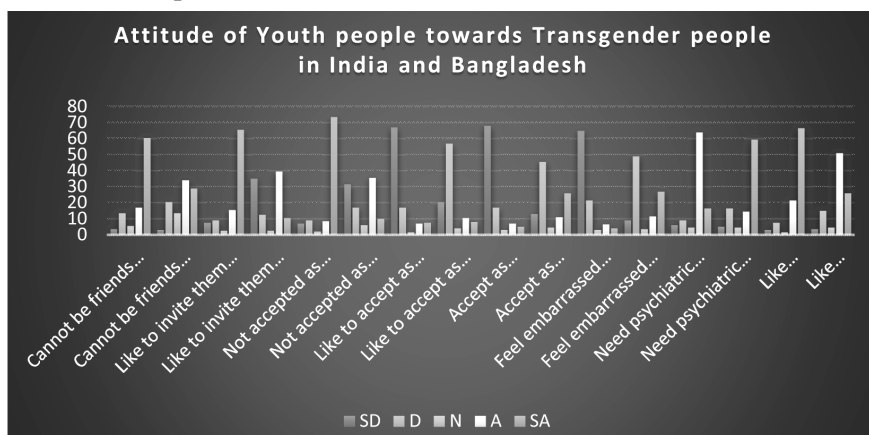
Hypothesis – 16

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **like everyone, transgender people choose alternative lifestyle** with respect to affective component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	67.549	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 67.549 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - like everyone, transgender people choose alternative lifestyle with respect to affective component.



**Attitude of Youth people towards Transgender
in India and Bangladesh in respect of behavioural component**

Hypothesis – 17

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **Quitting the place immediately after seeing the transgender person** with respect to behavioural component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	67.423	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 67.423 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - Quitting the place immediately after seeing the transgender person with respect to behavioural component.

Hypothesis – 18

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **Should not tease transgender person** with respect to behavioural component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	55.196	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 55.196 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - should not tease transgender person with respect to behavioural component.

Hypothesis – 19

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **Elect transgender person if they stand for voting** with respect to behavioural component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	150.54	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 150.54 is greater than the table value ($P.05 = 9.488$). The inference drawn is that

there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - Elect transgender person if they stand for voting with respect to behavioural component.

Hypothesis – 20

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **Neglect them as curse** with respect to behavioural component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	146.517	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 146.517 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - Neglect them as curse with respect to behavioural component.

Hypothesis – 21

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **Parents should neglect transgender people as offspring** in respect of behavioural component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	126.111	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 126.111 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - Parents should neglect transgender people as offspring with respect to behavioural component.

Hypothesis – 22

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **Transgender People are mostly act as agents of commercial sex workers** with respect to behavioural component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	72.02	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi

square value 72.02 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - Transgender People are mostly act as agents of commercial sex workers with respect to behavioural component.

Hypothesis – 23

There is no significant difference in level of attitude between youth of India and Bangladesh regarding the statement – **Transgender people live sexually free life** with respect to behavioural component.

Chi-Square Tests

	Value	df	p Value	.05 level
Pearson Chi-Square	129.424	4	.000	9.488

INTERPRETATION: This null hypothesis stands rejected at .05 level as the obtained chi square value 129.424 is greater than the table value ($P.05 = 9.488$). The inference drawn is that there is significant difference in level of attitude between youth of India and Bangladesh regarding the statement - Transgender people live sexually free life with respect to behavioural component.

DISCUSSION

A significant number of respondents (70.50%) from India expressed that they did not support the statement that transgender people should have equal rights in society as anyone else, showing their disrespect for them. It reflects their negative attitude towards transgender people. But in Bangladesh, 35% agreed it and 35% disagreed the statement. The claim that transgender people are always mentally ill. They were rejected or strongly rejected by the majority of respondents from Bangladesh (64%) and India (63.50%). It highlights regarding the awareness of psychological well-being of transgender people. Transgender people are homosexual, according to a sizable portion of respondents from Bangladesh (46%) and India (59.50%). It highlights a widespread confusion or misunderstanding regarding sexual orientation.

The statement that there is nothing wrong with being transgender was either strongly agreed with or agreed with by the majority of respondents from Bangladesh and India, indicating a progressive understanding. This suggests a positive indicator of acceptance for transgender people. From both India (68.50%) and Bangladesh (58%) a large number of respondents endorsed the belief that transgender people belong to a lower socio-economic group which indicates a deep-rooted socio-economic stereotype concept prevalent among young people. The belief that transgender persons are violent and aggressive was endorsed by a higher number of both Indian and Bangladeshi respondents. This kind of perception contributes to stigmatization and indicates a cognitive barrier to inclusion.

Majority of Indian young people either disagreed that transgender people's gender presentation is disgusting while a larger percentage (68%) of Bangladeshi respondents agreed

with the statement which reflects deep-seated discomfort with non-conforming gender expressions among Bangladeshi young people. When asked about their desire to learn about transgender people a vast majority of the Indian (68.50%) and Bangladeshi respondents (38.50%) agreed to gain more knowledge about transgender people. It shows an initiative to promote knowledge on this topic. It also expresses their positive curiosity and willingness to learn about transgender people to understand them better.

Most of the respondents from India and Bangladesh either strongly agreed or agreed that transgender people cannot be friends. It highlights that they are not at all open to the idea of friendship. A larger number of young people from India and Bangladesh agreed or strongly agreed that they would like to invite transgender people as guests in family. It shows a positive willingness of acceptance. They are open to inviting transgender people as guests into their families. A significant number of young respondents from India and Bangladesh showed their negative attitudes towards accepting transgender people as life partners. It shows that they are not open to personal relationships with transgender people. Majority of the respondents from both the country showed their dislike to accept transgender people as business partner. It highlights that they are not open to professional relationships with transgender people.

A large number of respondents from both the country did not agree to accept transgender people as employee, showing significant resistance. Most of the respondents from India and Bangladesh showed their strong positive feelings that they do not feel embarrassed to be close to a transgender person. It shows their acceptance for the presence of transgender person. It also suggests that many young people in India and Bangladesh may experience comfort when interacting with transgender people. A significant percentage of young people from both the country either agreed or strongly agreed that transgender people have psychological illness and they need psychiatric treatment. It indicates that in India and Bangladesh most of the young people may view transgender identity as mental health issue rather than a natural aspect of human diversity. The statement that transgender people choose alternative lifestyle like anyone else was either agreed or strongly agreed by a large percentage of respondents from India and Bangladesh. They may view that alternative lifestyle is a personal choice rather than deviant behaviour. It could indicate a softer and more modern perception when framed as individual freedom.

A notable percentage of Indian respondents did not show any avoidance behavior while most of the Bangladeshi respondents displayed a tendency to maintain physical distance from transgender people. It indicates stronger physical exclusion in Bangladeshi young peoples' attitude and also reflects deeper social discomfort or stigma. Most of the Indian and Bangladeshi respondents do not believe in treating transgender people with basic respect. They think that teasing transgender people is acceptable. It suggests incomplete acceptance of transgender individuals. A large percentage of Indian respondents are open to democratic inclusion of transgender people. The huge support for political representation might reflect respect for political rights. But most of the Bangladeshi respondents would not like to accept any transgender person as a political representative. It shows cultural hesitation about

transgender in public life. While a sizable portion of Bangladeshi respondents either strongly agreed or agreed that transgender people are a curse that should be ignored, the majority of Indian respondents disagreed. They viewed that transgender people are socially unacceptable.

A significant percentage of Indian and Bangladeshi respondents thought families abandon transgender individuals. They saw family neglect transgender as normal or expected. It shows cultural pressure on families to uphold honor by disowning transgender offspring. The belief that most of the transgender people are associated with commercial sex work was endorsed by a higher percentage of Indian and Bangladeshi respondents. Such belief shows deep ignorance and social isolation. Most of the Indian and Bangladeshi respondents thought that transgender people are sexually liberated. They viewed transgender people as rejecting traditional family and social norms.

CONCLUSION

In both countries, most of the youth think that transgender people are homosexuals and an aggressive and economically backward community. The youth of both countries believe that transgender community is a caste that has broken away from their families and that they are mostly associated with sex workers. To remove these negative perceptions among the youth, a complete understanding of transgender issues needs to be presented among the youth, which will help them develop a healthy and humane perception. However, despite the lack of knowledge about transgender among the youth, they have realized that a person can be transgender and that he or she has a healthy, normal mental state like other people and lives sexually free life.

Although the youth of both countries have stated that they do not feel any shame or discomfort or fear when they see transgender people, most Bangladeshi youth have a tendency to leave their place when they see transgender people, perhaps they feel hesitant to be around transgender people in front of society. However, it can be said that most of the youth of India and Bangladesh have expressed their interest in gaining more knowledge about transgender community so that they can know what the real issue is about transgender people. This thirst for knowledge may be a ray of hope that will be able to turn the negative ideas of all youth into positive ones. However, in order to promote a more accepting society for transgender people, there is a need for increased awareness and education regarding transgender issues.

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ACHIEVEMENT MOTIVATION IN RELATION TO ACHIEVEMENT IN LIFE SCIENCE AT SECONDARY LEVEL

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ABSTRACT

The present study tries to find out Achievement Motivation and its relationship with Achievement in Life Science among secondary school students in West Bengal. A descriptive survey method within a quantitative framework was adopted by the researchers to examine differences across gender of students and location of schools. Relationship between the two variables also studied. The sample comprised 208 students selected through stratified random sampling method from 28 Govt. and Govt. aided Bengali medium schools affiliated to the West Bengal Board of Secondary Education (WBBSE). Data were collected using the Deo-Mohan Achievement Motivation Scale (AMSn-DM) and a standardized Achievement Test in Life Science (ATLS) developed by the researchers. Independent samples *t*-tests and Pearson's correlation were performed in this study. The findings revealed no significant differences in Achievement Motivation across gender of students or location of schools. Similarly, Achievement in Life Science did not differ significantly between urban and rural students. However, a significant difference was observed in Achievement in Life Science between boy and girl secondary students. Further, a statistically significant positive but weak correlation was found between Achievement Motivation and Achievement in Life Science. The study concludes that while Achievement Motivation is an important factor associated with academic performance, it alone does not strongly predict Achievement in Life Science. The findings highlight the need for a comprehensive educational approach integrating motivational, cognitive, and instructional factors to enhance students' academic outcomes.

Keywords: Achievement motivation, Achievement in Life Science, Secondary school students, Gender differences, Rural and urban schools.

INTRODUCTION

Achievement Motivation represents an individual's internal drive to attain specific goals, a characteristic that exhibits significant personal variation. Rabideau (2005) characterizes this as an aspiration for excellence or success, fulfilled through various strategies driven by a combination of intrinsic and extrinsic elements. Research by Bidyadhar (2006) suggests that the manifestation of achievement-oriented behaviors in highly motivated individuals is shaped by diverse factors, including environmental conditions, family backgrounds, child-rearing practices, and socio-economic status. Therefore, studying the

impact of Achievement Motivation on the academic performance of students from varied backgrounds remains an important area of educational study.

In the field of education, achievement is an omnipresent concept. It is represented in various quantitative measures such as marks, grades, scores, or awards that students earn through their participation in both curricular and co-curricular academic activities. According to Wigfield and Cambria (2010), the purposes and motives that drive students to participate in these achievement-focused tasks form the motivation-related concepts among them which are influenced by students' interests, task values, and goal orientations. Furthermore, achievement scores serve as a vital metric for quantifying learning outcomes, as they directly reflect a student's level of mastery within a specific academic subject.

In modern education, secondary-level Life Science performance is very important for researchers and policymakers. Despite better resources, there exist academic discrepancies as students often show different level of mastery even with identical instruction. So, to succeed in the subject, understanding complex theories and technical terms through proactive engagement are very much required. However, variations in learners' effort and motivational level often leads to unequal achievement. Demographic diversity further complicates performance, with gaps frequently noted across gender of students and location of schools although standardized curricula being followed across these categorical variables. So, there is a need to investigate how specific learner traits and backgrounds influence success in Life Science.

The present study investigated the level of Achievement Motivation and its relationship with Achievement in Life Science among secondary school students of Govt. and Govt.-aided schools affiliated with the West Bengal Board of Secondary Education (WBBSE). By examining these variables across location of schools and gender of students, the research offers evidence-based insights that may foster academic excellence and enhance learning outcomes in secondary education in West Bengal.

OBJECTIVES OF THE STUDY

O₁: To study the Achievement Motivation level of secondary school students across the location of schools and gender of the students.

O₂: To study the Achievement in Life Science of secondary school students across the location of schools and gender of the students.

O₃: To compare Achievement Motivation level of secondary school students across the location of schools and gender of the students.

O₄: To compare Achievement in Life Science of secondary school students across the location of schools and gender of the students.

O₅: To find out the relationship between the level of Achievement Motivation and Achievement in Life Science of secondary school students.

HYPOTHESES

H₀1: There is no significant difference between the urban and rural students studying at secondary level in their level of Achievement Motivation.

H₀2: There is no significant difference between the boy and girl students studying at secondary level in their level of Achievement Motivation.

H₀3: There is no significant difference in the level of Achievement in Life Science between the urban and rural students at secondary level.

H₀4: There is no significant difference in the level of Achievement in Life Science between the boy and girl students studying at secondary level.

H₀5: There is no significant correlation between Achievement Motivation and Achievement in Life Science of students studying at secondary level.

METHODOLOGY

The study is a quantitative research that follows a descriptive survey method. This method was selected as it is particularly effective for collecting quantitative data to analyze current conditions and identify correlations between the variables of the study. The researchers utilized the IBM SPSS (Statistical Package for the Social Sciences, Version 29.0) software to perform all the descriptive and inferential statistical calculations related to this study.

Variables

Two major variables are considered for the study -

- a) Achievement Motivation and
- b) Achievement in Life Science

In order to examine the impact of these primary variables, two categorical variables were identified:

- a) Location of schools (Rural and Urban)
- b) Gender of students (Girl and Boy).

Population

The research focused on secondary school students enrolled in West Bengal's Govt. and Govt.-aided schools. The study was limited to Bengali medium schools that are affiliated with the West Bengal Board of Secondary Education (WBBSE).

Sampling Procedure and Sample Size

To maintain a representative sample across various socio-economic and geographical regions, ten districts in West Bengal were selected at random for the study. From these districts, a stratified random sampling method was applied to select twenty-eight secondary schools that use Bengali as their medium of instruction and are affiliated with the West Bengal Board of Secondary Education (WBBSE).

Table 1: *Sample Size of the Study*

Categories	Urban	Rural	Total
Boy	44	46	90
Girl	70	48	118
Total	114	94	208

Tools of the Study

Deo-Mohan Achievement Motivation Scale [AMSn-DM] (2011 revised)

The Deo-Mohan Achievement Motivation Scale [AMSn-DM] (2011 revision), developed by Prof. Prathibha Deo and Dr. Asha Mohan, was administered to evaluate the Achievement Motivation of students. This scale consists of 50 multiple-choice items out of which 37 were positive items and 13 were negative items. The Scale exhibited a high level of **reliability**, with **Cronbach's Alpha 0.801** across all 50 items. Participants provided responses based on a five-point scale - "Always", "Frequently", "Sometimes", "Rarely" and "Never". Positive items were scored from 4, 3, 2, 1, and 0 to the categories "Always," "Frequently," "Sometimes," "Rarely," and "Never," respectively. Whereas, negative items were scored in reverse order: "Always" received 0, "Frequently" 1, "Sometimes" 2, "Rarely" 3, and "Never" 4.

To facilitate the use of the Scale in Bengali medium schools, the original English version was translated into Bengali. Three experts validated the Bengali version, and their recommendations were used to perfect the scale. To ensure equivalence between the two language forms, both versions of the scale were administered on 60 students selected from 3 schools of Howrah and Hooghly districts over an interval of 30 days. The analysis shown a significantly strong 2-tailed correlation ($r = 0.622$, $p < .001$) at the 0.01 level for the AMSn-DM (2011 revised) English and Bengali versions. That reflects equivalence of the Bengali translation of the scale with the original English version.

Achievement Test in Life Science (ATLS)

The Achievement Test in Life Science (ATLS), designed for students at the secondary level, consisted of **31 items** with a total of **35 marks**. Developed in accordance with the revised Bloom's Taxonomy, the test featured objective-type questions such as Multiple Choice Questions (MCQ), True/False (TF), Fill in the Blanks (FIB) etc. The ninth-standard Life Science curriculum of the WBBSE board served as the basis for the test material. The test was standardized based on a representative sample of 649 secondary level students from West Bengal, yielding a **reliability** coefficient of **0.862**, while the interpretation of scores was facilitated through a three-tier normative framework.

Delimitation of the Study

Stratified random sampling method was followed for the selection of schools for this study. The sample of this study was selected only from the Govt. / Govt. aided Bengali

medium schools affiliated to the WBBSE. Private schools, English Medium Schools and schools affiliated to other Boards like CBSE, ICSE etc. have been kept out of this present study.

Data Collection Procedure

The researchers used printed booklets containing both assessment tools to gather data for this research.

DESCRIPTIVE STATISTICS

Table 2: Descriptive Statistics for the level of Achievement Motivation and Achievement in Life Science of secondary students measured by AMSn-DM and ATLS respectively

Variable	Achievement Motivation		Achievement in Life Science	
Categories	Statistic	Std. Error	Statistic	Std. Error
Mean	142.04	1.258	21.77	.499
Median	144.00		23.00	
Variance	329.104		51.896	
Standard Deviation	18.141		7.204	
Skewness	-.345	.169	-.436	.169
Kurtosis	-.688	.336	-.540	.336

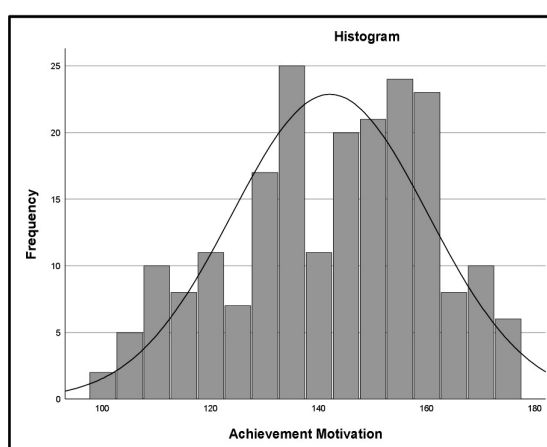


Figure 1: Histogram for Achievement Motivation score

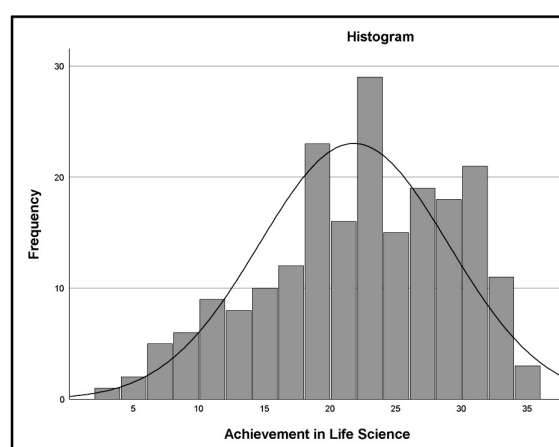


Figure 2: Histogram for Achievement in Life Science score

ANALYSIS AND INTERPRETATION

Objective-wise Analysis of Data

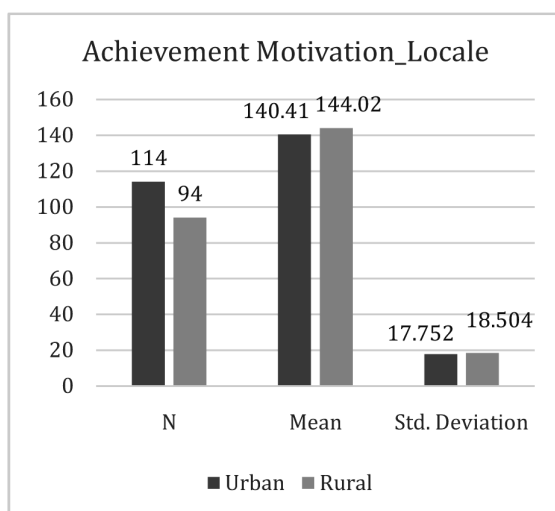
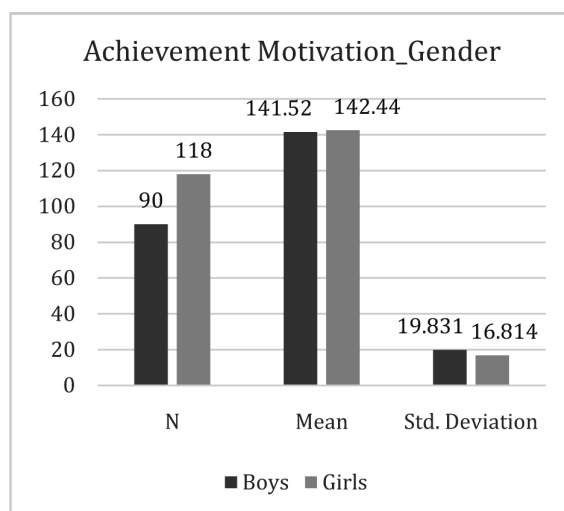
O₁: To study the Achievement Motivation level of secondary school students across the location of schools and gender of the students.

Table 3: Group Statistics of Achievement Motivation - Location-wise for Urban and Rural

Locale	N	Mean	Std. Error of Mean	Std. Deviation
Urban	114	140.41	1.663	17.752
Rural	94	144.02	1.909	18.504
Overall	208	142.04	1.258	18.141

Table 4: Group Statistics of Achievement Motivation - Gender-wise for Boys and Girls

Gender	N	Mean	Std. Error of Mean	Std. Deviation
Boys	90	141.52	2.090	19.831
Girls	118	142.44	1.548	16.814
Total	208	142.04	1.258	18.141

**Figure 3:** Group statistics of Achievement Motivation_ Location of schools**Figure 4:** Group Statistics of Achievement Motivation_ Gender of students

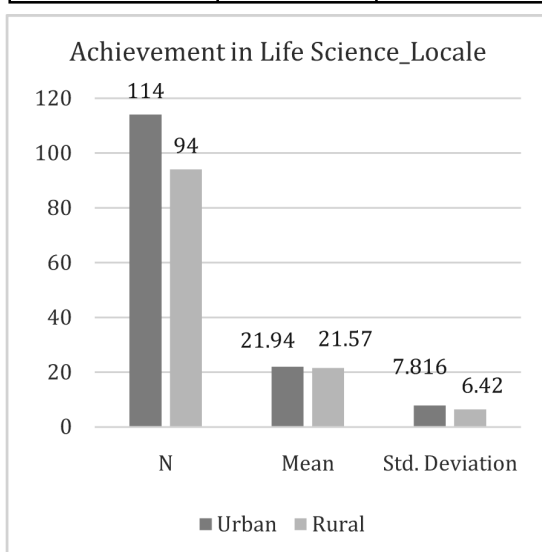
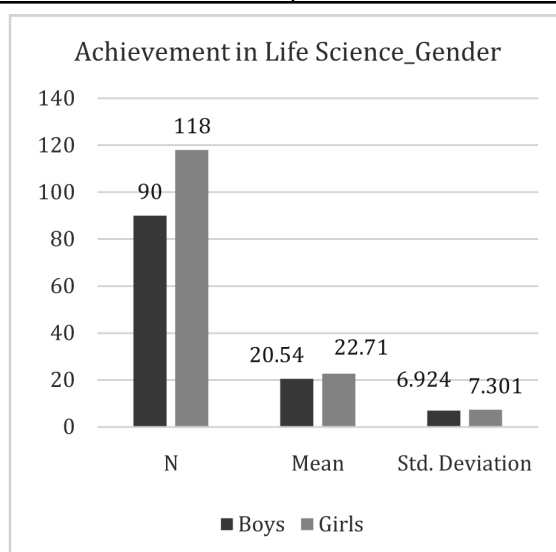
O₂: To study the Achievement in Life Science level of secondary school students across the location of schools and gender of the students.

Table 5: Group Statistics of Achievement in Life Science: Locale-wise for Urban and Rural

Locale	N	Mean	Std. Error of Mean	Std. Deviation
Urban	114	21.94	0.732	7.816
Rural	94	21.57	0.662	6.420
Total	208	21.77	0.499	7.204

Table 6: Descriptive Statistics of Achievement in Life Science: Gender-wise for Boys and Girls

Gender	N	Mean	Std. Error of Mean	Std. Deviation
Boys	90	20.54	0.730	6.924
Girls	118	22.71	0.672	7.301
Total	208	21.77	0.499	7.204

**Figure 5:** Group statistics of Achievement in Life Science_ Location of schools**Figure 6:** Group Statistics of Achievement in Life Science_ Gender of students

O₃: To compare Achievement Motivation level of secondary school students across the location of schools and gender of the students.

H₀1: There is no significant difference between the urban and rural students studying at secondary level in their level of Achievement Motivation.

Table 7: Locale-wise Independent Samples t-test for Achievement Motivation

Levene's Test for Equality of Variances			t-test for Equality of Means			
Variable	F	Sig.	t	df	Sig. (2-Sided)	Mean Diff.
Achievement Motivation (Equal variances assumed)	.130	.719	-1.432#	206	.154	-3.609
# Not significant at the 0.05 level						

Interpretation

The independent sample t-test results presented in **Table 7** shows a calculated F value of 0.130 for Levene's Test of equality of variances, with an associated p-value of 0.719. This

finding demonstrates that the variance in scores for urban and rural secondary school students does not differ significantly; consequently, the assumption of equal variance is not rejected. The resulting $t_{(206)}$ value is 1.432, yielding a **p-value** of 0.154, which indicates the difference is not statistically significant at the $\alpha = 0.05$ level. Accordingly, the null hypothesis **H₀1 is not rejected**. It can therefore be concluded that no significant difference exists between the urban and rural secondary school students regarding their Achievement Motivation.

H₀2: There is no significant difference between the boy and girl students studying at secondary level in their level of Achievement Motivation.

Table 8: Gender-wise Independent Samples t-tests for Achievement Motivation

Levene's Test for Equality of Variances			t-test for Equality of Means			
Variable	F	Sig.	t	df	Sig. (2-Sided)	Mean Diff.
Achievement Motivation (Equal variances not assumed)	6.731	.010	-.353#	173.644	.724	-.918
# Not significant at the 0.05 level						

Interpretation

The independent sample t-test results presented in **Table 8** shows a calculated F value of 6.731 for Levene's Test of equality of variances, with an associated p-value of 0.01. This finding demonstrates that the variance in scores for boy and girl secondary school students differs significantly; consequently, the assumption of equal variance is rejected. Due to this violation, the **df** was adjusted to 173.644. The resulting $t_{(173.644)}$ value is 0.353, yielding a **p-value** of 0.724, which indicates the difference is not statistically significant at the $\alpha = 0.05$ level. Accordingly, the null hypothesis **H₀2 is not rejected**. It can therefore be concluded that no significant difference exists between boy and girl secondary school students regarding their Achievement Motivation.

O₄: To compare Achievement in Life Science of secondary school students across the location of schools and gender of the students.

H₀3: There is no significant difference in the level of Achievement in Life Science between the urban and rural students at secondary level.

Table 9: Locale-wise Independent Samples t-Test for Achievement in Life Science

Levene's Test for Equality of Variances			t-test for Equality of Means			
Variable	F	Sig.	t	df	Sig. (2-Sided)	Mean Diff.
Achievement in Life Science (Equal variances not assumed)	5.794	.017	.369#	205.998	.713	.364
# Not significant at the 0.05 level						

Interpretation

The independent sample t-test results presented in **Table 9** show a calculated F value of 5.794 for Levene's Test of equality of variances, with an associated p-value of 0.017. This finding demonstrates that the variance in scores for urban and rural secondary school students differs significantly; consequently, the assumption of equal variance is rejected. Due to this violation, the **df** was adjusted to 205.998. The resulting $t_{(205.998)}$ value is 0.369, yielding a **p-value** of 0.713, which indicates the difference is not statistically significant at the $\alpha = 0.05$ level. Accordingly, the null hypothesis **H₀3 is not rejected**. It can therefore be concluded that no significant difference exists between urban and rural secondary school students regarding their Achievement in Life Science subject.

H₀4: There is no significant difference in the level of Achievement in Life Science between the boy and girl students studying at secondary level.

Table 10: Gender-wise Independent Samples t-Test for Achievement in Life Science

Levene's Test for Equality of Variances			t-test for Equality of Means			
Variable	F	Sig.	t	df	Sig. (2-Sided)	Mean Diff.
Achievement in Life Science (Equal variances not assumed)	.733	.393	-2.185*	196.475	.030	-2.167
*Significant at the 0.05 level						

Interpretation

The independent sample t-test results presented in **Table 10** show a calculated F value of 0.733 for Levene's Test of equality of variances, with an associated p-value of 0.393. This finding demonstrates that the variance in scores for boy and girl secondary school students differs significantly; consequently, the assumption of equal variance is rejected. Due to this violation, the **df** was adjusted to 196.475. The resulting $t_{(196.475)}$ value is 2.185, yielding a **p-value** of 0.030, which indicates the difference is statistically significant at the $\alpha = 0.05$ level. Accordingly, the null hypothesis **H₀4 is rejected**. It can therefore be concluded that there exists significant difference between the boy and girl secondary school students in their Achievement in Life Science subject.

O₅: To find out the relationship between the level of Achievement Motivation and Achievement in Life Science of secondary school students.

H₀5: There is no significant correlation between Achievement Motivation and Achievement in Life Science of students studying at secondary level.

Table 11: *Correlations between Achievement Motivation and Achievement in Life Science*

		Achievement Motivation	Achievement in Life Science
Achievement Motivation	Pearson Correlation	1	.247**
	Sig. (2-tailed)		<.001
	N	208	208
Achievement in Life Science	Pearson Correlation	.247**	1
	Sig. (2-tailed)	<.001	
	N	208	208
** Correlation is significant at the 0.01 level (2-tailed).			

Interpretation

Table 11 depicts that the Pearson Correlation coefficient (r), calculated for Achievement Motivation and Achievement in Life Science, was 0.247. This is significant at the 0.05 level (2-tailed) as the $p < 0.001$. Hence the H_0 **is rejected**. So, it can be said that there is a significant relationship between Achievement Motivation and Achievement in Life Science of students at secondary level. But the correlation between Achievement Motivation and Achievement in Life Science is positive in direction and weak in magnitude.

FINDINGS, DISCUSSION AND CONCLUSION

The present study examined Achievement Motivation and its relationship with Achievement in Life Science among secondary school students across gender and locale demographic variables.

With regard to Achievement Motivation, the descriptive statistics indicated that rural students had slightly higher mean scores than urban students. However, the independent samples t -test shown that this difference was not statistically significant. Similarly, no significant difference was observed between boys and girls. In terms of Achievement in Life Science, urban students marginally better performed than rural students, although the difference was not statistically significant. However, a statistically significant difference was found in respect to the gender of students in the level of Achievement in Life Science where the mean score of girls were higher than the boys. Furthermore, the Pearson product-moment correlation analysis revealed a statistically significant positive but weak relationship between Achievement Motivation and Achievement in Life Science.

The absence of significant differences in Achievement Motivation across locale suggests that students from urban and rural backgrounds have comparable motivational level. This finding aligns with the view that motivational levels are increasingly shaped by broader educational frameworks, standardized curricula, and shared sociocultural influences rather than geographical location alone (Eccles & Wigfield, 2002).

Similarly, the lack of significant difference among boy and girl students in

Achievement Motivation indicates that both boy and girl students demonstrate comparable levels of Achievement Motivation. This result is consistent with some researches that suggest weakening gender gaps in Achievement Motivational level due to increased emphasis on gender equity in education (Meece et al., 2006).

On the contrary, a significant difference was observed in Achievement in Life Science between boy and girl secondary students where the mean score of girls were higher than boys. Sunita (2020), in a descriptive survey conducted in Haryana, reported that Achievement Motivation, intelligence, and self-efficacy are positively correlated with academic achievement at the senior secondary level. The study further revealed that female students demonstrated significantly higher academic performances compared to their male students. The present finding is aligned with this pattern. This finding supports previous research indicating that girls often demonstrate higher academic achievement in science-related subjects at the school level, possibly due to greater academic engagement, better study habits, and higher levels of persistence (Duckworth & Seligman, 2006).

The non-significant difference in Achievement in Life Science across location of schools suggests that academic performance may not be strongly determined by geographical context alone. This may indicate that factors such as teaching quality, curriculum design, and assessment practices play a more crucial role in influencing academic results than location-based differences.

A key finding of the study is the statistically significant but weak positive correlation between Achievement Motivation and Achievement in Life Science. This suggests that while motivated students tend to perform better academically, motivation alone does not account for substantial variance in achievement. This finding is consistent with the multifactorial perspective of academic achievement, which emphasizes the combined influence of cognitive abilities, metacognitive skills, learning environments, and socio-emotional factors (Pintrich & De Groot, 1990).

Thus, the results highlight that Achievement Motivation is an important determinant of academic success. The relatively low correlation coefficient highlights the need to consider additional variables such as attitude towards the subject, teaching-learning processes, and self-regulated learning strategies. These findings suggest that while fostering Achievement Motivation is essential, it should be complemented by efforts to enhance other academic and psychological factors that influence learning outcomes. So, a holistic approach that integrates motivational, cognitive, and environmental dimensions is necessary for improving students' achievement in Life Science.

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YOGA EDUCATION RESEARCH IN THE ERA OF HOLISTIC LEARNING: A BIBLIOMETRIC ANALYSIS OF TRENDS, THEMES, AND COLLABORATION

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ABSTRACT

This study performed an in-depth bibliometric study of the yoga education research published from 2015 to 2025, analyzed the intellectual framework of this study, current and future trending analysis along with study analysis done via collaboration. Collected data from Scopus database resulted in 523 results while applying PRISMA-directed selection criteria. Performance analysis and science mapping tools like Biblioshiny and VOSviewer have been used in this study. There is a strong output growth of Yoga Education research output with an average of yearly increase of 30.98% suggesting increased global awareness towards yoga as an educational and wellness tool. The United States & India have emerged as the biggest contributors to Yoga Education research output followed by Germany, Canada and Malaysia respectively. A moderately connected global yoga Education research network with a large number of contributing authors in a variety of institutions throughout several countries is identified by keyword Co-occurrence analysis. Current trending analysis shows Keywords such as Mental health, Mindfulness, Stress, physical activity suggesting its interdisciplinary context and its recent trend of a very action and context specific trend of yoga education studies after the pandemic. The study can provide great insight into the yoga Education research history and a glance at its future direction.

Keywords : Yoga Education; Bibliometric Analysis; Research Trends; Science Mapping; Mental Health; Collaboration.

BACKGROUND

In recent decades education has moved away from cognitive achievement towards learner development that includes well-being on all levels - physical, emotional, social and psychological (Sarkar, 2025; OECD, 2019). Mind-body practices - especially yoga - are becoming more accepted as supporting balanced growth in terms of educational and health outcomes (Hawks et al., 2021; Khalsa & Butzer 2016). From ancient Indian traditions yoga involves physical postures, breath control and meditation (Dubey & Tiwari, 2023). Originally spiritual in nature, yoga has been adapted for scientific and educational purposes with

improvements in attention regulation, stress management and psychological well-being of students (Hagen & Nayar, 2014; Felver et al., 2016). It's especially relevant with rising youth anxiety and behavioural difficulties (WHO 2021).

Yoga is being taught in schools and mental health programmes in line with social-emotional learning principles of self-awareness, regulation, and interpersonal skills (Jones et al., 2017; Sakshi & Thapliyal, 2022). Yoga's adaptability also makes yoga conducive to inclusive learning environments for diverse and special needs learners through increased awareness of self and others and emotional resilience (Accardo, 2017; Rashedi & Schonert-Reichl, 2019). But research is uneven across disciplines and there is much less pedagogical integration like curriculum development and teacher training (Gupta & Dhawan, 2022; Lanohan & Galigao, 2025). In turn, educational value of yoga is often narrowly framed in biomedical outcomes (Bhavanani, 2011).

Systematic approaches like bibliometric analysis fill these gaps by assessing publication trends, collaboration networks, and thematic shifts of scholarly output. In the last decade interest in yoga education has grown due to the increasing attention paid worldwide to mental health, to whole school policies and to the COVID-19 pandemic on student well-being. In spite of increasing research volume and scope there are few systematic bibliometric studies which map the development of the field, major contributors and emerging trends and which thus limit our knowledge of worldwide research distribution and thematic evolution.

In doing so, this work does bibliometric analysis of yoga education research from 2015 to 2025 with Scopus data combining performance analysis and science mapping to describe the field on its structural, intellectual and conceptual levels. Results are meant to build on the existing evidence base and to promote systematic yoga inclusion in education systems today.

OBJECTIVES OF THE STUDY

In this work we set out to achieve the following:

1. To investigate trends in the number of publications of research involving yoga education from 2015 to 2025.
2. Determining high influential authors, journals, institutions and countries associated with the yoga education research.
3. Analyse authorship networks and their associated collaborative networks (both national and international collaborative networks).
4. Measure the citation impact and intellectual impact of publications using bibliometric indices of impact, such as citation, h-index and co-citation.
5. Identifying keyword co-occurrence and dominant research themes in mapping the conceptual structure of the field.
6. To identify emerging research patterns and thematic changes in yoga education.
7. Distribution of research productivity following existing bibliometric laws as Lotka's law and Bradford's law.

RESEARCH QUESTIONS

Questions for the present study are as follows:

1. What are the patterns of publication and growth of yoga education research from 2015 to 2025?
2. Who are the most productive and cited authors, journals, institutions and countries in the field of analysis?
3. Is authorship patterned and to what extent does collaboration and international co-authorship exist?
4. What publications have the highest impact, and what does it say about intellectual structure in the field?
5. What research themes and conceptual clusters are reflected in the keyword analysis of yoga education?
6. What has been the evolution of research themes over time and what are emerging themes within the last few years?
7. To what extent do the patterns of authorship and of journal distribution fit Lotka's Law and Bradford's Law?

RESEARCH METHODOLOGY

Research Design

In this study I employ quantitative bibliometric and science mapping research designs to study yoga education research intellectual structure and current trends. By bibliometric analysis we have a way of looking at statistical and citation indicators of scholarly publications which are used to measure research productivity and citation impact and collaboration in the field (Donthu et al., 2021; Zupic & Cater, 2015). Science mapping also maps connections between authors, institutions, journals, and themes of research. All of these methods take a picture of how the field developed, organized itself, and how knowledge is shared.

Date Source

Bibliography for this study was drawn from Scopus - one of the biggest and best collections of peer-reviewed literature. We selected Scopus because it includes high quality academic journals with reliable citation indexing and because it is suitable for bibliometric research. Also, Scopus provides standardized metadata in a structured way that is usable for analysis with VOSviewer and Biblioshiny. The dataset was systematically gathered on 19th March 2026 to include the latest and most relevant publications within the study scope.

Search Strategy

Publications concerning Yoga Education Research were found through structured search strategy. The search query used Boolean operators and used typical keywords in the field. The search string used in Scopus was:

TITLE-ABS-KEY ((yoga OR yogic OR “yoga-based” OR “yoga intervention*” OR “yoga practice*” OR “school yoga” OR “classroom yoga”) AND (education OR school* OR student* OR pupil* OR child* OR adolescent* OR youth OR teen* OR classroom* OR teacher* OR educator* OR pedagogy OR pedagog* OR curriculum* OR instruction* OR teaching OR learning OR “physical education” OR preschool* OR kindergarten OR “early childhood education” OR “primary education” OR “elementary education” OR “secondary education” OR “high school*” OR college* OR universit*)) OR TITLE-ABS-KEY (“yoga education” OR “yoga in education” OR “yoga for education” OR “school yoga” OR “classroom yoga” OR “yoga pedagogy” OR “yogic pedagogy” OR “yoga curriculum” OR “yoga-based curriculum” OR “teaching yoga” OR “teaching yoga in schools” OR “yoga instruction” OR “yoga in schools” OR “yoga in the classroom” OR “yoga for students” OR “yoga for children” OR “yoga for adolescents” OR “yoga teacher education”) AND PUBYEAR > 2014 AND PUBYEAR < 2026 AND (LIMIT-TO (LANGUAGE , “English”)) AND (LIMIT-TO (DOCTYPE , “ar”)) AND (LIMIT-TO (PUBSTAGE , “final”)) AND (LIMIT-TO (SUBJAREA , “SOCI”) OR LIMIT-TO (SUBJAREA , “HEAL”) OR LIMIT-TO (SUBJAREA , “PSYC”)) AND (LIMIT-TO (OA , “all”))

The search was restricted to titles, abstracts, and keywords to ensure the relevance of retrieved records.

Inclusion, Exclusion, and Prisma-Guided Protocol

The data selection in this study was carried out systematically and transparently, according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guideline to identify, screen, and finalize the publications included for the bibliometric analysis.

Stage	Description	Records (n)
Identification	Records identified from Scopus (core collection)	7004
	Duplicate records removed	0
Screening Eligibility Filters	Records screened (2015–2025)	5189
	Records included based on language (English)	5028
	Document type: Articles	3217
	Final publication stage	3171
	Subject area: Social Sciences	486
	Subject area: Health Professionals	395
	Subject area: Psychology	389
	Open access publications	523
Included	Studies included for bibliometric analysis	523

The search in Scopus yielded 7004 results. Upon exclusion of publications from outside 2015 to 2025 (as the time frame of interest was 2015-2025, publication in English language, journal article publication in final publication state, relevant subject areas (Social Sciences, Health Professionals, Psychology), and open access publications, the datasets were restricted step by step to 523 articles. This PRISMA guided-filtering resulted in a consistent and transparent selection.

Data Collection Process

Collecting data involved keyword finding to create search string, bibliographic record retrieval from Scopus in CSV format and cleaning up duplicates and incomplete records. Titles/abstracts were then screened for relevance and the final dataset arranged for bibliometric analysis.

Bibliometric Tools Used

The bibliometric analysis of Autoethnography in Language Teaching used a set of tools to explore and visualize research patterns. VOSviewer was used to create and show bibliometric networks such as co-authorship or keyword co-occurrence in order to find relationships in the research network. Biblioshiny (the web interface of Bibliometrix package in R) and the R Bibliometrix package were used to carry out a descriptive bibliometric analysis providing the necessary variables to generate descriptive and visualization indices as Annual Scientific Production, Citation Index, or Thematic Maps, among others. Microsoft Excel was used during the early stages (preparing bibliometric data and performing basic descriptive indices) before loading it into R for more detailed analyses.

Bibliometric Techniques Applied

The present study applied both performance analysis and science mapping in analyzing the research landscape of yoga education. Performance analysis included estimation of research productivity and its impact using metrics such as the number of publications per year, total citations, h-index, g-index and m-index at the author-level. Science mapping was applied for estimation of collaborative behaviour using the co-authorship network of authors and countries and estimation of research themes and their clustering using co-occurrences of keywords. Classical bibliometric laws, Lotka's law and Bradford's law were used to study author productivity distribution and concentration of the influential journals respectively.

Keywords used for Analysis

The keyword analysis used both Author Keywords (DE) and Keywords Plus (ID) from Scopus, starting with 1,713 and 2,188 terms respectively. Applying a threshold of 10 occurrences narrowed this to 19 key keywords. "Yoga" emerged as the central term, strongly linked to concepts like "mindfulness," "mental health," "stress," "physical activity," and "meditation," highlighting a focus on psychological and health aspects. The co-occurrence map shows yoga as a hub connecting mental well-being, physical health, and education. Terms such as "adolescents," "children," "physical education," and "COVID-19" indicate growing interest in specific populations and current issues, reflecting the interdisciplinary and evolving nature of yoga education research.

Data Analysis Procedure

The final dataset of 523 articles exported from Scopus in CSV format. After some initial cleaning and standardisation (in MS Excel), to guarantee reliability, was analysed using Biblioshiny (Bibliometrix package in R) to provide publication trends, citation metrics and authorship metrics. VOSviewer was used to create and plot networks such as co-authorship and keyword co-occurrence networks with given thresholds, results cross checked using the tool.

RESULTS AND INTERPRETATION

The present research presents a bibliometric time series portrait of yoga education research during the period 2015-2025. Descriptive data together with analytical ones are reported here to present the growth trends in research output; co-occurrence patterns; authorship and collaboration characteristics; and its thematic diversity. This offers a picture of the research domain's maturity over the study period and its nature as inter-disciplinary.

Table 1: Main Information

Description	Results
<i>Main Information about data</i>	
Timespan	2015:2025
Sources (Journals, Books, etc)	281
Documents	523
Annual Growth Rate %	30.98
Document Average Age	4.07
Average citations per doc	11.78
References	60548
<i>Document Contents</i>	
Keywords Plus (ID)	2188
Author's Keywords (DE)	1713
<i>Authors</i>	
Authors	2166
Authors of single-authored docs	58
<i>Authors Collaboration</i>	
Single-authored docs	60
Co-Authors per Doc	4.64
International co-authorships %	21.03
<i>Document Types</i>	
article	523

A bibliometric overview (Table 1) analyzes 523 documents, with publication period between 2015 to 2025, and 281 different sources. These 523 documents form a moderately sized but steadily growing research area. Publications grow annually by 30.98% (moderate growth rate) and the average age of documents is 4.07 years (well established yet growing field). Each document receives, on average, 11.78 citations (relatively moderate academic impact). The total count of references included is 60,548 (well connected, and mature knowledge area). Documents include 1,713 author keywords and 2,188 Keywords Plus, indicating considerable thematic heterogeneity among the documents. There are a total of 2,166 authors contributing to these documents. The average number of co-authors is 4.64 per paper. 60 documents were single-authored, however collaboration in the field appears to be dominant. The international co-authorship rate is moderate, at 21.03%. It can be summarized that in this field there is consistently growing research, high rates of collaboration.

Table 2: Annual Scientific Production (2015-2025)

Year	Articles
2015	7
2016	14
2017	20
2018	21
2019	34
2020	47
2021	64
2022	61
2023	76
2024	75
2025	104

The research output of the field has consistently increased since 2015 and reached as far as 2025, which shows growing interest of scholarly community. Initially, in 2015-2017 there were 7-20 publications about the topic of interest, after that came increasing numbers from 2018-2020 47, up to 64 publications in 2021, with further expansion to 61 (2022), followed by 76 (2023) and 75 (2024) - the highest amount so far, with an ever growing and expanding research area in the recent period in particular.

Most influential authors, institutions, journals, and countries contributing to Yoga Education.
Authors

Table 3: Top 10 Most Productive Authors ranked by h-index

Author	h index	g index	m index	TC	NP	PY start
UEBELACKER LISA A.	7	9	0.7	150	9	2017
TREMONT GEOFFREY	5	5	0.5	96	5	2017
NEUMARK-SZTAINER DIANNE	4	5	0.4	142	5	2017
OKA TAKAKAZU	4	5	0.333	57	5	2015
PARK CRYSTAL L.	4	4	0.4	135	4	2017
ABRANTES ANA M.	3	3	0.3	88	3	2017
BAENA-MORALES SALVADOR	3	3	0.6	25	3	2022
BARTOS L. JAVIER	3	4	0.5	66	4	2021
CRAMER HOLGER	3	4	0.375	61	4	2019
DAVIS LAUREN	3	3	0.6	25	3	2022

Table 3 continues with the top authors in yoga education research as measured by h-index, g-index, total citations, number of publications (TC), number of publications (NP) and when they first started to publish. Lisa A. Uebelacker ranks first in the majority of the measures with 7 h-index, 9 g-index and 150 total citations and has produced high citation impact since 2017. Geoffrey Tremont and Dianne Neumark-Sztainer rank second and third with many citations in spite of a modest number of publications and Crystal L. Park has a high citation impact relative to publication volume. Takakazu Oka made substantial contribution over a long period of time (starting as early as 2015). Emerging authors Salvador Baena-Morales and Lauren Davis had higher m-index (0.6) values reflecting rapid citation growth over a comparatively brief publication time.

Lotka's law of scientific productivity

Table 4: Distribution of authorship productivity according to Lotka's law of scientific productivity.

Documents written	N. of Authors	Proportion of Authors	Theoretical
6	1	0	0.018
7	1	0	0.013
8	1	0	0.01
9	1	0	0.008
5	4	0.002	0.026
4	6	0.003	0.041
3	30	0.014	0.072
2	140	0.065	0.162
1	1982	0.915	0.649

Table 4 demonstrates Lotka's Law by reporting author productivity distributions for the data. A large majority of authors contributed only one document (1,982; 91.5%), representing a strong trend towards contributors with a low number of publications. This percentage drops to 6.5% (140) for contributors producing two documents and to only 1.4% (30 authors) for three. Very few authors contribute more than four documents: there are essentially no more than 3 or 4 publications except possibly isolated cases of six or more publications.

Most Relevant Affiliations / Institutions

Table 5: Top 10 most productive institutional affiliations based on the number of published articles (2015- 2025)

Affiliation	Articles
UNIVERSITY OF DELHI	15
HARVARD MEDICAL SCHOOL	14
UNIVERSITY OF MINNESOTA	11
LAKSHMIBAI NATIONAL INSTITUTE OF PHYSICAL EDUCATION	9
NATIONAL INSTITUTE OF MENTAL HEALTH AND NEUROSCIENCES (NIMHANS)	8
UNIVERSITY OF PÉCS	8
VANDERBILT UNIVERSITY MEDICAL CENTER	8
BUTLER HOSPITAL	7
ELTE EÖTVÖS LORÁND UNIVERSITY	7
HASANUDDIN UNIVERSITY	7

The yoga education research productivity can be seen in Table 5 by publication count. University of Delhi with 15 publications, Harvard Medical School with 14 publications, University of Minnesota with 11 publications and Lakshmibai National Institute of Physical Education (9) and NIMHANS (8) were the top productive institutions. Internationally, the University of Pecs & Vanderbilt University Medical Center (8); Butler Hospital, ELTE Eoetvoso Lorand University, Hasanuddin University (7) were the productive institutions.

Geographical Distribution

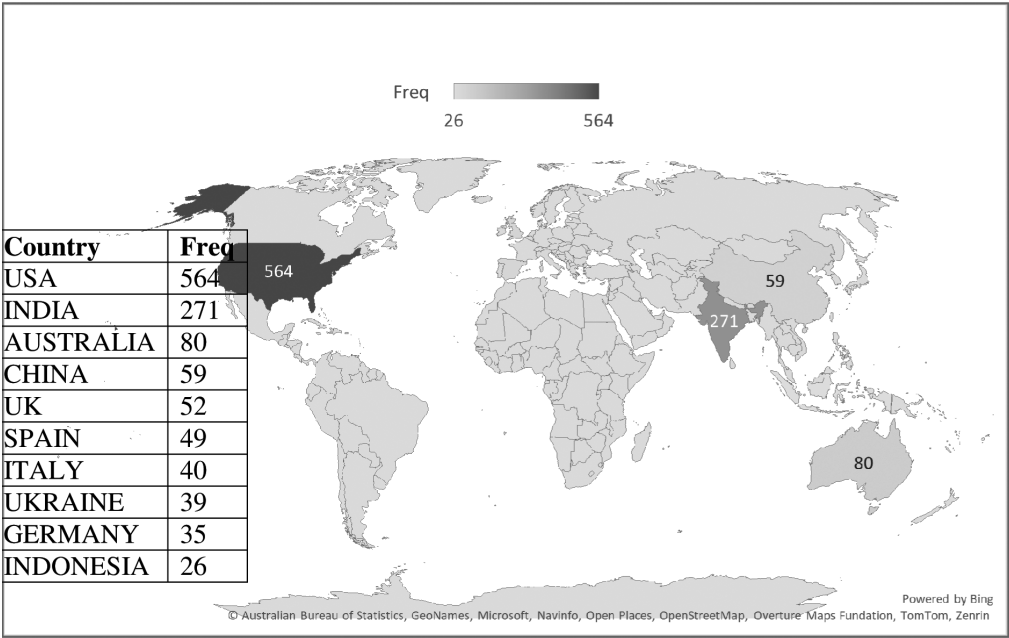


Figure 1: Global distribution of Top 10 countries’ scientific production

The contribution of each country in the global yoga education research is shown in Figure 1 with 564 published articles for the USA, 271 for India, 80 for Australia, and 59 for China. Further moderate research activity was produced by the United Kingdom (52); Spain (49); Italy (40); Ukraine (39); Germany (35) and Indonesia (26). The map in Figure 1 clearly shows country concentration on several powerful nations: the USA and India; and an expanding, and increasingly, international yoga research community.

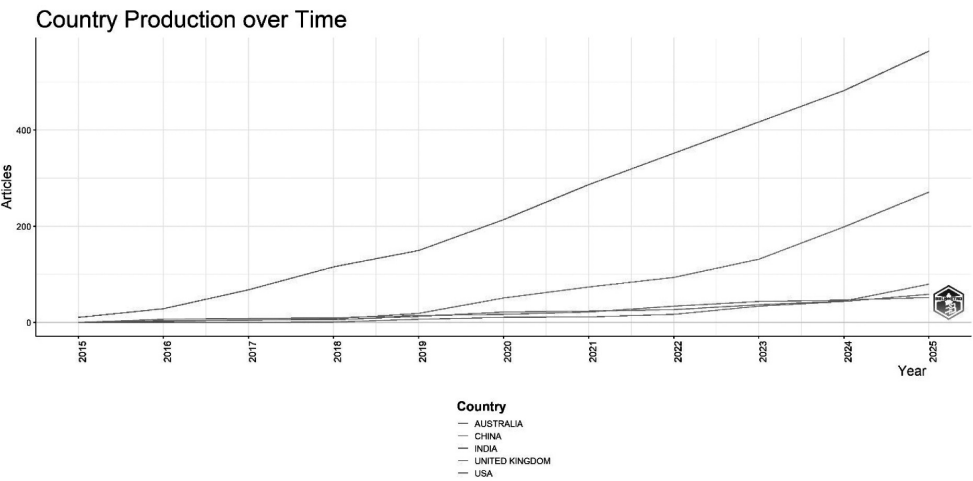


Figure 2: Country-wise scientific production over time (2015-2025)

Journals



Table 6: The top 10 core journals, ranked by h-index, are leading in research output within the Yoga Education Research

Source	h index	g index	m index	TC	NP	PY start
COMPLEMENTARY THERAPIES IN MEDICINE	13	20	1.182	482	30	2016
FRONTIERS IN PSYCHOLOGY	12	19	1.091	430	36	2016
FRONTIERS IN HUMAN NEUROSCIENCE	7	10	0.583	194	10	2015
HEALTHCARE (SWITZERLAND)	6	11	1.2	139	14	2022
JOURNAL OF EDUCATION AND HEALTH PROMOTION	6	8	0.857	80	16	2020
JOURNAL OF PHYSICAL EDUCATION AND SPORT	5	9	0.556	89	10	2018
MINDFULNESS	5	6	0.833	75	6	2021
BIOPSYCHOSOCIAL MEDICINE	4	5	0.333	57	5	2015
JOURNAL OF AUTISM AND DEVELOPMENTAL DISORDERS	4	5	0.571	78	5	2020
SUSTAINABILITY (SWITZERLAND)	4	4	0.444	90	4	2018

In Table 6, leading journals are listed by selected bibliometric metrics such as h-index, g-index, total citations, (NP) number of publications, and start year. Complementary Therapies in Medicine is the leading journal (h-index: 13, TC: 482). Frontiers in Psychology is second (h-index: 12, TC: 430), followed by the largest publication count (36), but with far less citations. Healthcare (Switzerland) exhibits the most rapid citations in the recent period. Other contributing journals include Frontiers in Human Neuroscience (h-index: 12, TC: 541) and the Journal of Education and Health Promotion (TC: 79).

Most Globally Cited Documents

Table 7: The top 10 globally cited papers ranked by total citations, total citations per year and normalized total citations in the field of Yoga Education Research

Paper	DOI	Total Citations	TC per Year	Normalized TC
TICK H, 2018, EXPLOR	10.1016/j.explore.2018.02.001	278	30.89	5.61
BENEVIDES TW, 2020, AUTISM	10.1177/1362361320908410	186	26.57	10.31
SPINHOVEN P, 2018, BEHAV RES THER	10.1016/j.brat.2018.04.002	151	16.78	3.05
EYRE HA, 2017, INT PSYCHOGERIATR	10.1017/S1041610216002155	114	11.40	3.42
EYRE HA, 2016, J ALZHEIMER'S DIS	10.3233/JAD-150653	114	10.36	3.86
KARAMI A, 2018, INT J INF MANAGE	10.1016/j.ijinfomgt.2017.08.002	109	12.11	2.20
WEST J, 2017, INT J STRESS MANAGE	10.1037/str0000040	79	7.90	2.37
BUTZER B, 2017, J YOUTH ADOLESC	10.1007/s10964-016-0513-3	77	7.70	2.31
BAZZANO AN, 2018, PSYCHOL RES BEHAV MANAGE	10.2147/PRBM.S157503	71	7.89	1.43
CLARK D, 2015, FRONT HUMAN NEUROSCI	10.3389/fnhum.2015.00297	67	5.58	2.35

In Table 7 we list most influential publications from the dataset in terms of total citations, citations per year and normalized citation impact. With 278 citations and an annual citation rate of 30.89 Tick H. (2018) is of particular scholarly importance. In 2020 Benevides T.W. has the highest normalized impact of 10.31 and highest citations-per-year rate of 26.57. Other important citation studies by Spinhoven P. (2018), Eyre H.A. (2016, 2017), Karami A. (2018) & West J.

Collaborative network among scholars in Yoga Education Research

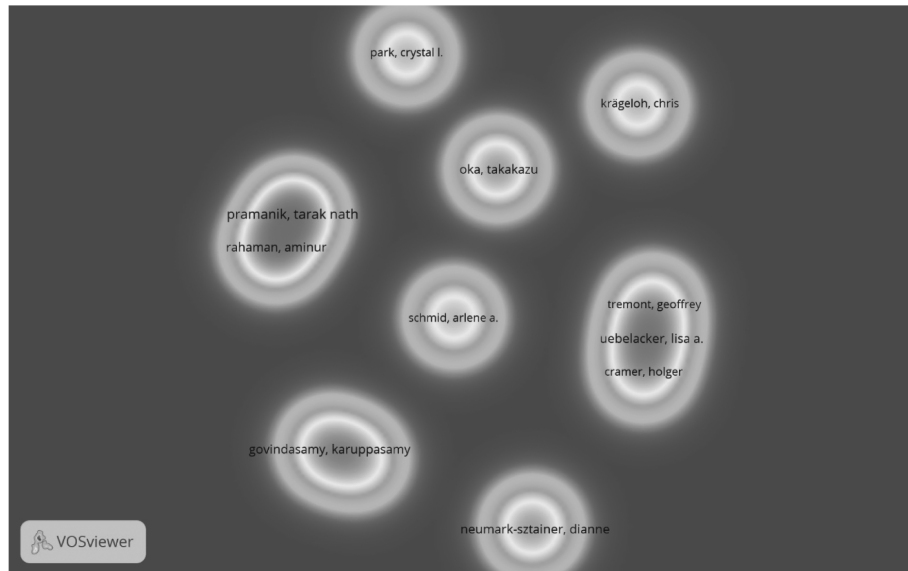


Figure 4: Co-authorship Density Map of Authors Illustrating Scholarly Collaboration in Yoga Education Research

In the VOSviewer author density map (Figure 4) you can see which researchers and collaboration sites are doing yoga education research. Warm colours indicate active author clusters like the central group of Pramanik, Tarak Nath and Rahaman, Aminur and other dense groups like Govindasamy, Karuppasamy and the team of Uebelacker, Lisa A., Tremont, Geoffrey and Cramer, Holger. More moderate authors like Park, Crystal L., Krageloh, Chris and Oka, Takakazu form peripheral clusters of a network dominated by some very collaborative groups.

Collaborative network among countries in Yoga Education Research

Table 8: Main 15 countries based on co-authorship (ranked by link strength)

Country	Documents	Citations	Total link strength
United States	175	3549	33
India	100	455	23
Australia	34	657	18
United Kingdom	35	593	17
Canada	15	128	10
Germany	17	277	9
Turkey	13	41	7
China	27	240	6

Netherlands	10	191	6
Brazil	10	106	5
Indonesia	11	22	5
Poland	11	58	4
Ukraine	13	92	3
Italy	14	111	2
Spain	19	205	2

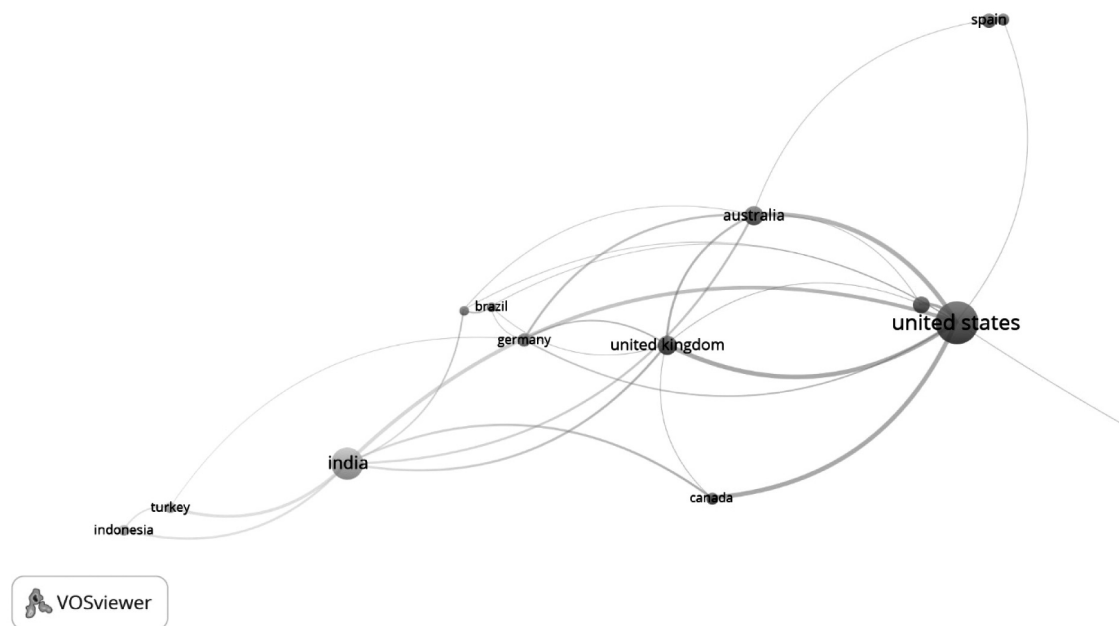


Figure 5: Co-authorship Map of Countries Illustrating Scholarly Collaboration of top 15 countries in Yoga Education Research (min number of documents of a country= 10)

Bibliometric country co-authorship analysis (Table 8, Fig 5) in VOSviewer revealed an international nature of yoga education research. Out of 68 countries that contributed, 15 with 10 documents or more were analysed. This included strong linkages between, and among, USA (175 documents, 3549 citations, and Western link to, and with, UK, Canada, and Australia; red cluster), India (100 documents, connections to Germany, Brazil and Indonesia; together with Indonesia and Turkey as a regionally emerging cluster; yellow), European-Latin American (Germany, Brazil, Netherlands; green) countries, and an Australian and a Spanish cluster (blue). The periphery structure revealed that leading countries in the world-wide network were able to sustain international collaborations and others formed regionally based collaboration.

Dominant research themes in Yoga Education Research

Table 9: Main 19 keyword based on co-occurrence analysis (ranked by link strength)

Keyword	Occurrences	Total link strength
yoga	191	184
mindfulness	46	74
stress	34	52
mental health	36	50
meditation	29	42
physical activity	32	41
adolescents	20	40
depression	23	36
anxiety	20	35
children	21	28
quality of life	14	23
well-being	12	20
covid-19	15	18
exercise	17	18
physical education	13	16
autism	10	14
health	12	14
rehabilitation	12	13
spirituality	10	10

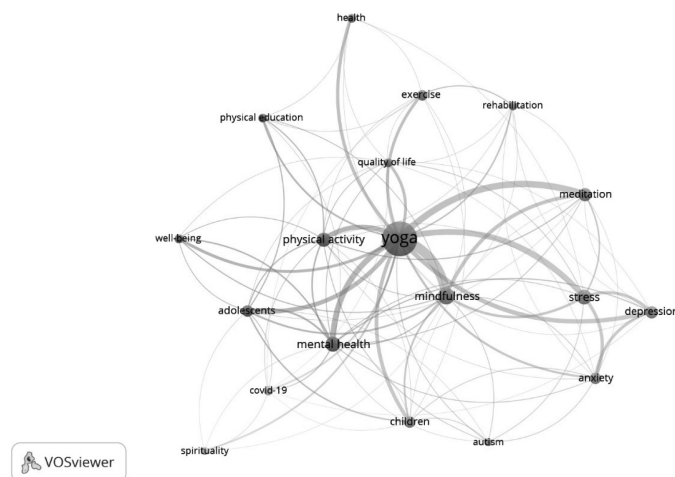


Figure 6: Co-occurrence Network of Author Keywords Illustrating Dominant research themes in Yoga Education Research

Bibliographic keyword co-occurrence (Table 9 & Figure 6) analysis in VOSviewer reveals yoga education research as a whole. From 1,713 keywords, at least 10 occurrences narrowed it down to 19 key terms - the most influential concepts in the field.

“Yoga” is the central and most frequent keyword (191 times;). It is a key thematic cluster (TLS = 184) that links several other major thematic clusters: the “blue cluster” is about health-related outcomes like exercise, quality of life, health, and rehabilitation - The physical and therapeutic dimensions of yoga research.

The red cluster has behaviours and education keywords like physical activity, mental health, adolescents, well-being and physical education which are related to yoga in educational and developmental contexts. “Green cluster” shows stress, anxiety, depression & autism as well as mental health issues that yoga might help with. It also includes mindfulness and meditation practices in the purple cluster - which is all about yoga’s contemplative aspect. Its yellow cluster includes recent and context-specific topics like COVID-19 and spirituality.

Strong links between these clusters point to a multidisciplinary and integrated research landscape in which yoga combines physical health and mental well-being behavioural education and therapeutic intervention.

Emerging research themes in Yoga Education

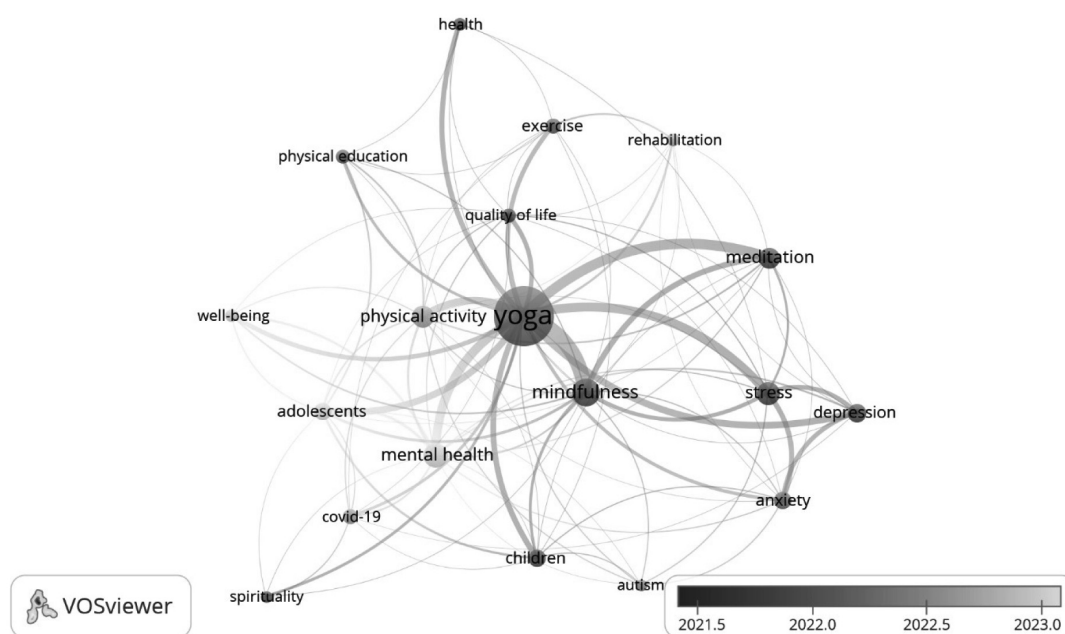


Figure 7: Overlay Visualization of Author Keywords Illustrating Emerging research themes in Yoga Education

In Figure 7 the keyword co-occurrence overlay map shows how research themes in yoga education have changed over time. Continually important central concepts like yoga and mindfulness are in mixed colouration. Earlier studies in purple or blue colouring dealt with

psychological health – stress, anxiety, depression, meditation, and quality of life. In green and yellow research more recent attention has been paid to applied topics like mental health, physical activity, adolescent populations, well-being and COVID-19 effects. Such a trend is in keeping with the trend towards practical, population-specific studies as well as a diversification of the field towards physical education and youth-oriented interventions.

DISCUSSION

This bibliometric analysis documents unprecedented growth over the last decade coupled with increased interdisciplinarity in yoga education research, matching what has been evidenced as being happening within broader populations: education in a holistic, well-being-oriented sense, consistent with Social-Emotional Learning. The recent spike in 2020 publication numbers reflects the interest in psychological resilience associated with the Covid-19 Pandemic. Collaborations are ubiquitous although predominantly involving international colleagues, and little evidence of international partnerships is found outside of the developed nations.

Research is driven primarily by the United States and India - as cultural transplants and from its scientific infrastructure - but there is some uneven geographic distribution of effort, which creates the potential for imbalance between Western and non-Western approaches. Authorship follows Lotka's law, with many 'occasional contributors' and a smaller number of authors with very high publication outputs, pointing to heterogeneity.

Central journals are mostly within psychology, complementary medicine, and health sciences and typically present yoga education as mostly related to treatment modalities. Key themes include mental health, mindfulness, physical activity with some emphasis on biomedical outcomes such as stress reduction, but not necessarily incorporating broader pedagogic or philosophic themes. Areas of emerging focus include adolescent wellbeing, physical education embedding, and pandemic topics, with increasing maturation toward an emphasis on practice of these in schools.

Key gaps are still found in pedagogy, curriculum development and teacher training, leading to potentially contradictory yoga incorporation and marginal education impact. Research on special populations such as children with autism is under-developed though promising initial findings exist. In summary, the scope and quantity of yoga education research is improving, but needs firmer theoretical foundations, increased empiricism and interdisciplinary engagement to fully unlock the educational promise offered by this practice.

IMPLICATIONS OF THE STUDY

This study underscores a growing relevance for yoga education research into student well-being and mental health via mindfulness and emotional regulation. Integrating yoga into curricula via evidence-based policies is emphasized, as is multi- and inter-disciplinary collaboration with an appeal for more international collaboration and involvement of non-traditional geographic sources. Key journal recognition along with major authors guide research attention. The major finding of the thematic analysis is that yoga education can

bridge the divide between health sciences and education research by enabling evidence-based interventions that serve integrated outcomes promoting physical as well as psychological learning.

LIMITATIONS OF THE STUDY

The study has limitations. First, the use of the Scopus database means that other study sources such as Web of Science or PubMed could be missing from the study, meaning there may be language and publication biases, due to yoga's global popularity. Bibliometric indicators employed place too much quantitative emphasis with less qualitative focus or methodological rigor, and citation measures are often biased by publication age or discipline. Finally, keyword-based analysis is incomplete due to variation in terminology. However, the study gives a good overall picture of the research landscape.

FUTURE RESEARCH DIRECTIONS

In future work bibliometric analyses should be extended to several databases like Web of Science and PubMed for a more global and non-English coverage. Studies need to go beyond outcome-orientated approaches to pedagogical and philosophical foundations of yoga education aiming for sustainable integration into curricula, teacher training, and institutions. Better methodological rigour in longitudinal designs, and random controlled trials and mixed methods will give better picture of long-term and context effects. Also, research should involve diverse learners - special needs students, marginalised groups & learners of different cultures. Finally, digital and online yoga programs, post-pandemic educational recovery and integration with other well-being frameworks are directions to build evidence and practice in yoga education.

CONCLUSION

In this study we present bibliometric data on yoga education research from 2015 to 2025 and its rapid and complex growth. The field is multidisciplinary - education - psychology - health sciences - with some international collaboration in some countries/journals. Yoga connects physical, mental well-being and education - from stress reduction to practical issues like student well-being and post-pandemic issues. But there are still gaps in pedagogical frameworks, curriculum integration & inclusive practices which are not widely adopted. Increasing theoretical clarity and methodological rigour as well as international partnerships will contribute to a better yoga education for all.

ACKNOWLEDGEMENTS

The authors acknowledge intellectual support, discussion and encouragement from colleagues and peers, during the conduct of this study.

DECLARATIONS

- Ethical compliance: Follows academic and ethical standards.

- Consent to participate/publication: Not applicable.
- Conflict of interest: None declared.
- Funding: No external funding.
- Data availability: Data can be provided on reasonable request.
- Use of AI Tools: *Grammarly* and *Paperpal* (Premium) were used only for language refinement and readability improvement.

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ROLE OF EDUCATION IN THE EMPOWERMENT OF TOTO TRIBAL WOMEN IN INDIA: PRISMA-BASED STUDY

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ABSTRACT

Education is a transformational aspect in empowerment of the marginalized communities, especially tribal women who experience various socio-economic disadvantages. The Toto tribe is also one of the Particularly Vulnerable Tribal Groups (PVTGs) in India with low literacy and access to formal education. It is a systematic review, which follows the PRISMA (Preferred Reporting Items of a Systematic Review and a Meta-Analysis) framework, to investigate the existing literature on the role of education in empowering Toto tribal women. The paper carries out the synthesis of the peer-reviewed articles, reports, and theses to examine the impact of education on social-economic status, decision-making power, health awareness, and gender equality among Toto women. The review indicates that education is very effective in increasing the level of awareness, self-reliance, and involvement in community development, but there are still structural problems, including poverty, cultural norms, and infrastructural constraints. The research concludes that sustainable empowerment requires specific educational interventions.

Keywords: Education, Women Empowerment, National Development, Toto Tribe, Prisma-Based Study.

INTRODUCTION

It is a known fact that education is a major tool of social change and empowerment especially to the marginalized populations like in the case of the tribal communities in India. The disadvantages to which tribal women are subjected are usually compounded by sex, race, and poverty. The Toto tribe, commonly found in the Alipurduar district in West Bengal, is one of the few and the most remote tribes in India. The Toto women have historically not enjoyed the benefits of formal education because of social cultural beliefs, isolation through geography and institutional support.

Over the last few years, education has become an important consideration in augmenting the positions of tribal women in terms of literacy, awareness and their involvement in socio economic activities. This paper critically analyzes the literature available towards enlightening on the role of education in empowering the Toto tribal women and the gaps in policy and practice.

LITERATURE REVIEW

The present study takes the help of PRISMA framework to systematically review the existing literature on the role of education play in empowering tribal women with special reference to Toto tribal women in India. A structured search of academic databases like Google Scholar, JSTOR,

ERIC and Government reports was undertaken using keywords like “tribal women education”, “Toto tribe”, “women empowerment”, “PVTGs in India” and so on. The initial search came up with 85 studies. After the removal of duplicates and irrelevant records, 42 studies were screened according to the titles and abstracts. Out of these, 25 studies were evaluated against the eligibility criteria by full-text review and finally, 18 studies were included for in-depth analysis.

Recent studies have also raised the issue of the economic role of education in empowering the tribal women. Tudu, Khatua and Panda (2025) found that education, vocational training, and economic resources significantly affect the level of empowerment among tribal women in Odisha. The study concluded that education is an important determinant of socio-economic independence and better livelihood chances.

Rasool and Vyas (2025) investigated tribal welfare policies in Jammu and Kashmir. They noted that educational policies, coupled with the self-help group program, improve financial independence and community participation among tribal women.

Another study by Bhutia and Kocherla (2025) further examined the efficacy of government schemes in ensuring tribal women’s education and found that awareness of welfare schemes and access to digital resources have significantly contributed to literacy and empowerment outcomes. However, socio-cultural barriers and domestic responsibilities still limit participation. The reviewed literature consistently indicates the role of education as an important factor in improving the socio-economic and psychological empowerment of the tribal women.

Kujur and Kujur (2018) investigated the educational status of Particularly Vulnerable Tribal Groups and concluded that low literacy rates among tribal women are closely linked with poverty, migration and lack of institutional support. The research highlighted that education could play a very important role in increasing social participation as well as reduce the cases of marginalization.

Das and Rai (2020) have investigated the nature of the relationship between education and women’s empowerment in tribal communities and has shown that educated women exhibit a higher level of decision-making power, economic independence, and awareness of rights. Their findings indicate that education plays a role in the empowerment of individuals and groups.

Sharma (2016) in a doctoral study studied the role of psychological factors namely self-esteem, achievement motivation towards academic performance. Although not specifically focusing on tribal women, the study has shown that education helps to increase self-confidence and motivation, which are an essential part of empowerment.

Sarkar (2014) discussed the effect of literacy on the empowerment of tribal women.

He found that education gives women the confidence and ability to engage in social and economic activities. The same study also found that educated tribal women were more likely to fight for children's education and better healthcare.

Sujatha (2012) on tribal education in India spoke volumes: access to quality education for tribal girls remains uneven. The researcher also argued that language barriers, lack of good school facilities and shortage of teachers contribute to the low educational attainment of tribal women.

Research by Mitra and Singh (2011) identifies education as a transformative element in improving the social position of tribal women by enhancing their participation in decision-making processes within their families and communities. The study concluded that literacy increases awareness regarding health, rights and livelihood opportunities.

Govinda and Bandyopadhyay (2008) analysed educational policies for marginalised communities. They found that the dropout rate among tribal girls has increased due to socio-economic constraints, early marriage, and a lack of culturally relevant curriculum. The authors suggested that targeted educational interventions are needed to empower the tribal women.

Similarly, Xaxa (2004) analysed tribal education in India and found that educational access among the tribal population remained far lower than that of other social groups. The study stressed that the absence of infrastructure, poverty and geographical isolation are the major barriers affecting the participation of tribal women in education.

Nambissan (2000) argued that education is a key factor in improving the socio-economic status of tribal communities and reducing gender inequalities. The study noted that the increase in literacy among tribal women plays a vital role in improving family welfare and participation in community Development.

Government reports on PVTGs (2014) show that communities such as the Toto tribe are extremely educationally deprived due to geographical isolation, poor infrastructure and socio-cultural barriers. These reports have brought the need for specific educational policies to correct gender disparities to the forefront.

Sen (1999) conceptualised development as freedom and emphasised on the expansion of the capabilities and choices of individuals through education. This theoretical perspective lends support to the argument that education is basic to the empowerment of the marginalized groups, among which are tribal women.

UNESCO (2015) reports further re-enforce that education promotes gender equality, better health awareness, and economic participation especially among women globally, including the indigenous population.

Finally, larger studies on educational inequality in India highlight the importance of improving women's education to reduce rural-urban inequalities and underscore its role in social Development. Research has shown that improving female literacy and delaying early marriage significantly impact educational attainment and empowerment outcomes for rural women.

A critical gap that could be identified in the literature is the absence of focused studies on Toto tribal women. Most research focuses on tribal women in general or other PVTGs and this leads to difficulty in drawing specific conclusions for the respective community. Therefore, there is a need for local and more in-depth studies that investigate the unique socio-cultural context of the Toto tribe.

OBJECTIVES

The main objective of this paper is to examine the significance of education in empowering women of Toto tribe in India. In particular, the research is expected to analyze the impact of education on socio-economic empowerment, decision-making ability, and health awareness and participation in social life of Toto women, as well as to pinpoint limitations in the accessibility and efficacy of education.

METHODOLOGY

The PRISMA model is used as a systematic literature review in this study. The databases used to find the relevant literature included Google Scholar, JSTOR, ERIC, and government reports. The keywords to be used were Toto tribe, tribal women education, women empowerment and PVTG education in India. Inclusion criteria were articles on tribal women published between 2000 and 2025 with a particular attention to Toto or other PVTG communities in India. There were both qualitative and quantitative studies. The criteria of exclusion included irrelevant studies, duplicate records, and articles that did not contain empirical evidence. The process of selection was in line with PRISMA steps, identification, screening, eligibility, and inclusion. Firstly, 85 papers were found, and 42 of them were reviewed upon elimination of duplicates. Based on the eligibility evaluation, 18 studies have been incorporated to be analyzed finally. The thematic analysis was conducted to extract and analyze data to determine common patterns concerning education and empowerment.

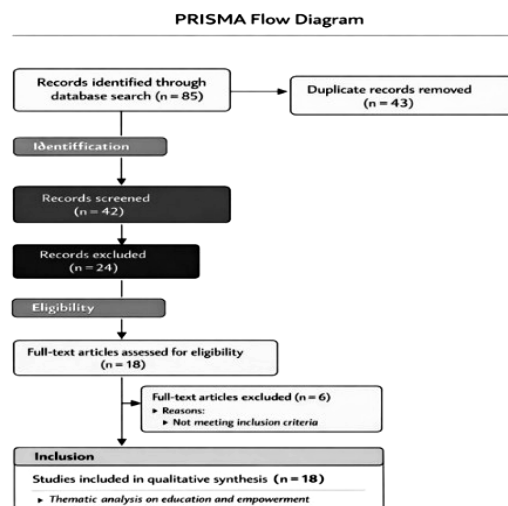


Figure 1: Prisma flow diagram

FINDINGS OF THE STUDY

The results indicate that education greatly increases self-confidence, autonomy and mobility among Toto women. It allows them to go against accepted practices and engage in the development of the community. There is also the enhancement of awareness about rights, schemes of government, and health practices and the quality of life improves.

Simultaneously, the problems of structure like insufficient infrastructure, the lack of women teachers, and socio-cultural constraints impede the educational results. Gender and tribal identity interplay only increases marginalization and targeted interventions are, therefore, needed.

The review results have shown that there is a positive and diverse influence of education on empowerment of Toto tribal women. Women who had received an education were more engaged in household decisions, health and hygiene awareness, and were more engaged in income earning endeavors. Literacy also helped in enhancing communication capabilities.

Nevertheless, the findings are also that there are still barriers, namely, early marriage, poverty, and lack of schools in remote locations, language issues, and cultural opposition to the education of women. The schemes of the government have enhanced access to education; however, the implementation is still irregular.

RECOMMENDATION

The Toto tribe is one of the most vulnerable tribal communities in India who are basically residing in Toto Para in Alipurduar district of West Bengal. Due to geographical isolation, poverty and lack of access to modern facilities, women in the Toto community have historically had several challenges including low literacy, limited employment opportunities and limited social participation. Therefore, enabling Toto women need to be done in a comprehensive and multidimensional way.

Education is deemed the most important factor on the empowerment of Toto women. In the past the literacy rate among Toto women was extremely low because of the lack of schools, economic hardship, and traditional social norms, which gave priority to household responsibilities to girls. However, with the growth of educational facilities and various government programs as well, such as scholarships and tribal welfare programs, there is an increase in the number of Toto girls going to school. Education helps women to develop awareness on their rights, increase their decision-making ability and participation in social and economic activities. Educated women can also serve as role models for younger people in the community.

Economic empowerment is another important element in improving the status of Toto women. Traditionally, the Toto economy relies on agriculture and forest-based life where women play an active role with farming and housework. However, their contributions tend to be undervalued. Providing vocational training, promoting self-help groups for women, and offering support to small-scale entrepreneurship can help women become financially

independent. When women earns they have more control over household resources and can improve their social status.

Health and social consciousness also play an important role in the empowerment process. Many tribal areas are plagued with problems such as the lack of healthcare facilities and lack of awareness regarding maternal health and a healthy diet. Strengthening healthcare services and awareness program can help Toto women to feel better. In addition, promoting women's participation in local government and community organizations can help to strengthen women's role in decision-making processes. Among these factors, education is the most important tool for empowering women to gain social and economic independence and to contribute to the development of their community.

CONCLUSION

The systematic review finds that education is an effective instrument to empower Toto tribal women, help them in socio-economic development, gender equality, as well as better well-being. Although there has been improvement in policy programs, access, quality, and cultural acceptance of education has major gaps in the provision of education. To meaningfully empower, the context-specific educational programmers, infrastructure strengthening, fostering female literacy and engaging the stakeholders of the community need to be undertaken. Longitudinal studies and localized interventions should be considered in future research to gain a deeper insight into the dynamic elements of education and empowerment of PVTGs.

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EVALUATION OF TEACHING–LEARNING COMPETENCIES OF PRE-SERVICE TEACHERS DURING SCHOOL INTERNSHIP

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ABSTRACT

In the context of teacher education, improving pre-service teachers' teaching efficacy is vital. The school practicum programmes provide student teachers opportunities to translate theory into practice in actual classrooms and enable them to develop necessary pedagogical skills. This research was carried out to evaluate the teach-learn potential of the pre-service teachers in their school internship programme. The quantitative approach, descriptive survey method was employed to carry out the research. A random sampling technique was employed to select two hundred pre-service teachers (N = 200) to participate in the study. To collect the data, a standardized structured questionnaire focusing on teaching–learning, classroom management, involvement in co-curricular activities, leadership traits and professional ethics was distributed. The data was analysed using descriptive statistics (mean, SD, Percentage- %) and Pearson's correlation analysis. The results also revealed that a great number of pre-service teachers were of average teaching competence; school regulations and professional ethics obtained the highest mean value. Teaching-Learning skills and Classroom Management skills were significantly, moderately and positively correlated ($r = 0.58$, $p < 0.01$) according to correlation analysis. These findings suggest that a number of effective teaching practices are associated with improved beginning teacher classroom management. The present study suggests that the internship programmes contribute positively either in the pedagogical or professional competences of the pre-service teachers. Increased focus on the hands-on component of teacher education programmes will further enhance the professional readiness of would-be teachers.

Keywords: Classroom Management, Co-curricular Activities, Pedagogical Competencies, Professional Competences, Teacher Education.

INTRODUCTION

Teacher education is necessary in order to guarantee that teachers are of a good quality and that they are adapting to the changes in the system. In teacher education, the internship is now understood as a full-time, on-site teaching experience in a single school that includes classroom management, curriculum development and instruction. The study's theoretical underpinnings are experiential learning theory and reflective practice as it is in experience that teachers are able to improve their professional competence. Previous studies have proven the importance of interns school programs in enhancing trainee teachers' subject matter teaching and professional development. For instance, relating to field experiences, Darling-Hammond (2006) emphasized that they help pre-service teachers to connect abstract theoretical concepts with specific teaching methods. Similarly, Korthagen (2010); Aagaard et al., (2025) found that the combination of theory and practice in teacher education programmes extremely positively influenced pupils' pedagogical quality. Also, supervised teaching practice enables to increase the professional capability and the reflective teaching of preservice teachers (Zeichner, 2010). Yet, as internship programmes are becoming more and more important, there are a few studies that have determined a extent in teaching competence that can be achieved by the pre-service teachers in the internship. Hence, this research examines the teaching-learning competence of the pre-service teachers in their school internship program as well as the correlation between their teaching skill and classroom management skill.

OBJECTIVES OF THE STUDY

- I. To know the pre-service teachers' competence in teaching-learning process in school during internship.
- II. To assess the prospective teachers' classroom management competence.
- III. To assess the teacher professionalism and school loyalty of trainee teachers.
- IV. To study the relationship between teacher-learner and classroom management in pre-service teachers.

HYPOTHESES OF THE STUDY

H₀₁ : Teaching-learning and classroom management-related skills were not significantly correlated in the group of pre-service teachers who were undergoing a school internship.

H₁₁ : Teaching-learning capabilities and classroom discipline skills of prospective teachers are positively correlated during the practice school period.

SIGNIFICANCE OF THE STUDY

This research is also of interest to policy makers and educators in teacher education institutions. It adds to the better understanding of how internship programs develop teaching competences among pre-service teachers. The findings could help teacher education institutions in developing training for internships as well as for the enhancement of

practicality. Furthermore, it contributes to the nascent literature on teacher education by offering empirical evidence of the professional development of student teachers within school internship programmes.

OPERATIONAL DEFINITION OF TERMS USED

1. Pre-Service Teachers: Preservice teacher education students who obtain coursework-based training before entering the teaching field.

2. Teaching–Learning Competencies: Specialized knowledges required in the teaching and learning processes. The particular knowledges, skills and abilities that a teacher should have to effectively plan, implement and evaluate the processes and products of teaching and learning.

3. School Internship: An internship-based program of study where pre-teachers observe and teach in a classroom and take part in various school activities.

4. Classroom Management: The ability of teachers to organize classroom work, maintain class control and have an impact on student learning.

METHODOLOGY

1. Research Approach: The current study used a quantitative research method.

2. Research Design: A descriptive survey research design was used to collect and analyze the data.

3. Population of the Study: The participants were pre-service teachers who were student teaching in school.

4. Sample of the Study: The sample consisted of 200 pre-service teachers (N=200) from different teacher training colleges under University of Burdwan.

5. Sampling Technique: Participants were selected using a simple random sampling method.

6. Data Collection Tools: A structured and standardized questionnaire was used to collect data, which was developed to evaluate different areas of teaching competencies including teaching–learning skills, class handling, leadership qualities, involvement in co-curricular activities and adherence to institutional regulations.

7. Data Collection Procedure: The questionnaire was given to the chosen pre-service teachers in their internship period. The participants were requested to give their answers on a five-point Likert scale from strongly disagree to strongly agree.

8. Statistical Techniques Used: Descriptive and inferential statistics such as were used to analyse the data collected including

- Mean
- Standard Deviation
- Percentage
- Pearson's Correlation Analysis

9. Ethical Considerations: The study was described to all participants and they provided informed consent.

RESULT AND ANALYSIS

The result of the present work was assessed and analysed by descriptive and correlational analysis to measure the teaching-learning competences of pre-service teachers in the school internship. Pre-service teachers (N=200) were surveyed using a structured questionnaire, which was divided into five sections related to teaching-learning skills, classroom management, involvement in co-curricular activities, leadership and management skills and compliance with institutional rules and regulations. The respondents were asked to rate the items on a 5-point Likert type scale from strongly disagree to strongly agree.

Table-1 Descriptive Statistics of Teaching–Learning Competencies of Pre-Service Teachers (N = 200)

Dimension	Mean (M)	SD ($\pm$)
Teaching–Learning Skills	3.88	0.62
Classroom Management	3.76	0.68
Engagement in Co-Curricular Activities	3.64	0.71
Leadership and Management Skills	3.70	0.66
Institutional Rules and Professional Ethics	4.05	0.58

Source: Data obtained from the initial survey by the researcher (2026)

Findings: Table-1 shows the descriptive statistics for various teaching tasks that the teachers-in-training were able to practice during the internship. Results revealed that school policies and professional ethics received the highest mean score (M = 4.05, SD = 0.58), which implies the pre-service teachers are aware of the best school rules, schedules and professional conduct during internships. Teaching–learning skills had a higher mean score (M = 3.88, SD = 0.62), which suggests that the trainee teachers were able to explain ideas clearly and had the right teaching techniques. Classroom management also received a moderate positive score (M = 3.76, SD = 0.68) as did Leadership (M = 3.70, SD = 0.66), suggesting student teachers can control and lead the class and is capable of bringing the class to the school management. The lowest rating was for participation in co-curricular activities (M = 3.64, SD = 0.71), although signifying a fairly good level of involvement from pre-service teachers.

Analysis: Table-1 displays the descriptive statistics of institutional regulation and professional ethics, followed by the highest mean value in teaching competences of pre-service teachers throughout their teaching practices. This means that training teachers are willing to obey with the school policy, maintain the punctualities and be professional on their practice teaching. It is also in line with the views of Darling-Hammond (2006) & Karacaoglu, (2025), who suggested that pre-established internship programs and mentoring services promote dedication to professional responsibility and ethical practice among pre-service teachers working in actual classrooms. Hence, the high mean score in teaching –learning skills

shows that the teaching practice experience contributes to a great extent in imparting professional skills in preparing lesson plans, explaining concepts and teaching with the aid of appropriate teaching strategies. This result support the result of Korthagen (2010), in which the student teachers are able to connect theory with practice and become more confident as teachers in their practical teaching experiences. The same to wards was found on the classroom management and leadership skills which both received moderate-to-high mean values suggesting the pre-service teachers were likely to manage and lead the class in the teaching –learning process. This finding is in line with the results of the study of Marzano, Marzano and Pickering (2003), which considered professional competences of the teacher and related specifically it's instruction related skills as essential for an effective classroom management. However, the slightly lower mean score for involvement in co-curricular activities might indicate the fact that the pre-service teachers perhaps had lesser chances to participate in or organize co-curricular activities while doing their internship. Comparative remarks were also made by Zeichner (2010) who notes that teacher education programs often place greater emphasis on classroom instruction than they do on co-curricular or leadership development activities.

The above finding is also in line with the assertion that internship is a key activity involved in the development of professional competences of pre-service teachers, particularly in terms of their pedagogical skills, class management and professional ethics.

Table-2 Overall Level of Teaching Competencies among Pre-Service Teachers (N = 200)

Level of Competency	Frequency	Percentage (%)
Low Competency	34	17%
Moderate Competency	92	46%
High Competency	74	37%
Total	200	100%

Source: Data obtained from the initial survey by the researcher (2026)

Findings: Table-2 shows the level of the teaching competencies that pre-service teachers had acquired through the internship. Results indicate that 46% of the respondents had a moderate level of teaching competency, 37% of them had a high level of competency. Only 17% of the contenders was considered incompetent. This means that the pre-service teachers generally the most professional competence in the training.

Analysis: According to the data in Table-2, 46% of the pre-service teachers possess a medium level of teaching competence, followed by 37% having a high level of competence and only 17% were at a low level of competence while working on the internship programme. This result indicates that the majority of the student teachers were able to obtain sufficient pedagogical and professional know-how from teaching at their school. The practicum period gives pre-service teachers a chance to put theory into practice, experience teaching strategies and increase their confidence in leading class activities.

Again, these findings are consistent with Darling-Hammond's (2006) claims that student teaching that is university supervised and situated within a strong teacher education program is crucial for learning to teach and becoming a professional teacher. Similarly, Korthagen (2010) mentioned that during the internship the experiences pre-service teachers have enable them to link theory about teaching learned in educational courses to concrete class room practice, equipping them to become better teachers. Furthermore, Zeichner (2010) suggested that field-based experiences (e.g., school internships) are paramount in enhancing professional development, reflective practice and pedagogical competence in student teachers. But the present finding is consistent with multiple findings that have demonstrated that the internship programs are an essential component of teacher training, as it allows the pre-service teacher to acquire practical abilities, to enhance teaching competences and forward to professional future responsibility.

Table 3 Correlation between Teaching–Learning Skills and Classroom Management
(N = 200)

Variables	r-value	Significance
Teaching–Learning Skills & Classroom Management	0.58	$p < 0.01$

Source: Data obtained from the initial survey by the researcher (2026)

Findings: The correlation analysis result indicated (Table-3) a moderate positive correlation ($r = 0.58$, $p < 0.01$) between the teaching-learning skills and classroom management skills of pre-service teachers. So it can be concluded that the trainees who were good teachers were also the best at organizing classroom work and in the development of a positive climate for learning.

Analysis: The results of correlation analysis revealed that a significantly moderate positive association ($r=0.58$, $p<0.01$) between teaching–learning skill and classroom management skill of pre-service teachers. This indicates that those trainee teachers, who had higher competence on instruction, at least, they will be able to think that they can provide better learning environment, keep order in their classroom and help their students. Good methodological teaching (ie, clear presentation of the content, active student involvement and well-prepared lessons) has also been linked with more disciplined classes and less disruption in teaching.

This confirms with previous researches which showed that teacher skill and classroom behavioural management were positively associated. Teaching-learning are largely determined by the teachers' pedagogical competence and their ability to manage teaching-learning activities (Marzano et al., (2003). Homjanet al., (2025); Evertson & Weinstein, 2006 & Burden, 2025 also showed that the most effective teachers (in terms of achieving positive student outcomes) were those who exerted the strongest management system. Further, Korthagen (2010) pointed out that pre-service teachers can simultaneously develop pedagogical and classroom management skills in their teaching practices within teacher education programs, as these are abilities honed in actual class room interaction. Therefore,

the current finding supports the prior researches, i.e., the improvement of teaching–learning skill for pre-service teacher can bring about enhancement of the pre-service teacher’s teaching management and the effectiveness as a teacher.

DISCUSSION

This study is concerned with evaluating the teaching and learning process of a pre-service teacher at school internship. Results showed that majority of prospective teachers’ level of overall teaching competencies in the good to excellent range and the pre-service teachers perceived that the internship had a strong contribution to enhancing their professional competencies. It was observed that most respondents are good at teaching, class management and professional behaviour. These findings are taken as support that student teach in schools can promote student teachers’ theory application in practice. Similar views have also been noted by Darling-Hammond (2006) who said that the acquisition of teaching expertise requires field-based experiences and substantive internship programs.

The descriptive results showed that institutional regulations and professional ethics were the highest mean scores, which was interpreted that the pre-service teachers in this research give a great deal concerning their school regulations and punctuality and professionalism during the practice of internship. This observation is consistent with Zeichner’s (2010) argument of ethical responsibility and professional conduct being fostered by student teaching in authentic educational settings. Furthermore, the high mean scores on teaching-learning and class management appear to suggest that the internship program helps students develop their skills in terms of educational competence and class supervision. Marzano et al. (2003) declared that good teaching practices are ones that include activities associated with effective classroom management and contribute positively to student behaviour in the classroom.

The correlation analyses showed a positive moderate relationship between teaching–learning skills and class management, suggesting that preservice teachers who are strong performers in instructional areas are also likely to be strong performers in class management. This finding corresponds with the assertion of Evertson and Weinstein (2006); Burden (2025) that knowledge of pedagogy and knowledge of classroom management are interrelated and developed simultaneously as a result of teaching practise. Assuch, Korthagen (2010); Aagaard et al., (2025) stated that “the combined application of theory and practice in teacher education programmes has a significant positive influence on professional growth of pre-service teachers”.

Overall, the findings of the current study highlight that school internship experiences significantly contribute to the enhancement of pre-service teachers’ pedagogical and professional competencies. Practical exposure in class teaching, interaction and support from mentor teachers are significant determinants of effective teaching. Therefore, preservice teachers are more likely to become effective teachers if they are taught by effective teachers.” Thus, teacher education institutions must continue to improve their internship programmes to nurture the teachers of tomorrow in every respect.

HYPOTHESIS TESTING OF THE STUDY

A Pearson's correlation analysis was conducted to examine the relationship between the teaching-learning and the classroom management abilities of the pre-service teachers. The outcome was that a statistically significant, moderate positive correlation was detected ($r = 0.58$, $p < 0.01$) between the two variables. H_{01} is therefore rejected and H_{11} is accepted. Which means that pre-service teachers with higher teaching-learning skills are more likely to effectively manage class activities and manage the class as a positive learning environment.

SUGGESTIONS OF THE STUDY

- Now that teaching practice is an integral part of the education of teachers, institutions should provide space for more practice teaching during practicum sessions to consolidate teaching competence.
- Programmes should highlight effective classroom management for pre-service teachers.
- Institutions should communicate to the students about enhanced participation in co-curricular and extra-curricular activities (like sports, cultural events and clubs) for leadership and organisational development.
- Facilitate training programmes/workshops on innovative and student centric teaching-learning methodologies at regular intervals.
- Mentoring/supervision of the internship has to be strengthened to provide trainee teachers with continuing support, mentoring and feedback.

EDUCATIONAL IMPLICATIONS OF THE STUDY

The findings have implications for teacher education programmes. Therefore, the result demonstrates that internship programme is very important in development of teaching-learning process, class management and professionalism of the pre-service teachers. Therefore, the TEIs need to focus on augmenting the practical component of teacher training; teaching practice, microteaching/lesson study, school observation among others. Moreover, the findings suggest that the integration of theory and practical classroom-based tasks has the potential to considerably better prepare future teachers for their profession. Besides, to what extent engaging pre-service teachers in co-curricular and leadership activities could foster their professional growth as individuals and teach in living situations.

LIMITATIONS AND FUTURE DIRECTIONS OF THE STUDY

The present study contains some limitations. First, the study was conducted among 200 pre-service teachers and thus the findings might not be generalized to the broader community of pre-service teachers. Second, the data were collected using self-report questionnaires and the respondents' perceptions and/or biases might have influenced the

results. Third, the study focused on particular dimensions of teaching competence and therefore other related factors such as mentoring support, school environment or teaching experience were not examined. Further research can be refined by considering more participants from different teacher education institutions. It is also recommended that future research may consider using a mixed-methods approach or a longitudinal design to examine further the development of pre-service teachers' teaching competences over time.

CONCLUSION

The study concluded that the school-based internship program is a significant contributor to the teaching-learning competence development among the pre-service teachers. The findings indicated that most of the trainee teachers were competent in teaching at average to high level and they were regarded higher in professional ethics, instructional skills and class management. The correlation analysis also revealed a significant positive relationship between teaching-learning and class management. These suggest that teaching practice is a crucial bridge with which the pre-service teachers build their professional identity. Therefore, in order to improve the effectiveness of teacher education and to provide for the future teacher the best possible preparation for his or her own classroom practice, there is a need to support the internship-course with appropriate guidance and training.

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EXPECTATIONS, CHALLENGES, AND OPPORTUNITIES OF THE NATIONAL EDUCATION POLICY (NEP) 2020: A MIXED-METHOD STUDY ON UNDERGRADUATE AND POSTGRADUATE STUDENTS IN WEST BENGAL

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ABSTRACT

National Education Policy (NEP) 2020 endeavors to make the Indian higher education system flexible, inclusive, and skill oriented. The current study adopted a convergent mixed method design to explore the expectations, challenges and opportunities of NEP 2020 among undergraduate and postgraduate students of West Bengal. The study was conducted on a sample of 348 students through convenience sampling. The data was collected through a structured questionnaire to find out expectation levels and through open-ended questions for understanding their thoughts. The statistical analyses included descriptive statistics, t-tests and ANOVA. The results show that expectation levels of students towards NEP 2020 are quite high and statistically significant difference between the expectation levels of UG and PG students was found. There was no significant difference across gender, location and type of institution and interaction effect between different variables was not significant. Analysis through thematic approach identifies infrastructural barriers, digital disparity, and execution deficit as challenges while the opportunity aspect comes in terms of multidisciplinary teaching, learning of skills and increase in employability. The policy has immense expectations; it can only realize its objectives if the gap between expectation and reality is bridged and efficient execution strategy is made.

Key words: NEP 2020, Expectations, Challenges, Opportunities, Higher Education.

INTRODUCTION

National Education Policy (NEP) 2020 has introduced some radical reforms for education in India. The policy proposes fundamental changes in teaching styles and the education structure which will modernize education from its traditional format. NEP promotes the inculcation of a learning culture that includes critical thinking, hands-on experiences and all-round development, in place of learning by rote. The aim is to develop well-rounded, smart, creative, and adaptable individuals who can take up the challenges of the New World in their field of expertise. The policy lays a huge emphasis on a student-centered and self-learning environment. Key reforms of NEP 2020 include: multiple entries/exits, integrated curriculum for cross-disciplinary studies and vocational courses and bringing the system closer to the global standard and the labor market requirements. The policy intends to promote

equitable education through inclusive learning by incorporating use of ICT tools and providing appropriate support services especially for vulnerable and disadvantaged sections of society. Implementation of these reforms are met with certain challenges like deficiency of infrastructure, inadequate preparedness at institutional and faculty level and socio-economic discrepancies. This phenomenon can be visualized in states such as West Bengal. Any policy on education can only succeed if the target audience (i.e., the students) of that policy are able to acquire and adapt the learning resources provided; consequently, student expectations and preparedness play a huge role in the success of any policy. In this regard, to understand the policy thoroughly, the present study focuses on the expectations of undergraduate and postgraduate students.

LITERATURE REVIEW

It is evident from above that NEP 2020 is the far reaching and reforming policy of Indian education system. Flexibility, multimodality and shift from teacher-centered to learner-centered learning are key features of the policy. The policy is aimed at developing students to correlate between theoretical knowledge with the practical one thus making them job ready in today's dynamic global context (Kumar et al., 2021). The policy has also been formulated with an intent to develop students' cognitive, emotional and social dimensions thereby achieving learning outcomes in accordance with the present international requirements in education (Joshi & Ahir, 2021; Aithal & Aithal, 2020). Student opinions towards NEP 2020 have shown significant differences depending on level of studies. Undergraduate students are found to have an affirmative outlook for curriculum flexibility, opportunities for multidisciplinary learning and career advancements. Postgraduate students however exhibit more negative outlook focusing on the practicality of the policy for specialized domains, continuity in research, and future careers in the same line (Eccles & Wigfield, 2002; Lazarus & Folkman, 1984).

However, while NEP 2020 provides for a forward-looking framework, there are several structural challenges that accompany its implementation. The lack of adequate infrastructure and technological resources, more commonly called the digital divide, impedes the policy implementation in a fair and just manner and excludes the rural and socio-economically deprived segments (Dhawan, 2020; Mishra et al., 2020). In addition, there is concern about teachers and the training required to adopt new teaching methodologies, digital resources and competency-based education approaches (Gupta & Gupta, 2022). Institutional and administrative barriers may also affect policy implementation. A shift to an interdisciplinary, multi-disciplinary and flexible education framework would require substantial reforms to the institutional structure, governance mechanism and curriculum, but bureaucratic rigidity, resource limitations and absence of a systematic strategy may inhibit such reforms and result in a disparity between policy and implementation (Tilak, 2021; Joshi & Ahir, 2021).

The above-mentioned studies throw light on the conceptual and structural aspects of the NEP 2020, yet there are many important areas that lack further exploration. Most of the above-mentioned studies are largely focused on policy and theoretical aspects, and little

empirical support at the student level is provided. There is a lack of focused research examining student expectations as a distinct construct. Comparative study on expectation at different levels of study is even more scarce. Moreover, most of the studies tend to discuss demographic variables individually in terms of their effects on other variables such as expectation, while interrelationships among the variables are not being examined critically. This suggests the limited perspective that is available of the ways by which multiple factors contribute to the students' responses to the changes implemented due to the policy.

Besides these issues, while many of the issues raised are very important, such as the ones related to infrastructure deficit and digital disparity, the discourse primarily continues to be largely descriptive in nature, without adequately incorporating students lived experience in qualitative perspectives. Also, the benefits derived from the policy reforms, such as enhanced learning skills, inclusive access and global competitiveness of education are being debated primarily in a theoretical framework. There is hardly any empirical attempt to relate these opportunities to student expectations and realities. Another drawback in literature is the region-specific research on NEP 2020. Specifically in West Bengal, variation among the institution types, availability of resources and the socio-economic strata of students may have considerable impact on the interpretation and application of policy reforms.

To fulfill these gaps there is a dire need for empirical study to address the students' expectations in relation to challenges and opportunities of NEP 2020 from integrated perspective incorporating the students' perceived expectations in conjunction with demographics and qualitative nuances of experience and perceptions of students. The present study has been undertaken with the aim of critically exploring the issue among undergraduate and post graduate students in West Bengal, considering the gaps identified.

OBJECTIVES OF THE STUDY

O₁: To compare students' expectations regarding NEP 2020 on academic level (undergraduate and postgraduate), gender (male and female), location (urban and rural).

O₂: To examine differences in students' expectations regarding NEP 2020 across institutional types.

O₃: To determine the interaction effect of academic level, gender and location with students' expectations regarding NEP 2020.

O₄: To identify the major challenges perceived by students in the implementation of NEP 2020.

O₅: To explore the opportunities of NEP 2020 for academic and career development.

O₆: To derive recommendations for strengthening and implementation of NEP 2020 in higher education.

HYPOTHESES

H₀1: There is no significant difference in the level of expectation from NEP 2020 between undergraduate and postgraduate students in West Bengal.

H₀2: There is no significant difference in the level of expectation from NEP 2020 between male and female students.

H₀3: There is no significant difference in the level of expectation from NEP 2020 between urban and rural students.

H₀4: There is no significant difference in the level of expectation from NEP 2020 among students of different institutional types (government, government-aided, self-financed, and university campus).

H₀5: There is no significant interaction effect of academic level, gender, and location on the level of expectation from NEP 2020.

METHODOLOGY

In this study, a descriptive survey design was employed to ascertain students' expectations for NEP 2020, its attendant problems and prospects for higher education. The study was carried out as a cross-sectional survey enabling data to be collected from undergraduate and postgraduate students at a particular time. Quantitative methods were utilized to test if student expectations differ based on certain demographics, and the interaction of students' level, gender and location.

In addition to quantitative study was a qualitative exploration component to get more insightful information regarding the problems and prospects of NEP 2020 as perceived by students. Qualitative data were collected through open-ended questions on the questionnaire, analyzed through thematic analysis to identify patterns and recurring themes of students' experiences. These results provided more meaningful context and enhanced the interpretive meaning of the study.

Therefore, this design may be classified as convergent mixed-method study where data from quantitative and qualitative approach were collected simultaneously and integrated during the interpretation stage to develop an in depth understanding of students' expectations as well as the underlying problem and opportunity of implementing NEP 2020.

Population and Sample

The study was conducted on graduate and post graduate students pursuing their studies in different higher educational institutions in West Bengal. Convenience sampling of 348 students was done. The details of the sample are: Academic level: Undergraduate 158, Postgraduate 190; Gender: Male 170, Female 176, Prefer not to say 2; Location: Urban 218 (62.6%), Rural 130 (37.4%); Type of institution: Government -86 Government aided -150 Self-financed (Private) -76 University Campus -36. The urban areas refer to areas that fall within the municipal corporations or metropolitan areas according to government records and rural areas are situated in non-municipal areas that are governed by panchayats and block administration which were checked through institution address and administrative status while collecting data.

Table 1. Demographic Characteristics of the Sample

Variable	Category	n	%
Academic Level	UG	158	45.4
Academic Level	PG	190	54.6
Gender	Male	170	48.9
Gender	Female	176	50.6
Gender	Prefer not to say	2	0.6
Location	Urban	218	62.6
Location	Rural	130	37.4
Institution Type	Government	86	24.7
Institution Type	Government-aided	150	43.1
Institution Type	Self-financed	76	21.8
Institution Type	University Campus	36	10.3

Tools for Data Collection

A structured questionnaire was used to measure expectations related to flexibility, skill development, employability, technological integration, and institutional preparedness. Responses were recorded using a five-point Likert scale.

Beyond the Likert-scaled items, there was a list of open-ended questions to gather students' qualitative views on the major obstacles in the implementation of NEP 2020, and on perceived opportunities and benefits of the policy. With these open-ended questions, we obtained qualitative data which were later analyzed with thematic analysis for recurring patterns and prevalent themes.

The overall expectation score was obtained by aggregating responses for all items; higher aggregated scores correspond to higher expectations about the policy. Including both quantitative and qualitative items allowed for a more thorough assessment of students' expectations.

Expectation Scale

There were altogether ten (10) items in the Expectation Scale which assessed student expectations on five core components of NEP 2020: flexibility and multiple pathways in academics, vocational training and development of skills, employment and career future, use of technology for education and institutional readiness and implementation of the policy. A five-point Likert type scale ranging from "Strongly Disagree" to "Strongly Agree" (1 to 5) was used, a higher score indicating a stronger expectation on NEP 2020. Selected open-ended questions were also incorporated to gather qualitative insights into student perspectives on both problems and opportunities that would later be integrated and contextualized with the quantitative data.

Validity and Reliability

Content validity was ensured through expert evaluation. Reliability analysis yielded a Cronbach's alpha value of 0.88, indicating a high level of internal consistency.

Procedure

Data were collected through online administration, ensuring voluntary participation and confidentiality.

Statistical Techniques

Descriptive statistics, t-tests, ANOVA, and factorial ANOVA were applied, along with effect size calculations where appropriate. The level of significance for all statistical tests was set at **0.05**.

RESULTS AND INTERPRETATIONS

This section presents the quantitative analysis of data collected from undergraduate and postgraduate students regarding their expectations from the National Education Policy (NEP) 2020. The results are presented table-wise along with interpretation.

Table 2. Descriptive Statistics of Expectation by Academic Level (UG & PG)

Variable	Group	N	Mean	SD
Expectation	UG	158	4.06	0.52
Expectation	PG	190	3.80	0.59

Table 1 presents the mean and standard deviation of expectation scores for undergraduate (UG) and postgraduate (PG) students. Descriptive statistics suggest that the expectations of the students were high with a good variability among them at different academic levels.

The mean expectation score for UG students was found to be 4.06 (SD=0.52) while for PG students it was 3.80 (SD=0.59). As can be observed, the mean difference shows that the expectation for NEP 2020 among the undergraduate students is slightly greater than that for postgraduate students.

Table 3. Hypothesis-wise Independent Samples t-Test (UG vs PG)

Hypothesis	Variable	Test	t	df	p	Effect Size (d)	Decision
H ₀ 1	Expectation	Welch t-test	4.459	≈344.84	< .001	0.48	H ₀ 1 Rejected

This resultant value of $t(345) = 4.459$ with $p < .001$ confirms that UG students and PG students significantly differ from one another in expectations of NEP 2020. The size difference (Cohen's $d=0.48$) is moderate in effect. (Effect Size Guide: Cohen's d , Partial Eta Squared (.01 .06 .14) & APA 7th Edition Reporting, 2026).

Thus, **H₀1 is rejected**, confirming that undergraduate and postgraduate students do differ significantly in their expectations of NEP 2020.

Gender, Location, and Institution Type Comparisons

Table 4. Gender, Location, and Institution Type Differences in Expectation

Hypothesis	Variable	Group Comparison (n)	Test	Statistic	df	p	Decision
H ₀ 2	Expectation	Male (170) vs Female (176)	t-test	t = 0.39	≈344	.697	H ₀ 2 Not Rejected
H ₀ 3	Expectation	Urban (218) vs Rural (130)	t-test	t = 0.35	≈346	.724	H ₀ 3 Not Rejected
H ₀ 4	Expectation	Institution Type (4 groups)	One-way ANOVA	F = 1.11	(3, ≈344)	.341	H ₀ 4 Not Rejected
<i>Note: Degrees of freedom are approximate due to listwise deletion of incomplete responses.</i>							

Independent samples t-tests and one-way ANOVA were conducted to analyze differences across gender, location, and institution type.

Gender

No statistically significant difference was found between male and female students in expectation scores ($p = .697 > .05$). Therefore, **H₀2 is not rejected**.

Location

No significant difference was observed between urban and rural students ($p = .724 > .05$). Hence, **H₀3 is not rejected**.

Institution Type

One-way ANOVA revealed no significant difference among students from different institutional types ($p = .341 > .05$). Thus, **H₀4 is not rejected**.

Hence, Students' expectations from NEP 2020 remain consistent across gender, location, and institutional categories, indicating a uniform outlook toward the policy.

Interaction Effects on Academic Level, Gender, and Location

Table 5. Three-Way ANOVA (Academic Level × Gender × Location)

Hypothesis	Variable	Interaction Effect	F	df	df	p	Decision
H ₀ 5	Expectation	Three-way interaction	1.11	1	≈ 338–344	.293	H ₀ 5 Not Rejected

Note: Minor variations in degrees of freedom occurred due to listwise deletion.

The interaction effect between academic level, gender and location on expectation was investigated using a three-way factorial ANOVA. The interaction effect was not statistically significant, $p = .293 > .05$. We fail to reject H_0 . So, there is no combined effect of these variables on expectation. The interaction effect was not statistically significant, as $p = .293 > .05$.

Thus the combined effect of academic level, gender, and location does not significantly influence students' expectations from NEP 2020.

DISCUSSION

In the present study, the undergraduate students reported significantly higher expectation scores ($M=4.06$, $SD=0.52$) than postgraduate students ($M=3.80$, $SD=0.59$). Welch's t-test confirmed this difference, $t(H=345) = 4.459$, $p < .001$, $d = 0.48$. The finding may be interpreted through Expectancy-Value Theory (Eccles & Wigfield, 2002). Qualitative findings highlighted academic flexibility and employability as major themes. Postgraduate students expressed comparatively cautious expectations, which may be understood through change-management perspectives (Kotter, 1996). No significant differences were observed across gender, location, or institutional type. The absence of a significant interaction effect indicates that the influence of academic level on expectations did not vary across gender and location groups.

Further, qualitative data analysis from the collected responses also revealed the same patterns of expectation toward NEP 2020 for undergraduates. Most undergraduate students reported high expectations and flexibility towards the reform and future developments, for example:

"Flexible courses will help us choose subjects according to our interests."
(Code: Academic Flexibility – Positive Expectation)

"It will help in better career opportunities and skill development."
(Code: Employability & Skill Orientation)

These responses suggest that undergraduate students view NEP 2020 as an enabler, thereby giving more freedom of choice, multi-disciplinary experiences, as well as a scope of employment. Postgraduate students held a more guarded view:

"Implementation may be difficult in current institutional setup."
(Code: Implementation Concern)

"Not sure how it will affect specialization and research continuity."
(Code: Academic Uncertainty – PG Level)

This shows that the perceptions are consistent with the argument that graduate students view the policy with a more critical and realistic perspective as conditioned by their immediate academic and professional interests. Moreover, expectations also do not vary statistically by sex, location, or type of institution. As can be seen in Table 3, the expectations do not vary significantly by these factors ($p > .05$). These results mean that all the groups have

structurally identical expectations. This observation is corroborated by the qualitative responses:

“Information about NEP is easily available through internet and college.”

(Code: Information Accessibility)

“Everyone has similar understanding about NEP from online platforms.”

(Code: Digital Dissemination Effect)

These excerpts further underscore how these various means-digital media, institutional messages, and mass policy messaging-were useful to guarantee consistency in awareness and expectations for varied audiences. Further, based on results of three-way factorial ANOVA (Table 4; $F=1.11$, $p>.05$) there was no interaction effect between academic standing, gender and location. The non-significant interaction effect indicates that the influence of academic level on expectations did not vary across gender and location groups. The qualitative responses show this independence as well.

“My expectations are based on course structure, not gender or background.”

(Code: Individual Academic Orientation)

“Location does not matter much as everything is online now.”

(Code: Reduced Geographical Influence)

These results are indicative of a trend toward policy benefits at the individual level, rather than filtered through society or demographics.

Table 6. Thematic Summary of Qualitative Findings

Theme	Code	Interpretation
Academic Flexibility	Positive Expectation	Students value choice-based learning
Skill Development	Employability Focus	Strong link with career prospects
Implementation Issues	Institutional Constraints	Concerns about feasibility
Digital Access	Information Dissemination	Equal exposure across groups
Academic Uncertainty	PG Perspective	Cautious expectations among PG students

Overall, the study proves that although NEP 2020 does elicit optimism, academic level is still the biggest separator of students, where UG students were remarkably more positive and PG students were critical. Simultaneously, lack of variability for gender, location, and institution type is testimony of a uniformly structured expectation environment, possibly due to good information diffusion by policy and through technology. It is by complementing the statistical results with qualitative accounts that we can add context to why the observed patterns may occur, giving a fuller picture of students' expectations. These results confirm that although policy awareness and expectations may be broad-based, the success of the policy relies on the policy creators taking steps to address implementation issues of sophisticated learners.

CHALLENGES OF NEP 2020 IMPLEMENTATION

Even though the vision presented in NEP 2020 is commendable, its implementation faces several structural and functional challenges. Inadequate infrastructure still is a major bottleneck, especially in institutions where there is shortage of funds. The prevalence of digital divide creates issues for equal access to tech-based learning environments.

Institutional readiness is a matter of concern as most institutions are unlikely to be adequately prepared for implementation of innovations like flexible curriculum and credit-based system. There are also problems between the framing and implementation due to administrative incompetence. Teacher readiness for introducing innovative teaching-learning methods becomes a key issue. Training and support required for the teachers is another factor which must be considered for effective implementation.

OPPORTUNITIES UNDER NEP 2020

NEP 2020 offers numerous transformative opportunities that will influence higher education in India in many ways. A primary opportunity includes fostering multidisciplinary learning by allowing students to move beyond distinct subject divisions and explore a diverse range of knowledge areas, a method that will result in improved creativity, analytical skills and resourcefulness, an aspect which reflects the global trend toward the expansion and flexibility of higher learning systems (Kumar et al., 2021). Skills based education is another one of the significant opportunities presented, which seeks to minimize the chasm between academic knowledge and industry requirements by instilling vocational training, work integrated learning and an internship program within the curriculum to make students ready for ever-changing job markets (Joshi & Ahir, 2021). Such moves to incorporate competency-based learning are opportunities as the business environment continues to evolve quickly. Another opportunity includes building an inclusive learning environment by providing equal opportunities and access to all learners, particularly the marginalized communities. Through various interventions, digital technology and adaptable delivery formats, NEP 2020 attempts to minimize educational disparities within higher education (Tilak, 2021). The NEP 2020 will ultimately result in increased global competition in higher education, by raising the profile of Indian HE with internationally acceptable standards of learning by promoting a spirit of learning and research which will allow students to thrive globally, and an expanded scope of education as Indian universities will compete on an international scale. Above all, a student centric system has been put in place, the idea is to make learning more effective by placing learners at the core of the learning process, allowing for flexible choices of subjects, multiple entry and exit points, along with tailored paths of learning which will result in better student engagement.

EDUCATIONAL IMPLICATIONS

These findings have important implications for teaching practice, policy formulation and institutional development for the implementation of NEP 2020. The need for a reorientation of curriculum to meet the expectations of students and policy goals is evident

at the teaching practice level. No longer does the focus of learning become a fixed curriculum. It is a fundamental necessity to restructure it to be multi-disciplinary, choice-based and competency-oriented. Skill-based education is important to bridge the gap between theoretical knowledge and its applications, thus enhancing the employability and flexibility of the students in a competitive socio-economic milieu (Kumar et al., 2021). Policy implications of these findings demonstrate a clear need for a strong implementation mechanism that would bring to fruition the policy goals of NEP 2020. A policy, though well-conceptualized, may prove to be futile without its implementation through different strata of governance. This requires clear-cut policy directives, mechanisms of accountability and coordination among stakeholders and need to ensure ongoing monitoring and assessment of the implementation progress, identifying deviations and gaps and the realization of the expected goals on due course and time. The institution level implications are also critical and need to embark on extensive capacity building and infrastructure development and augmentation of digital facilities to enable modern pedagogical practices, including the use of blended and online learning modes. The implementation of technology is reliant not only on the availability of hardware but also on the institutional readiness to adapt new pedagogical models and development of appropriate training programs and professional development of teachers to equip them with new set of skills required to implement reforms under NEP. As observed earlier, teachers play a vital role, and their readiness is indicative of implementation success. In short, NEP 2020 can be effectively translated to reality with effective coordination among all levels including curriculum.

RECOMMENDATIONS

Based on the findings of the present study, some recommendations can be put forward to ensure successful implementation of NEP 2020 and the gap between actual and expected outcomes. To begin with, institutions' infrastructure of higher education needs to be reinforced with more attention on their needs. These include physical resources, equipment facilities, and a learning environment to make multidisciplinary education, flexible curriculum and use of technology in teaching and learning easier and implementable. Besides that, there is a need to bridge the digital gap through strategic policies of NEP. Equal access for all students to devices, internet connectivity and online learning platforms should be provided, especially for students in rural and less privileged backgrounds, for a more equitable environment. Third, continuous training programs should be conducted and organized by authorities and institutions to train teachers in adopting new teaching styles and methods along with technology; for it has become necessary for all teachers and staff to work in a way of holistic education, where they get familiar with flexible curriculum, multidisciplinary education, interdisciplinary learning, and the importance of technology in the education process. Along with that, effective policies should be created for implementation and coordination of plans for effective monitoring. Last, orientation and awareness programs should be designed for students, faculty members and various institutional bodies to help them understand NEP policies better and adapt to them.

CONCLUSION

The present study has revealed that the NEP 2020 is positively related with the levels of expectations among the students and students positively feel that the policy is likely to be transformative in higher education. This means that students view NEP 2020 as a progressive framework that would allow students more flexibility and enhance the skills and career avenues relevant for present global needs.

Despite having a positive view, the present study has clearly outlined a large gulf between expectations and realization. Structural constraints such as infrastructural shortages, digital gaps, readiness of institutions and difficulties in the implementation of policy continued to remain impediments for the actualization of the objectives under NEP 2020. This shows the complex task of transforming policy vision into practice in varying socio-economic context of education.

In addition, the present study has also shown that despite no demographic differences, there have been differences across the level of studies. It would be essential to understand the views of students of different levels of studies. Especially at a higher level of studies, students have also expressed similarly high levels of expectation, and it is needed to consider such aspirations of higher-level students.

Henceforth, it is important to look beyond the visionary aspects of the policy and to focus on its efficient and effective implementation. Students' expectations from the NEP 2020 need to be addressed with practical solutions and to consider issues such as structural limitations, institutional development and participation of all stake holders involved.

ACKNOWLEDGEMENT

The authors sincerely acknowledge the participation of students whose responses contributed to this study. Appreciation is also extended to supporting institutions for facilitating data collection. AI-based tools were utilized solely for language refinement and formatting purposes.

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INTERGENERATIONAL TRANSMISSION OF ETHNOMEDICINAL KNOWLEDGE AMONG TRIBAL COMMUNITIES: A REVIEW OF RELATED LITERATURE

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ABSTRACT

Ethnomedical knowledge plays a key part in the health care systems of indigenous peoples and their cultural inheritance. Ethnomedical knowledge has evolved over time due to interactions with local ecosystems; it is passed on to younger generations using oral tradition, observation, and experience. Tribal communities have experienced significant socio-culturally oriented influences including modernization, and lifestyle changes, that have an impact on the continuation of ethnomedical knowledge. This review paper will describe the mechanisms by which ethnomedical knowledge is transferred within tribal populations and examine the social/cultural and environmental factors that influence whether ethnomedical knowledge is maintained or lost. The literature examined was based on ethnobotany, anthropology, and indigenous knowledge studies. A major focus of this paper is the family structure, traditional healer, community practice and gender dynamic components of knowledge transfer. Also discussed were new challenges that include urbanization, formal education, and cultural transition that can contribute to loss of traditional medicinal knowledge. Finally, the author emphasized the need to document ethnomedical knowledge and promote community involvement for continued use of ethnomedical knowledge.

Keywords: Knowledge Transmission, Indigenous Knowledge, Ethnomedicinal Knowledge, Tribal Communities, Traditional Medicine

INTRODUCTION

Ethnomedicinal knowledge is one of the major components of indigenous knowledge systems and has provided a basis for health care delivery amongst tribal and rural communities around the globe for thousands of years. Ethnomedicinal knowledge was developed through generations of interaction with native ecosystems. Ethnomedicinal knowledge involves knowing how to identify, prepare and apply medicinal plants and other natural products for disease prevention and treatment. The study of ethnomedicine has become an increasingly important area within Ethnobotany and Medical Anthropology because studying ethnomedicine provides insight into the interconnectedness of biodiversity; cultural tradition; and indigenous health care systems (Dandapath, 2024). Traditional medicine plays an important part in fulfilling primary health care needs in many areas of the world, especially those located in developing countries, where access to modern health care services may be limited (Landi et al., 2022).

Traditional medicines are primarily based upon ethnomedicinal knowledge that exists within tribal communities. Tribal people's close relationship with their environment has allowed them to acquire extensive knowledge regarding the medicinal properties of plants, animals and minerals present in their environments. Many tribes in India have well established ethnomedicinal traditions that have existed for hundreds of years. The majority of these tribes use traditional healing methods and locally available natural materials (plants) to treat a vast array of health problems. Traditionally practiced ethnomedicinal methods are not only used for treating illness but are also an integral part of a tribe's belief system, ritualistic activities and spiritual practices (Dandapath, 2024). Indigenous cultures tend to view all aspects of life as being connected to each other.

Another important aspect of ethnomedicinal knowledge is the method by which it is transferred from generation to generation. Scientifically documented information is typically passed down formally through educational institutions and written documentation. In contrast, ethnomedicinal knowledge is usually passed down informally through oral communication and hands-on experience (Kalu, 2022). The informal transmission of ethnomedicinal knowledge is typically accomplished through day-to-day social contact, observing others, and learning through participating in community-based events. Elderly people who are experienced practitioners of ethnomedicine, elder herbalists, and elderly knowledgeable community residents are responsible for transmitting ethnomedicinal knowledge to younger generations. Younger individuals typically acquire knowledge related to medicinal plants and ethnomedicinal treatments by accompanying their elders on trips to the forest, participating in traditional ceremonies and helping their elders prepare medicinal plant remedies. Through this type of intergenerational knowledge sharing, ethnomedicine can continue to exist as an essential part of the culture of the community (Kalu, 2022; Seerangan & Ravi, 2025).

The transfer of ethnomedicinal knowledge has faced several major obstacles to its continued passage today. Ethnomedicinal knowledge is rapidly changing because of the effects of rapid economic development, migration into urban centres and changes in lifestyles such as modernization, and urbanization. The younger generation of people living in many tribal cultures is now less inclined to engage with the traditional practices of their elders. This is likely due to the influence of formal education systems, the impact of market-based economies and the greater access they have to modern health care services. Migration into urban centres to find work also breaks up the traditional networks used to share knowledge. Therefore, valuable ethnomedicinal knowledge developed over thousands of years by many indigenous peoples may be disappearing (Kalu, 2022).

Another key factor leading to the decline of ethnomedicinal knowledge is the diminishing availability of natural resources. Deforestation, habitat destruction and loss of biodiversity are resulting in the decreased availability of many medicinal plant species that are traditionally used to develop medicines (Dandapath, 2024). Because ethnomedicinal knowledge is often very tied to a specific geographic location or ecosystem, when native plant or animal species become extinct so does some portion of the traditional medicine associated with those species. In addition to the loss of natural resources there is also a great deal of

intangible knowledge related to traditional remedies that will be lost if older knowledgeable individuals die before passing on their skills to younger generations (Dandapath, 2024; Kalu, 2022).

Although the challenges of documenting and preserving ethnomedicinal knowledge are significant, it still retains tremendous value both for local indigenous populations as well as for the advancement of science and medicine. For example, many modern pharmaceuticals were created based upon medicinal plants identified through indigenous knowledge systems. As a result, there is an increasing interest in studying and documenting ethnomedicinal knowledge among researchers, government officials and conservationists. Studying how ethnomedicinal knowledge is passed down from one generation to another in tribal communities can help identify ways to protect and conserve these traditions for future generations (Seerangan & Ravi, 2024; Seerangan & Ravi, 2025).

Considering the importance of understanding the transmission of ethnomedicinal knowledge in tribal communities, it is equally important to understand current research concerning this topic. Although previous studies have documented how ethnomedicinal knowledge is transferred among tribes (e.g., through oral tradition, apprenticing with elder traditional healers, and family-based informal learning) (Landi et al., 2022; Kalu, 2022; Kurtkoti & Joshi, 2024), these studies have focused primarily on how individual tribes use traditional knowledge systems. Although research has shown that many variables (social organization, sex role expectation, cultural values and environmental factors) can influence how traditional medicinal information is passed down through generations, current studies addressing this issue are widely dispersed across different fields of study and regions. As such, it will be important for researchers to synthesize the available literature in this area.

The current article will review the literature that addresses the issue of transferring ethnomedicinal knowledge from one generation to another within tribal communities. The articles reviewed are primarily focused on ethnobotanical and anthropological research. The study has been able to examine how traditional paths of transmitting this type of information exist, what influence (social structures, gender roles, beliefs about a community's culture and environment) exists regarding how this information is transmitted, and what obstacles exist to preserve indigenous medicinal knowledge. Understanding all of these factors can provide insight into successfully implementing conservation programs intended to aid in preserving indigenous medicinal knowledge and promoting sustainable cultures and ecosystems.

LITERATURE REVIEW AND RESEARCH GAP

Most recent research indicates that the transfer of ethnomedicinal knowledge primarily takes place via family/community-based learning, apprenticeship and direct observation. Involvement with traditional medicine practitioners, elderly individuals, and their respective families and especially female relatives, have been associated with the transfer of ethnomedicinal knowledge (Landi et al., 2022; Kurtkoti & Joshi, 2024; Kalu, 2022). The preservation of medicinal plants has also been influenced by many factors including cultural traditions, religious values, environmental relationships and social gender roles (Dandapath,

2024; Seerengan & Ravi, 2024). While there are several ways to sustainably conserve traditional healthcare systems and ensure long-term viability of ethnomedical knowledge, the major threats include rapid modernization/migration, lack of interest among younger people in ethnobotanical/biodiversity conservation, lack of effective intergenerational knowledge sharing, loss of biodiversity resulting from habitat destruction/environmental degradation, and the influence of formal education which results in less dependence on traditional treatment options (Kalu, 2022; Dandapath, 2024). As a result, researchers are developing ways to document knowledge, create digital libraries containing medicinal plant related information, promote the conservation of biodiversity, support community-based education and incorporate traditional knowledge into both education and medical fields to insure long-term sustainability of traditional health care systems (Seerengan& Ravi, 2025; Landi et al., 2022; Kalu, 2022). A notable void exists in cross-disciplinary/regionally focused analyses that examine the actors/processes involved in the intergenerational transmission of ethnomedicinal knowledge found among indigenous/traditional populations. The purpose of this study is to address this void by synthesizing data collected from multiple sources to conduct an integrated analysis of how ethnomedicinal knowledge is transferred over time.

RESEARCH QUESTIONS

1. In what ways is ethnomedicinal knowledge passed down through generations?
2. What part do elders, healers, and family members play in conveying this knowledge?
3. What obstacles hinder the preservation of ethnomedicinal knowledge?
4. What measures can be taken to protect traditional medicinal knowledge?

METHODOLOGY

Research Design

This is an exploratory study that utilizes a narrative analysis methodology to investigate extant research regarding ethnomedical knowledge within tribal cultures. This literature review will compile current academic scholarship concerning how traditional knowledge is transmitted through tribal culture, who plays a role in transferring knowledge, what barriers exist to preserving ethnomedical knowledge, and methods that can be employed by these cultures to preserve their ethnomedical knowledge base.

Search Strategy

The most pertinent articles were found by searching all major academic journals using the three most comprehensive search engines (Google Scholar, Scopus and Web of Science) as these three are among the largest and most comprehensive search engines available today for scholarly publications, specifically with respect to the disciplines of ethnobotany, anthropology and traditional medical practices.

In order to identify the relevant articles, I used both key words and phrases to perform the search. Some of the primary key words that I utilized were:

- Ethnomedicinal knowledge
- Traditional medicinal knowledge
- Indigenous knowledge systems
- Ethnobotany
- Knowledge transmission
- Intergenerational knowledge transfer
- Tribal medicine
- Indigenous healthcare systems

These keywords were employed both separately and in combination using Boolean operators like AND and OR to locate pertinent literature. So the further relevant publications were discovered by examining the references lists of the selected articles.

Screening and Eligibility Criteria

A preliminary scan of literature revealed an extensive body of work related to Ethnomedicine and Indigenous knowledge systems. Abstracts and article titles from this body of work were examined as they pertained to the objectives of this study. Articles focusing exclusively on ethnomedicinal practices, the transmission of knowledge and/or Indigenous health care delivery systems were considered for closer scrutiny. Following close scrutiny, the full texts of the selected articles were evaluated for their relevance to be included in the review. Ultimately, only studies which provided insight regarding how ethnomedicinal knowledge is transmitted, preserved and culturally contextualized were analyzed.

Inclusion Criteria

The following criteria were used to include studies in the review:

- Scholarly articles that have undergone peer review, academic publications, and research reports
- Investigations centered on ethnomedicinal knowledge or traditional healing practices
- Research exploring the transmission of knowledge within indigenous or tribal groups
- Publications available in English
- Studies offering empirical or theoretical perspectives on ethnomedicine, indigenous wisdom, or traditional healthcare systems.

Exclusion Criteria

Studies were excluded from the review if they met any of the following conditions:

- Articles that do not pertain to ethnomedicine or traditional medicinal knowledge
- Research that exclusively examines the pharmacological or laboratory aspects of plants without addressing cultural or knowledge transmission elements

- Non-scholarly sources like blogs, magazines, or opinion articles
- Publications lacking adequate details on ethnomedicinal practices or knowledge systems.

Quality Assessment

The literature was evaluated for both reliability (i.e., credibility) and relevance using several factors, including:

- The quality of the publishing outlet, i.e., peer review status of the journal and/or publisher reputation.
- Clearly articulated objectives and methods used by each study.
- Correspondence with ethnomedicinal knowledge and/or mechanisms through which it is transmitted.
- Discussion depth regarding cultural/social/ecological dimensions of traditional knowledge.

In assessing these studies, those providing specific examples of ethnomedicinal practices, knowledge transmission mechanisms and/or socio-cultural contexts were given priority in the assessment.

Literature Selection Process

To find relevant literature for identifying processes by which ethnomedical information is transmitted from one generation to another among tribes, a systematic approach was used to identify all relevant studies that addressed the transmission of ethnomedical knowledge. An exhaustive search of literature databases (Google Scholar, Scopus and Web of Science) generated approximately 75 articles that focused upon ethnomedicine, indigenous knowledge systems, and traditional medicine. Upon removal of duplicate entries, there remained 53 articles that were then examined for relevance to the objective of the research.

Titles and abstracts of the 53 articles were evaluated to assess whether each article supported the research objectives. As a result of this evaluation, 18 articles were eliminated since they provided only the results of pharmacological evaluations of medicinal plants and did not address either ethnomedical knowledge or how it is transmitted.

Of the remaining 35 articles, a comprehensive review was conducted; subsequently, 22 articles were identified as supporting the objectives of the research and therefore used for the thematic synthesis of literature regarding the transmission, retention, and challenges associated with ethnomedical knowledge within tribal populations.

DATA ANALYSIS

In an attempt to analyze the selected literature in the form of a thematic analysis, major themes regarding how ethnomedicinal knowledge is transmitted were identified and grouped together. In addition to this, these themes included; traditional methods of passing on knowledge, ways in which community leaders such as elder individuals and healers are involved in knowledge preservation, barriers to preserve this type of knowledge, and also

strategies to protect indigenous medicinal knowledge. The results from the literature review were utilized in conjunction with one another to create an overall description of the various elements and processes that affect the transmission of ethnomedicinal knowledge in tribal communities.

RESULTS AND DISCUSSIONS

Ethnomedical knowledge shared among tribal societies has traditionally been passed down to younger generations using non-formal, culturally based means. The primary method used to pass on this type of knowledge differs from modern western medicine. Western medicine passes along its knowledge formally via education and documentation whereas ethnomedicine is typically passed on verbally and through hands-on experience. Informal ways of passing along information such as verbal conversation, observation of others practicing traditional activities, and direct involvement in a community's traditional practices are the main ways that ethnomedical knowledge is transferred from one generation to another (Etkin, 2005; Balick & Cox, 1996; Jain, 1991). The primary way to pass on ethnomedical knowledge is through an oral tradition. Elders pass on knowledge regarding medicinal plants, treatment methods, and preparation methods for these plants by sharing stories, conversing informally with others, and interacting with family members throughout their daily lives. By passing on knowledge in this manner, it can become part of a community's culture and traditions (Bussman, 2013). Younger people in many of these tribal societies have learned about medicinal plants by observing the older people collect them when they accompany those older adults into the forests (Pardo-De-Santayana et al., 2005; Reyes-Garcia et al., 2009). Another way to pass on knowledge about ethnomedicine is through being an intern for a traditional healer. Some tribes have selected people that they feel would be good interns. The selected interns stay with the traditional healer for extended amounts of time. During this time, the traditional healer teaches the intern(s) how to identify different plants that are used for medicine and also how to make medicines using the identified plants. In addition, traditional healers teach the interns about all other aspects of ritual healing (Schultes & Raffauf, 1990; Giovannini et al., 2009). These types of internships help keep valuable ethnomedical knowledge alive within the tribe.

In addition, family-based transmission plays a central role in maintaining traditional knowledge systems. Ethnomedicinal practices are often passed down within households, particularly from parents or grandparents to younger family members (Caniago & Siebert, 1998). Women, who frequently manage household healthcare, also contribute significantly to the transfer of medicinal knowledge related to common ailments and herbal remedies (Howard, 2003). The results indicate that the transmission of ethnomedicinal knowledge is predominantly dependent on oral communication, hands-on experience, and learning that is deeply rooted in social contexts, all of which are closely intertwined with cultural traditions and ecological knowledge systems.

Ethnomedicinal knowledge in tribal communities is preserved and passed on from generation-to-generation through specific individuals within each society. Most of this type of knowledge is held by community elders, family members and traditional healers. In the

majority of tribal communities' elders have traditionally maintained extensive knowledge of both ecological and medicinal aspects of local ecosystems. Elder's experience interacting with an ecosystem over an extended period and as a result possessing a wealth of information relative to local plant species, techniques of healing and available environmental resources is well documented (Gadgil et al. 1993). Additionally, elder's provide guidance to younger generations providing them with the necessary cultural knowledge required to maintain the continuation of traditional medicinal practices. Traditional healers/herbalists/shamans/medicine men/women also play a major role in preserving and passing on ethnomedicinal knowledge. Traditional healers typically specialize in either diagnosing ailments and preparing medicinal plant treatments and/or conducting spiritual rituals for healing purposes (Bussmann & Sharon, 2006; Etkin and Elisabetsky, 2005). Typically, this type of knowledge is passed down to select apprentices or close relatives to prevent the misuse of medicinal resources. Family structure provides another mechanism for the passage of ethnomedicinal knowledge between generations. Children often learn about medicinal plants while engaging in daily activities such as farm work, food gathering, or walking through forests with their parents/grandparents (Reyes-García et al., 2009). This process allows children to become familiarized with local floras and traditional treatment methods for various ailments. Additionally, gender roles can also influence how ethnomedicinal knowledge is transferred across generations. Research indicates that women hold a large amount of knowledge pertaining to home health care, including remedies for common ailments, childbirth and childcare (Voeks and Leony, 2004). Therefore, it appears that women contribute significantly to the inter-generational transmission of ethnomedicinal knowledge within families. These studies show that ethnomedicinal knowledge is not equally distributed throughout a tribe's population, rather it is primarily concentrated among specific social actors who are influenced by their position within a culture, social system, and relationship with their environment.

Despite its cultural and ecological significance, ethnomedicinal knowledge is increasingly modernized, and cultural changes have challenged and changed traditional ways of living and knowing. Modern health care has also limited the use of traditional remedies by younger generations due to increasing exposure, adoption of a modern lifestyle and migration from rural areas into cities where the opportunity to learn about traditional medicines through day-to-day interaction with elder healers are decreasing (Voeks & Leony, 2004; Iqbal et al., 2021). Environmental degradation and biodiversity loss have resulted in the reduction of plant species which are sources of medicinal plants. This loss of plant species is often due to deforestation, conversion of lands for agriculture, etc. (Schultes & Raffauf, 1990; Hamilton, 2004). A number of other factors contribute to the vulnerability of ethnomedicinal knowledge systems. Much of the ethnomedicinal knowledge system is still based upon oral traditions. The death of elder knowledgeable individuals can result in the permanent loss of valuable cultural knowledge (Jain, 1991; Balick & Cox, 1996). Additionally, there are concerns regarding the misappropriation of traditional knowledge and the application of western intellectual property laws to traditional knowledge (Bhukta, 2020). These concerns will limit the ability of indigenous communities to share their knowledge with outside researchers and institutions. As such, it appears that ethnomedicinal knowledge systems are currently experiencing considerable pressure threatening their continued existence.

Given the numerous threats to Ethnomedical Knowledge Systems, various options have been suggested by researchers and policymakers as ways to support the preservation and sustainable use of such knowledge. Among these options, the most frequently cited has been the systematic documentation of traditional knowledge through ethnobotanical research, as well as through the implementation of community-based recording initiatives (Hamilton, 2004), (Jain, 1991). Documentation provides value for preserving information regarding medicinal plants and healing methods and creates scientific awareness about the cultural and ecological significance of Indigenous Knowledge Systems. Thus, collaborative research by Academic Institutions and Local Communities serves as a vital support mechanism for the preservation of Traditional Knowledge. Knowledge Revitalization and community-based approaches also serve as a primary means through which this objective may be achieved. The creation of programs focused on providing cultural education, workshops, and training locally can provide youth with the opportunity to gain experience in learning about traditional medicine and strengthen the knowledge transmission within their respective communities (Reyes-Garcia et al., 2009) (Ross et al., 2024). Protection of Biodiversity is equally as important to preserve Ethnomedical Knowledge. Since traditional medicine depends on local ecosystems, preserving forest lands and natural habitats contributes to the preservation of medicinal plants (Hamilton, 2004). Additionally, there is a need to develop a policy framework and legal mechanisms to protect indigenous knowledge from exploitation. National policies and international agreements that recognize Indigenous Intellectual Property Rights are needed to ensure that traditional knowledge holders receive fair compensation for the use of their knowledge (Bhukta, 2020). In summary, the studies suggest that the preservation of Ethnomedical Knowledge is best pursued through a multidimensional approach that includes both Cultural Preservation, Ecological Conservation and Community Empowerment.

CONCLUSION

The value of the information contained in ethnomedical knowledge lies in its contribution to the rich diversity of indigenous knowledge systems and to the health care traditions practiced by tribal peoples. This literature review demonstrates that most ethnobotanical knowledge is passed on using methods of traditional and informal character, i.e., by word-of-mouth, by example and experience. These “keepers” of the tradition include elder tribal people, healers and family members who assist in passing down the knowledge to each successive generation. Younger members of the tribe learn ethnobotanical knowledge, healing practices, and other elements of traditional health care practices from older members during everyday social interactions, by participating in various aspects of the culture, or by serving as apprentice to more experienced healers.

While ethnobotanical knowledge continues to be an important part of many of the world’s indigenous cultures; it has been subject to increasing threats due to rapid sociocultural changes brought on by modernization, urban migration, formal schooling and environmental degradation (deforestation) leading to increased rates of loss of biodiversity. A lack of written records documenting ethnobotanical knowledge and decreasing numbers of elder knowledgeable individuals also increase the likelihood of ethnobotanical knowledge loss.

Although there are numerous threats to ethnobotanical knowledge systems, they continue to play a vital role in the preservation of culture, in the conservation of biological diversity and as potential sources of new medical therapies. Therefore, understanding how ethnobotanical knowledge is transferred among the community is crucial for maintaining this knowledge system. The literature review emphasizes that preserving ethnobotanical knowledge is a joint effort requiring collaboration among local communities, researchers, policy makers and/or conservation organizations. Strengthening ethnobotanical knowledge systems can occur when local communities are able to integrate their traditional knowledge systems into viable long-term development programs.

RECOMMENDATIONS

Drawing from the conclusions of this review, various suggestions can be made to encourage the conservation and sharing of ethnomedicinal knowledge within tribal communities.

Documentation of Indigenous or Traditional Knowledge Ethnobotanical studies, as well as community-based and digital documentation processes, are critical to documenting ethnomedicinal knowledge. Preserving this knowledge is necessary so that it will continue to exist after older individuals who have passed down this knowledge pass away.

Intergenerational Transfer of Indigenous/Traditional Knowledge Programs which promote the exchange of ideas between elders and young people, such as community-based workshops, training programs, and educational programs related to culture and tradition, should be supported to ensure that traditional knowledge continues to be transferred.

The first step toward establishing a sustainable future for the medicinal plants found on Earth's surface would be the active participation of tribal (Indigenous) communities in all aspects of conserving and sustainably using these plants. In order to achieve this goal, we must conserve the entire forest ecosystem as well as all of those other natural resource areas where medicinal plants are native.

Additionally, the inclusion of Indigenous Knowledge Systems into modern research could greatly enhance our understanding of ethnomedicinal uses of medicinal plants. Collaborative scientific research projects may lead to the development of new medicines based upon medicinal plants. International acceptance of the traditional medical practices used by indigenous people may also result from such collaborations.

Policy makers and government officials have an obligation to develop supportive policies and legal protection that allows for the protection of the intellectual property rights of indigenous peoples and does not allow non-tribal organizations to take advantage of the use of indigenous knowledge. As well, providing economic benefits to indigenous communities for the commercial use of their knowledge will help create the incentive needed for them to continue to contribute to society.

In addition to creating policy that supports the continued contributions of indigenous communities, promoting awareness and education among both indigenous communities and

the broader public about the importance of indigenous knowledge systems and the need to preserve biological diversity as well as promote awareness and education regarding the importance of preserving traditional medicine through educational programs are necessary.

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ENHANCING EDUCATIONAL OUTCOMES THROUGH ARTIFICIAL INTELLIGENCE: A STUDY ON DEVELOPING TEACHING-LEARNING SKILLS

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ABSTRACT

Artificial Intelligence (AI) has gained significant attraction in education, with many organizations using it to improve teaching and learning. This study explores how the integration of AI into various types of learning systems can support instructional and learning-related skills and positively impact educational outcomes. The methodology employed to conduct this research was a qualitative approach based on content analysis. The qualitative research methodology was used to explore the experiences of teachers and students with the implementation of AI, what challenges were associated with integrating AI into education, and what opportunities may be available because of AI integration. The data collected consisted of interviews, focus groups, and existing policy documents. This data was analyzed for themes that relate specifically to AI's impact on pedagogical practice and student engagement with learning. The results indicated that AI has the ability to provide personalized learning, automate some administrative tasks, and improve feedback channels; thus, creating a learner-centered, interactive environment. Several barriers for implementing AI in education were also identified, including a lack of technological literacy, ethical issues associated with AI, and inadequate infrastructure. Although the research concluded that in order to achieve effective improvements in instructional and learning skills through AI, educators must engage in successful collaborations with policymakers and technologists, be provided with proper professional development, training, and policy, and utilize sufficient infrastructure. The research emphasizes that the true potential for harnessing AI in education can only be realized through a collaborative effort between all stakeholders.

Keywords: Artificial Intelligence (AI), Education, Pedagogical Practice, Personalized Learning, Challenges, Collaboration.

BACKGROUND AND RATIONALE

There have been many advancements in AI over the past ten years. One area where we are seeing dramatic change in the way we interface with AI is in the many different ways that AI enables us to derive results in different industries (such as Healthcare, Financial Services, and especially Education). One of the main benefits of AI is its capacity to analyze very large amounts of data in order to provide customized resources for each student based on their educational needs. Traditional educational methods have long had significant difficulty providing students with personalized educational experiences (i.e., meeting the individual educational needs of students), but now with AI-enabled programs, we can provide

personalized learning (including, in many cases, the use of real-time feedback and the use of adaptive assessments).

Education has been transformed by artificial intelligence (AI) into a completely new way to enhance teaching and learning for everyone on the planet in a way that has never been possible before. Use of AI in education has the potential to address some of the greatest challenges that have existed for a long time, including personalized learning, effective instruction, and student engagement, which can lead to improved educational outcomes. AI systems can help create personalized learning experiences for students by customizing the content they learn based on their specific needs, learning pace, and Learning Style, which is something that traditional classroom teaching methods generally struggle to accomplish (Baker & Inventado, 2014). When students receive personalized instruction, they tend to have increased motivation and learn more thoroughly (Kumar et al., 2020). AI enables teachers to make decisions based on data because it provides immediate feedback on student performance, and allows them to make decisions based on data very quickly, so they can provide necessary interventions to students and be much more responsive in their teaching (Johnson & Lee, 2021). Intelligent tutoring systems (ITS) are one example of the way. AI will be able to provide an experience similar to one-on-one tutoring through the provision of immediate feedback and customized assistance to learners, which will help build up the skills and confidence of the learner (Woolf et al., 2018).

Integration of AI will provide the tools needed to help develop essential skills for the 21st century, including critical thinking, digital competence, and self-regulation through active, inquisitive learning (Li & Wang 2022). As a result of these advances, several of the challenges that exist are related to the ethics of using AI, privacy of data, and inequities of access due to digitally divided regions and communities, which must be addressed in order to ensure that all students can access AI tools and use them for their own benefit (Selwyn 2020). The need for teachers to develop their own teaching and learning strategies with the help of AI requires teachers to also develop new skills like digital competence and pedagogical strategies to be applied successfully when applying AI into their instructional practices (Zhao & Frank 2021). As the educational system continues to evolve, ongoing research has affirmed the importance of developing AI tools that supplement human teachers. Thus, enabling the development of a cooperative relationship whereby both human teachers and AI working together will enhance teacher performance and improve student outcomes (Luckin et al. 2016). Using AI to assist in developing teacher and learner skill formation holds great potential; successful application depends on the ethical application of AI, inclusiveness of policies, and support for ongoing teacher professional development, and in the end will result in an equitable and effective education system (OECD 2020).

SIGNIFICANCE OF THE STUDY

Although there are many possible ways to use AI in education, how AI technology is used is not the same way across different areas and types of (many) schools or colleges. Some

educators and learners may have some concerns about the ethical implications of AI on the work of educators, the type of data that will be used (e.g., personal data and private information) and general access to the current infrastructure to support AI use. This study looks at how AI might help to develop skills needed for teaching and learning, and therefore improve learning in schools and colleges. The perspectives of both the students and the educators will be collected to determine best practices and common challenges in the implementation of AI technology.

The importance of this research on improving educational results via artificial intelligence (AI) creates an opportunity to change how we approach education-related challenges by creating more personalized, productive and enjoyable educational opportunities through the application of AI technologies (Luckin et al., 2016). As AI continues to be used in education systems, these new educational technologies offer exciting opportunities to resolve some of the greatest challenges in education today, including student engagement, differentiated instruction, and the efficient use of educational resources (Luckin et al.). By using adaptive learning systems, intelligent tutoring systems, and data analytics (Baker et al., 2020) as AI-based supports for teachers, teachers can modify their instruction for each student's unique needs which may facilitate improved academic performance and reduce the achievement gap between students (Heffernan & Koedinger, 2014). The use of AI can provide immediate feedback and assessments to help teachers adjust their instructional methods quickly (Baker et al., 2020). The use of AI to develop teaching and learning skills will also result in greater digital literacy and critical thinking skills so students can interact successfully with an increasingly technologically proficient workforce (Holmes et al., 2019). This research demonstrates that to maximize the impact of integrating AI into education systems, it is critical to adopt an ethical and effective approach to the integration of AI into educational settings which will enable us to capitalize on the advantages and address potential drawbacks of AI (Cios & Zapala, 2020). It is essential that we understand the role of AI in enhancing educational outcomes to assist with creating innovative teaching strategies and to improve student success in the 21st century for policymakers, educators and all stakeholders. This research will also provide useful information for the strategic deployment of AI in education and assist with the creation of future-based teaching and learning environments that will be adaptive, inclusive and support diverse learners.

STATEMENT OF THE PROBLEM

Innovative technological tools in education, particularly with the use of artificial intelligence, are being developed; there is very little research evidence demonstrating the effect of AI may have on one's ability to create and learn teaching and learning skills. What barriers and enablers are there within the educational system that block or help one develop teaching and learning skills? This study will address those questions by exploring the ways in which AI is used to create both teacher competency and student engagement.

OBJECTIVES OF THE STUDY

- O₁** : To explore teachers' perceptions of AI tools in enhancing teaching skills.
- O₂** : To analyze students' experiences with AI-supported learning environments.
- O₃** : To Identify Opportunities & Challenges of Integrating AI in Education.
- O₄** : Evaluate How AI Affects Pedagogy and Education Outcomes.
- O₅** : Recommendations for Effective Implementation of AI in Education.

SCOPE AND LIMITATIONS

This paper explores forms of AI that institutions of higher education currently employ and/or are testing as part of their activities. The research includes qualitative perspectives from both educators and students, acknowledging that quantitative methods of measuring learning outcomes are outside the scope of this research. The limitations of this work include the potential for bias in participants' self-reported data, and the fact that different institutions utilize different types of AI tools.

STRUCTURE OF THE STUDY

The subsequent sections provide insights on how the existing body of literature addressed AI in education, methodological measures used to examine AI's impact within educational settings; data collected throughout the research process; results from the aforementioned research studies and their relationship (or lack thereof) to established expectations regarding the impact of AI on education and finally, potential implications of these findings for future research and practice.

REVIEW OF STUDIES

Table 1: Reviews

Reviews on...

Short Descriptions...

Introduction to AI in Education	In education, AI technologies are used in many ways, including Intelligent Tutoring Systems (ITS), automated grading, personalized learning platforms, and virtual assistants (Woolf, 2010). AI is viewed as having the ability to change traditional classrooms into dynamic places focused on students (Luckin et al., 2016).
AI-Driven Personalization and Adaptive Learning	AI has shown to be able to personalize the content of learning materials on a student-by-student basis through correlations from several studies. For example, adaptive learning systems (such as online tutoring systems) adapt difficulty based on a student's performance in real-time, leading to improved engagement and retention. Johnson and Adams (2020) reported that students motivated by their personalized AI tutor had increased levels of motivation.

Enhancement of Teaching Skills	AI-based technologies can assist educators in streamlining administrative duties, offering research based solutions for analyzing student performance, and creating differentiated instruction through AI-based analysis of student performance (Kerr, 2018). Utilizing analytical tools that utilize AI will allow educators to find students who have been identified as high-risk and make changes to their teaching strategies based on the results (Siemens & Long, 2011).
Challenges and Ethical Concerns	Although many advantages exist, research has indicated potential issues regarding associated risks to privacy, algorithmic discrimination, and the digital divide (Cabitza et al, 2017). Teachers face a common challenge of not having sufficient experience using AI-based technologies in education, and inadequate internet or technology infrastructure limit the extent of AI's implementation into schools (Selwyn, 2019).
Impact on Learning Outcomes	Research shows that using artificial intelligence to assist in teaching can improve test scores, boost critical thinking skills, and increase independence among students (Walkington, 2013). The research is still in an incomplete stage and is clearly dependent on each school's context, more implementation guidelines are necessary.

GAPS IDENTIFIED AFTER REVIEW LITERATURE

The existing research highlights the possibility of AI, but explores very little; therefore, the purpose for conducting a qualitative research study exploring teacher and learner life experiences related to AI has not previously been conducted. In order to fill this gap, I will use a qualitative content analysis to determine teachers' and learners' perspectives and practices regarding AI.

METHODOLOGY

The researcher has used a qualitative research methodology by using content analysis for the interpretation of text data obtained through interviews, focus group discussions, and a review of policy documents. The study participants were thirty (30) teachers and thirty (30) students currently using the AI-based tools in their classrooms from different types of educational institutions. The data were collected using semi-structured interviews and focus groups, as well as document reviews of institutional-level policy documents that addressed the use of artificial intelligence.

DATA ANALYSIS

Through the process of data collection through transcription, themes or patterns or categories of teaching-learning skills and AI integration are extracted through the use of an inductive content analysis technique called coding, which is composed of the steps of open coding, axial coding and selective coding.

1. Teachers' Perceptions of AI in Developing Teaching Skills

Based on the data analyses, teachers' perceptions about AI in terms of developing teaching effectiveness have both positive and negative attributes. Many educators believe that AI can change how teaching is done, take the load off of administrative duties, and allow students to receive individualized learning. Many school staff see AI as a solution for improving their teaching by using real-time feedback, flexibility in student learning, and data to influence teaching strategies. Staff often express excitement for the potential use of analytics to identify student learning deficits and target intervention with students to better meet their individual needs and to provide a more responsive teaching environment. Some staff value AI for being able to complete repetitive jobs such as grading and managing attendance so that they can spend more time being creative and engaging with their students. Even with all of these benefits to utilizing AI, a large number of teachers are worried about the use of AI in their teaching practice. The primary themes of these concerns for staff are based on reliability, data security, and ethical issues. Educators have concerns about the lack of contextual factors influencing AI and the fact that AI algorithms may contain bias, using AI may not be equitable and fair in the classroom.

Educators are increasingly anxious about their traditional teaching roles being displaced by the use of Artificial Intelligence. They fear AI will reduce their accountability to themselves and miss out on the human quality that is crucial for delivering effective teaching and providing mentorship. Many educators also feel uncertain about using AI tools because there is a lack of sufficient training and professional development opportunities for teachers to become adequately prepared to use those tools, which causes educators to lack the essential confidence or skill set required to be productive in an AI-based learning environment without proper training or instruction. The need for more comprehensive professional development programs that appropriately train teachers to use AI tools including showing them how to use AI tools is critical in helping develop a deeper understanding of AI technologies as well as addressing ethical, pedagogical and technical concerns associated with them. Interestingly, the data indicates that teachers' prior experiences with other types of technology have an effect on their perception of AI technology.

Table 2: Analyses by theme on Teachers' Perceptions of AI in Developing Teaching Skills

Themes	Findings
Enhanced Pedagogical Strategies	Teachers see AI as a resource that assists them in providing personalized instruction and assessment for students. Many see AI's use for automation of repetitive tasks as highly beneficial but feel that training will help them to use this technology to its fullest potential. There will also be concerns regarding the ethics of using AI in the classroom e.g., data privacy.
Increased Efficiency and Time-Saving	
Need for Professional Development	
Ethical and Privacy Concerns	

2. Students' Experiences with AI-Enhanced Learning Environments

Research into what students think about learning in an environment with added Artificial Intelligence (AI) has shown a wide variety of both positive and negative experiences. Students have stated that AI learning tools have improved their learning journey by providing a more personal, fun, and easier way to learn along with the ability to receive immediate and/or real-time feedback from the AI Tutor or Platform that they are using, this allows for the student to realize what they do not understand or the mistakes that they are making very quickly so that they can change their learning approach as needed. Having this immediate support offered by the AI tutor or platform could level the playing field when it comes to getting quality learning in large classroom situations where it is difficult for the instructor to provide one-on-one attention to every student. Students have had mixed responses to their experience with using these tools, with many students reporting that they encountered difficulties related to the reliability and accuracy of feedback from AI platforms, including the fact that it might be inaccurate or not available; therefore, these students were frustrated due to the lack of feedback either from the AI tool(s) or from another type of resource; this could create an inaccurate understanding of the subject matter.

Many students report feeling a loss of human interaction and emotional connection, which they see as important parts of good learning. The lack of nuanced understanding and empathy in AI systems leaves students feeling lonely and misunderstood, especially when dealing with complex or sensitive subject matter. Students' opinions are also affected by privacy and security concerns; many students are anxious about how much of their personal information is collected, how their personal information is shared, or used. Another important thing that is identified is that students vary in their levels of digital literacy, and this has an effect on how well they use AI technologies. Some students pick up AI quickly and use resources available through AI to add to their existing level of understanding and learning, whereas other students do not have similar skills and are frustrated trying to use these learning tools. Also, the way that AI tools have been created by companies affects how students experience using them. For example, when AI tools do not match their respective curriculums or lack of accommodations for different learning styles, then they tend to fail to meet students' expectations or needs. Even with obstacles, many learners recognize how AI can dramatically improve education if used appropriately. Students support an integrated approach, addressing the opportunity of combining student support via AI with mentor support, indicating that a blend of both support mechanisms would create the most successful learning experience possible through hybrid learning, utilizing technology with an element of human relationships.

Table 3: Analyses by theme on Students' Experiences with AI-Enhanced Learning Environments

Themes	Findings
Increased Engagement and Motivation	AI-powered platforms can support engagement in learning by allowing learners to become more self-directed in their educational journeys. There are a number of learners who struggle to navigate the new technology that has become so central to their educational experiences, highlighting the need for increased levels of digital literacy.
Customization of Learning Paths	
Challenges with Technological Literacy	
Feelings of Autonomy and Self-Regulation	

3. Opportunities & Challenges of Integrating AI in Education

The inclusion of AI into all sorts of industries provides a major opportunity for transforming how organizations operate by improving efficiency, decision-making, and innovation. While there are many barriers to successfully adopting AI and many facilitators that will help in the successful adoption of AI, the lack of technical expertise and the lack of skilled employees in an organization is one of the biggest barriers identified when trying to develop, implement and maintain AI within an organization. In many organizations, there is a gap in the necessary skills to successfully implement AI, evidenced by the shortage of data scientists, AI specialists and subject matter experts. Organizations have additional challenges with limited knowledge of AI and its capabilities and limitations, as well as the limited number of leaders and/or employees that have the knowledge or experience to adopt new technology solutions. Organizations often face barriers resulting from data-related issues; many organizations operate in data silos, and also have problems with low data quality and with the absence of sufficient data governance to enable effective and efficient methods of training AI models.

Concerns related to the ethics of data privacy or security create significant obstacles as increasing levels of regulatory scrutiny from regulators and the public put pressure on businesses to deploy new technologies while fearful that they are deploying technology that might reflect bias or result in discrimination against classes of individuals or misappropriate sensitive data. Therefore, the fear of data misuse, bias, or discrimination may slow down the pace of deployment of AI due to fears that using certain types of data or deploying AI solutions could result in negative public relations for an organization. The cost of AI development and deployment may create financial barriers to entry, especially in the case of small/medium-sized enterprises with limited budgets, as they may require substantial amounts of infrastructure, software/building costs, marketing costs, and cash to hire and train skilled talent/developers to develop AI solutions. Other barriers include organizational resistance/inertia (e.g., fear of job loss), entrenched organizational workflow, lack of confidence in AI, and the challenge of generational differences among management/employees, which may also lead to employee pushback against deploying certain kinds of AI. Technological barriers, including lack of scalable infrastructure, legacy systems, and limited ability to use different types of AI tools in conjunction with currently established IT infrastructure are also impediments to the seamless integration of AI. Other facilitators will support organizations in the use and integration of AI technologies. Leadership support and the strategic vision of key executives within organizations will likely support/enable efforts to use and integrate AI. Organizations with strong executive support and a clear strategic vision for their use of AI will be more likely to allocate the required resources to support innovation and to support change management related to their use of AI technologies. Organizations with strong organizational cultures that encourage experimentation, continuous learning, and openness to change will also be more likely to successfully adopt and integrate AI solutions.

There are many large barriers to the effective integration (or use) of AI, such as skills shortages, data issues, ethical concerns, costs, and organizational resistance; there are also many facilitative factors available to help organizations successfully implement AI.

Facilitative factors include commitment from leadership, supportive organizational culture; availability of data, favorable policy and procedure, strategic partnerships and technology improvements. By understanding the barriers and strengths (facilitators) needed for the successful adoption of AI will enable organizations to maximally leverage the transformational potential of AI; provide possible long-term growth; provide competitive advantage; and foster innovation in a continuously evolving digital environment.

Table 4: Analyses by theme on Opportunities & Challenges of Integrating AI in Education

Themes	Findings
Infrastructure and Resource Constraints	The absence of dependable infrastructure and little training hinder the adoption process. The integration process is aided by having good attitudes toward and supportive policy. The issue of ethics continues to require attention.
Teachers' Attitudes and Readiness	
Policy and Institutional Support	
Ethical and Privacy Frameworks	

4. AI Effects Pedagogy and Education Outcomes

Through analyzing student achievement data, educators can use data to plan for, monitor progress toward, and improve all student outcomes. The collection and analysis of achievement data and the application of resulting modifications to instructional delivery and student assessment has become part of ongoing efforts by schools to personalize instruction by meeting the unique needs of each student. Educators use a data-driven approach to enhance their instructional delivery methods and modify specific teaching strategies based on the results of achievement data collected in a real-time manner. A data-driven approach impacts instructional delivery, which also includes utilizing a variety of instructional delivery strategies, including differentiated instruction, ongoing formative assessments, and the use of adaptive learning technologies, to effectively meet the needs of all learners.

Through the analysis of data, patterns, and trends may be discovered that a teacher would not typically notice, it allows a teacher to uncover systemic problems such as curriculum gaps and student's understanding levels. With an improved understanding of student motivation, educators will develop a more intentional lesson planning process and allocate their resources in a way that aligns with their students' needs, thereby increasing their student's motivation for learning and interest in the subject matter. By utilizing data to create a culture of continuous improvement, the data on student performance can be used by educators as a means of encouraging reflective teaching practice and engaging in professional development based on evidence of their practice. As educators continue to evolve in the context of data, the impact of these changes can be seen in the outcomes of learning as demonstrated by increased student achievement, retention, and understanding of concepts. Studies show that when teachers use data-informed practices, students demonstrate greater improvement in their scores on standardized tests, critical thinking skills, and overall academic success.

Table 5: Analyses by theme on AI Effects Pedagogy and Education Outcomes

Themes	Findings
Shift towards Learner-Centered Approaches	Artificial Intelligence Shapes the Future of Teaching Practice by Creating Greater Interaction with Students, Personalization of Learning and Providing Data to Support Decision-Making.
Data-Informed Instruction	
Improved Feedback and Assessment	
Challenges in Maintaining Human Element	

5. Recommendations for Effective Implementation of AI in Education

A successful AI adoption strategy requires a thoughtful integration of the technical capabilities of the technology with the business objectives of the organization. To achieve this, executives must also be highly engaged in fostering a culture of innovation and change through providing sponsorship for AI initiatives within their organizations. Comprehensive data management practices should be of utmost importance to organizations, as they are critical to providing the high-quality, accessible data that will fuel AI models. Cross-functional collaboration between the information technology department, the data science department, and the business unit(s) is also critical in identifying use cases for AI that can deliver value to the organization. Organizations should invest in the development of talent and the upskilling of their employees to ensure they have the expertise necessary to successfully implement, support, and maintain their AI solutions. By using an interactive approach to testing, learning, and refining AI solutions throughout the life of the project and product, organizations can reduce their risk and optimize the outcomes of their AI initiative.

Table 6: Analyses by theme on Recommendations for Effective Implementation of AI in Education

Themes	Findings
Professional Development Programs	Teacher training, explicit policies, infrastructure funding, and engagement of a variety of stakeholders will all be necessary for effective integration.
Policy Frameworks and Ethical Guidelines	
Infrastructure Development	
Stakeholder Collaboration	

EDUCATIONAL IMPLICATIONS

The research we have conducted will have a serious effect on a wide range of stakeholders.

- **For Teachers** the recommendations for professional development to address this issue are critical to give them the necessary skills required to integrate AI tools into their educational programs using effective pedagogy as well as ongoing training to develop their confidence with new digital technologies.

- **For Policy Makers** having clear policies and ethical guidelines surrounding the use of AI will help to ensure that AI tools are used responsibly. Investment in digital infrastructure and initiatives to improve digital literacy can help reduce the digital divide.
- **For Educational Organizations** it is imperative that schools and colleges adopt a culture of innovation and support the testing and implementation of AI tools while adhering to ethical standards, as well as being human-centered in everything they do.
- **For Researchers** it is critical that continuing research is done to investigate how AI will impact all areas of education, so that best practices and effective policies are developed.
- For **Technology Developers** to create user-friendly and inclusive AI tools that are ethically designed and that will only help to meet pedagogically based learning goals will encourage greater usage and acceptance of those AI tools.

SUMMARY AND CONCLUSION

AI is poised to transform usual methods to enhance the teaching or learning process and consequently improve student learning outcomes. In this study AI provides qualitative insight into how AI will improve the personalization of each learner's learning experience as well as support teachers in the development of innovative teaching methodologies. Barriers such as required infrastructure, ethics, and lack of training limit the use of AI.

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SECONDARY EDUCATION IN THE CONTEXT OF NEP 2020: A THEORETICAL PERSPECTIVE WITH SPECIAL REFERENCE TO GOVERNANCE AND ADMINISTRATION

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ABSTRACT

The National Education Policy 2020 (NEP 2020) marks a significant change in India's educational policy after over three decades, with a focus on equity, inclusion, quality, institutional autonomy, accountability, and learner-centred educational development. Since secondary education lies at a key juncture as it forms the link between basic schooling and higher education and at the same time prepares students for continued education, employment, and becoming responsible citizens. In light of this, the current study critically looks at the governance and administrative changes proposed for secondary education under the NEP 2020 and investigates their impact on institutional effectiveness, the quality of education, and equity. Using a qualitative documentary research approach, the study is based mainly on the NEP 2020 and also makes use of other relevant official reports, and peer-reviewed academic literature. The documentary evidence was thematically analyzed from a critical interpretive point of view, with special focus on transparency, accountability, monitoring, and professional development. The analysis shows that the NEP 2020 aims to shift the governance of secondary education from a system that is mainly centralized and based on procedures to one that is more decentralized, participatory, flexible, transparent, and outcome-focused. However, considerable difficulties in implementation might result from differences in institutional capacity, financial and human resources, administrative readiness, professional autonomy, intergovernmental coordination, and monitoring systems. The study also contends that reform of governance should not be seen simply as an administrative reorganization but rather as a systemic approach to enhancing the quality of education, promoting inclusion and making institutions more responsive. By placing NEP 2020 within the wider context of Sustainable Development Goal 4, the study underscores the role of governance capacity in achieving inclusive and equitable quality secondary education in India. The results provide policy-relevant suggestions for improving institutional effectiveness and for ensuring the sustainable implementation of NEP 2020.

Keywords: NEP 2020, Secondary Education, Educational Governance, School Management, Policy Reform.

INTRODUCTION

The National Education Policy 2020 (NEP 2020) marks a major shift in the structure of India's education policy and is the first all-encompassing national education policy of the

21st century. It replaces the policy framework which had been in force since 1986, and suggests systematic changes in both school and higher education, with a special focus on equity, inclusion, quality, flexibility, multidisciplinary learning, institutional autonomy, and accountability. At the school level, the policy introduces a new curriculum and teaching approach, aims to improve learning outcomes, and promotes a more comprehensive, learner-centred, experiential and competency-based method of education. Within this wider transformation, secondary education occupies a particularly important role since it connects basic and preparatory learning with higher education, vocational routes, and involvement in social and economic life. Yet, the success of such large-scale educational reform depends not only on the quality of the policy itself but also on the effectiveness of the governance and administrative systems through which the policy is put into practice in institutions. Because of India's great geographical, demographic, socioeconomic and cultural diversity, there are large differences in educational infrastructure, financial resources, institutional capabilities, the availability of teachers, and the effectiveness of administration from one state or region to another. As a result, national education policies have in the past run into difficulties due to uneven institutional capacities, limitations in resources, the need for coordination between different levels of government, and the diversity of local educational situations.

NEP 2020 must therefore be looked at not just as a reform in curriculum or teaching methods but also as a governance reform that calls for major changes in administrative structures, institutional responsibilities, stakeholder involvement, transparency and accountability. Governance and administration are especially crucial in the case of secondary education since schools function in complex institutional settings that include governments, school authorities, teachers, students, parents, communities and regulatory organizations. Effective school governance requires a balance between institutional autonomy and public accountability, while administrative systems should help to improve education rather than become overly concerned with meeting procedural requirements. NEP 2020 stresses decentralization, institutional autonomy, transparency, accountability and participatory decision-making as key means of improving the operation of educational institutions. These principles have an impact on the way in which secondary schools are managed, monitored, evaluated and supported by educational authorities. Another aspect of good secondary school governance is the establishment of safe, inclusive and non-discriminatory learning environments. Adolescents may face various forms of vulnerability both inside and outside school, such as bullying, harassment, gender-based discrimination, body shaming, social exclusion and other kinds of physical or psychological intimidation. Governance mechanisms therefore cannot be limited to academic administration and financial management; they must also include student protection, safeguarding, mechanisms for redressing grievances, equality, dignity and participation. The administrative performance of schools should therefore be judged by their ability to protect learners' rights and well-being while making sure that all have equal access to meaningful educational opportunities. Transparency and institutional accountability are also vital elements of the governance reform under NEP 2020. Having access to reliable information about school infrastructure, enrolment numbers, the availability of teachers, academic performance, financial management, fees and the way the institution is running can strengthen public

accountability and enable evidence-based decision-making. Likewise, proper auditing, reporting, monitoring and disclosure procedures can increase trust in institutions and reduce the chances of administrative opacity. Digital platforms and publicly available educational databases can further promote transparency by allowing students, parents, communities, researchers and policymakers to obtain relevant information about the institutions. Nevertheless, transparency mechanisms must be supported by sufficient institutional capacity and responsible data governance so that the disclosure of information actually contributes to educational improvement rather than merely fulfilling a procedural obligation. The connection between educational administration and educational quality is therefore complex. Too much bureaucratic regulation, fragmented responsibilities, a heavy administrative workload and an excessive focus on compliance could possibly shift institutional attention away from teaching, learning, student development and innovation. On the other hand, well-designed governance structures can give schools more flexibility while still maintaining clear standards, monitoring systems and accountability. Since NEP 2020 places emphasis on institutional autonomy, professional development, school leadership, continuous assessment and decision-making based on evidence, it raises important questions about how administrative systems can be redesigned to support rather than hinder educational improvement. Even though there has been a great deal of discussion about NEP 2020, much of the scholarly attention has been given to curriculum restructuring, foundational literacy and numeracy, teacher education, vocational education and higher education, while the governance and administrative aspects of secondary education still need to be subject to more systematic theoretical analysis. In particular, there is a need to critically examine how decentralization, transparency, institutional accountability, administrative restructuring, stakeholder participation, student safety, professional capacity and performance evaluation interact within the implementation framework of NEP 2020. Such an examination is especially pertinent because the achievement of policy goals ultimately relies on the institutional and administrative ability to turn the policy principles into sustainable practices at the school level.

In this context, the present study carries out a theoretical and critical analysis of the governance and administration of secondary education in India in the light of NEP 2020. It aims to examine the main governance principles and administrative reforms proposed by the policy, to identify the major challenges that might affect their implementation, and to look at the implications these reforms have for institutional effectiveness, transparency, accountability, inclusion and educational quality.

OBJECTIVES OF THE STUDY

The study aims to achieve the following objectives:

- 1) To study the Governance and Administration of Secondary Education in the context of NEP 2020.
- 2) To point out the different ideas about improvement of Governance and Administration of Secondary Education in India in light of NEP 2020.

METHODOLOGY OF THE STUDY

This study uses a qualitative documentary research approach in order to carry out a critical examination of the governance and administrative aspects of secondary education in India in the light of the National Education Policy 2020 (NEP 2020). A qualitative method was regarded as suitable since the aim of the study is to gain a thorough and context-specific understanding of the policy provisions, the institutional arrangements, the principles of governance, the administrative reforms, and the challenges relating to the implementation of secondary education, rather than producing statistical data or testing causal links. The NEP 2020 is the main policy document upon which the analysis is based. Special attention was paid to the policy's aspects relating to educational governance, decentralization, institutional autonomy, transparency, accountability, school leadership, teacher professional development, assessment, inclusion, student safety, stakeholder participation, and administrative restructuring. In order to provide a contextualization and a critical interpretation of these provisions, the study also makes use of a variety of secondary documentary sources, such as policy documents issued by the Government of India, peer-reviewed journal articles, and scholarly books. The documentary data were gathered by systematically going through the relevant policy and scholarly materials and were then organized according to analytical themes that had been derived from the study's objectives. The analysis was carried out from a critical interpretive standpoint, taking into account the fact that the implementation of educational policy is influenced by institutional capacity, financial and human resources, administrative structures, intergovernmental coordination. Therefore, the study does not assume that the normative provisions of NEP 2020 will automatically lead to effective institutional practices. On the contrary, it critically looks at both the opportunities and the difficulties connected with carrying out the governance and administrative reforms proposed by the policy, with a focus on secondary education.

FINDINGS AND DISCUSSION

Safety and Rights of Students: School authorities should be more proactive and accountable towards their students in school. The school administration system should be developed and managed in such a way that special attention should be paid to their rights, safety, and various daily problems. Nowadays, the main problems that arise in secondary school are bullying, body shaming, sexual harassment, various types of discrimination and harassment related incidents, etc., among girls and adolescent pupils. All such incidents should be reported to school authorities. The school authorities can take necessary action that is effective, accessible, and well known to all students. All students should be adopted on a high-priority basis. Workshop or, training, or seminars should be arranged by the school administration on Indian laws regarding said incidents. Schools must be ensured to be safe, secure, and a pleasant place to learn.

School Governance and Management: Towards achieving sustainable development goals 4 (SDG 4), India's progress must ensure not only free but also equitable and quality primary and secondary education for all children. Schools must disclose, either offline or online, in the public domain their educational results, all financial, academic, and manage-

ment matters with transparency. The said issues should be given due importance. It has been said that proper coordination should be done in the evaluation of schools. All educational institutions will publish audit reports as non-profit organizations, adhering to the same standards. If there is any surplus money in the old financial year, it will be re-allocated to educational purposes in the new academic years. The governance of schools will also get better and become far more well-organised with school complexes/ clusters. First, the Directorate of School Education will develop an authority for the school complex/ cluster, which will act as a semi-autonomous unit. The District Education Officer (DEO) and the Block Education Officer (BEO) will cooperate primarily with each school complex/ cluster as a single unit and assist its work. Under this organization, schools will expand in strength, will be able to implement greater freedom, and will contribute towards making the complex more innovative and responsive.

School administrations need to recognize grassroots realities and place more emphasis on essential local needs. Without too much importance on physical and infrastructural areas, more emphasis should be placed on areas such as land in schools, using of Teaching-Learning material (TLM), classroom space and playgrounds in urban areas, etc. so that schools can make their own decisions based on local needs and constraints, the mandates will be made sufficiently flexible and consistent. The areas of support for standard setting or regulatory frameworks, school administration and governance issues will be discussed in detail to build on the education and experience gained over the past decade.

Transparency in Public and Private Schools: To ensure that public and private schools can provide quality education, the school's accreditation, assessment, and benchmarking process should be reviewed. Emphasis should be placed on making them publicly available online and offline. As a result, they will be inspired and encouraged by government schools without any hindrance. For the general public, schools and SSA websites show both public and private schools' data, like classroom strength, roll strength, teacher strength, teaching subjects, all types of school fees, and all types of evaluation reports of students, etc.

Performance Evaluation: In the field of education, especially at the school level, everyone (Teachers, Head teachers, officers, and Teaching staff, etc.) must work together as a team for the overall development of the education system. A uniform national performance evaluation system must be created to ensure the career advancement, promotion, and accountability of all individuals. All regulators will ensure that this huge undertaking is carried out systematically and honestly. They will be responsible for this work. The performance of every teacher, non-teaching staff member, and head teacher within the school system will be strictly evaluated. In order to ensure accountability of evaluation, the evaluation will be objective and development-oriented. This assessment must capture the student's results and progress.

State School Education System: The apex local body for the management of school education at the state level is the Department of School Education. They will provide overall oversight and set policies to manage the school education system. The school education department will not be directly involved in the rules, regulations, management and control of government schools. Instead, they will focus on proper improvement of schools.

The school education department will work independently to implement policies related to educational activities, rules, and regulations. The school education department, including the District Inspector's office and Sub-Inspector's office, will administer the operations, rules, and regulations for all public school systems in the state.

Academic matters, including the quality of education and curriculum in schools in the state, will be managed under the leadership of the SCERT in close consultation with NCERT. Through these activities, SCERT will become a revitalized organization. SCERT will conduct a 'change management process' to make organizations like CRC, BRC, DIET, etc. viable again. The SCERT will develop a School Quality Assessment and Accreditation Framework (SQAAC) through wide consultation with all stakeholders. Meanwhile, certification of competencies of pupils at the school-leaving stage will be handled by the Boards of Assessment/ Examination in each state.

Management and Control of the School Education System: Currently, the state's school education department or any of its branches manages all the major functions of the management and control of the school education system, namely the provision of public education, the regulation of educational institutions, and policy-making. This leads to conflicts of interest and excessive concentration of power. It is contrary to the proper management of the school system. The school education department often focuses too much on rules, regulations and other issues, which hinders the quality of education.

School Education Regulatory System: Above all, the goal of school governance should be to empower schools and teachers with confidence so that they can provide their excellence in the education system. This will result in improving educational outcomes for schools regularly. There will also be social and moral development among students. The school education regulatory system must ensure the integrity of the system by fully disclosing all financial procedures and student academic outcomes with complete transparency and public disclosure.

Continuous Professional Development (CPD): School principals/ head masters and school complex leaders will have similar modular leadership/ management workshop/ trainings and online development opportunities and platforms to continuously progress their own leadership and management skills, and so that they too may contribute to best practices with each other. Such leaders will also be expected to participate in 50 hours or more of CPD modules per year, covering leadership and management as well as content and pedagogy, with a focus on preparing and implementing pedagogy based on competency-based education.

School Complexes/ Clusters: The establishment of school complexes/ clusters and the sharing of resources across complexes will have a number of many benefits. The School Complex Management Committees (rather than simply School Management Committees) are healthier and enhance governance, monitoring, and administration by local stakeholders. Building such larger communities of schools, school leaders, teachers, students, supporting staff, parents, and local citizens would boost and strengthen the schooling system.

KEY FINDINGS

The findings of the study reveal that NEP-2020 introduces a comprehensive and multi-layered governance model that seeks to balance autonomy with accountability across all levels of education administration.

- NEP-2020 emphasizes the creation of a safe and inclusive learning environment. The study finds that school administrations must take proactive measures to prevent incidents of bullying, harassment, and discrimination. Workshops and awareness programmes related to students' rights and legal protections are essential for fostering a culture of respect and equity.
- The policy advocates for full transparency in institutional operations, including academic results, financial management, and administrative decisions. By making such information publicly accessible, schools can enhance credibility and public trust. This aligns closely with NEP-2020's commitment to governance that is participatory, data-driven, and ethically responsible.
- The study emphasizes the National Education Policy (NEP) focus on enabling schools and local authorities to implement context-specific decisions. Flexible governance structures facilitate adaptation to regional requirements, which is particularly significant in the context of India's diversity. The policy incorporates the principle that uniform solutions are not universally applicable in educational reform.
- Building on this foundation, continuous Professional Development (CPD) emerges as a cornerstone of educational reform. NEP-2020 mandates at least 50 hours of professional training annually for school leaders and teachers to enhance their pedagogical and management skills. This creates a system of lifelong learning and continuous improvement among educators.
- In addition to leadership development, the study identifies the establishment of school complexes and clusters as a critical innovation in governance. By pooling resources and fostering collaboration among neighbouring schools, this model promotes efficiency, peer learning, and shared accountability. It also strengthens local participation by involving communities, parents, and local authorities in school management.
- Completing this governance framework, the study emphasizes the importance of establishing uniform performance evaluation systems for teachers, administrators, and non-teaching staff. Transparent audit mechanisms will ensure that educational institutions function as non-profit entities and that surplus funds are reinvested in educational development.

CONCLUSION

The study now states that the National Education Policy of 2020 offers a major policy framework for changing the way secondary education is governed and administered in India. The policy's focus on decentralization, institutional autonomy, transparency, accountability, participatory decision-making, professional development, and evidence-informed administration shows a move away from the traditional, largely procedural and centralized methods towards a form of educational governance that is more responsive, inclusive, and oriented towards achieving outcomes. These principles are also generally in line with current views on educational leadership and with the obligations set out in Sustainable Development Goal 4.

Yet the extent to which the NEP 2020 can achieve transformation will ultimately depend on how well it is implemented at the institutional and local levels. Ongoing differences in the capacity of institutions, in terms of financial and human resources, administrative readiness, digital infrastructure, and intergovernmental co-ordination may lead to large variations in the results of the policy across different regions. For effective implementation, it is therefore necessary not only to ensure policy alignment but also to make continuous investments, to have capable educational leadership, to provide professional support for both teachers and administrators, to have transparent systems for monitoring, and to involve key stakeholders in a meaningful way.

Thus, the governance reforms should not be seen merely as a matter of administrative reorganization or meeting regulatory requirements. On the contrary, it should act as a means of improving teaching and learning, of safeguarding students' rights and well-being, of promoting equity and inclusion, and of enhancing institutional accountability. A well-coordinated and context-appropriate implementation strategy, backed by sufficient resources and involving continuous evaluation, is thus essential if the governance vision of NEP 2020 is to result in lasting improvements in secondary education. In this connection, enhancing governance capacity is a vital first step in moving towards more inclusive, equitable and quality education in India.

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WOMEN EMPOWERMENT THROUGH POLITICAL PARTICIPATION IN RURAL WEST BENGAL: DOES POLITICAL PARTICIPATION MAKE A DIFFERENCE ?

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ABSTRACT

This article is based on an empirical study that attempts to explore Rural Women's perception of their Political Participation, their views towards participation in active politics or local Self-government, their family perception in relation to support them in participation in politics, and the challenges of the rural women facing to join active politics. To get a deeper understanding of Women's Empowerment through political participation in rural West Bengal, this study is based on Qualitative research approach. The qualitative- phenomenological research method is adopted by the researchers to conduct the study. The semi-structured interview schedule was employed to gather the necessary data for this study. According to the data collected through interviews, the study found that young women are the more politically involved members. Some rural women believe political involvement empowers them, with few respondents believing that women have no place in active politics and that political matters belong only for Men, and some respondents said they were unsure if women's political participation would empower them or not, demonstrating a lack of social and political awareness.

Keywords: Women's Empowerment, Political Participation, Rural Women, Social Identification.

INTRODUCTION

A democratic system is characterized by political engagement. Democracy's efficacy is based on how well all of its citizens can participate equally and effectively. The democratic fabric is strengthened by citizens' active participation in politics. Given that women appear to be under-represented in Indian politics, it is imperative to raise women's awareness of their rights and encourage them to engage in mainstream politics. Given that women make up almost half of India's population, they deserve appropriate consideration and a fair role in the political system. It is widely acknowledged that a nation's ability to thrive sustainably depends on gender equality and the empowerment of women. Indian women possessed an equal status in society during the ancient era.

To support them and strive towards their improvement, they were granted the same platform as males. Their lives were independent of anyone else. They engaged in political, social, and educational activities. As time went on, however, the barriers placed on women by society and the family caused their status to deteriorate and their political participation to

cease. Women began to participate in the struggle to free themselves from British rule during the twentieth-century freedom movements led by numerous well-known freedom fighters and leaders (Mujahid et al. 2015, Pp. 39). This was because they realized that many people, both men and women, needed to unite and demonstrate strength in order to achieve freedom.

Women began participating in the process and even making significant decisions with this mentality. Women were given the confidence to leave their homes at that time due to the favorable social conditions in which they lived. They saw that women needed to break free from the societal constraints they had been enduring for a long time before they could aid in the liberation of our nation from its tyrants. The leaders of the time held the view that women ought to be more visible in politics (Kafilat, 2004,p. 68).

WOMEN EMPOWERMENT

Women empowerment refers to the process of enabling women to have control over their own lives and make decisions that affect them. It involves promoting equal rights, opportunities, and access to resources, allowing women to participate fully in social, economic, political, and cultural spheres. Empowerment can include education, financial independence, leadership roles, and challenging societal norms that restrict women's rights and freedoms'. Ultimately, it aims to create a society where women can thrive and contribute to their communities on an equal footing with men. Women's socio-economic and political statuses were restructured as a result of the freedom movement in our country. After the time of independence, women's standing began to decline once more. The women's section came to be dominated by Men's. Their freedom to engage in political, social, economic, and educational activities was curtailed. They were viewed as unworthy of taking part in the rebuilding of the powerful, independent India (Hossain, 2015,p. 170).

As a result, a large number of organizations dedicated to women have emerged to challenge the patriarchy and male preferences that currently exist. These groups have taken into consideration a wide range of issues, including violence against women, educational opportunities, women's participation in political decision-making, improved health facilities, etc., and their efforts have proven somewhat successful. Many female political figures came out to engage in politics and even had noteworthy journeys that inspired other women to break through boundaries and discover their own potential.

The status of women has improved as a result of numerous government plans and initiatives, as well as numerous NGOs and Self-Help Groups (Annakili, 2019, p. 26). The percentage of literate women has increased. The family began to invest in the girl child's education. The government has built a large number of schools and colleges specifically for Female's, and it has offered incentives to families who choose to send their daughters to these institutions. Women began to work, earning money for their daily needs and even taking care of their families financially. There have been numerous women's movements in India, and women have made progress in all spheres of life, but it has still a long way to go to achieve gender equality and women empowerment.

POLITICAL PARTICIPATION

Political participation is a crucial aspect of women's empowerment, as it ensures that women have a voice in decision-making processes and governance structures. When women are politically active and represented, it leads to more inclusive and equitable policies that address the needs and rights of all citizens, including women and marginalized groups.

THEORETICAL FRAMEWORK

The present study supported to Feminist theory which examines gender inequality, highlighting societal structures that perpetuate oppression. It critiques patriarchal norms, advocating for equality and inclusion across genders. Rooted in diverse perspectives, it spans liberal, radical, and intersectional feminism, addressing issues like power, representation, and identity (Tong, 2013). Political efficacy refers to individuals' belief in their ability to influence political processes and trust in government responsiveness. It encompasses internal efficacy (confidence in understanding politics) and external efficacy (perceived government responsiveness to citizens' concerns) (Campbell et al., 1954). It is crucial for democratic engagement and political participation. Social inclusion theory emphasizes equal opportunities for all individuals to participate fully in societal, economic, and cultural life. It seeks to address exclusion caused by systemic barriers, fostering equity, respect, and belonging. The theory underpins policies aimed at reducing marginalization and enhancing community cohesion (Rawal, 2008). Human capital theory posits that individuals' skills, knowledge, and abilities, gained through education and training, are key drivers of economic productivity and growth. Investments in human capital enhance individual earning potential and societal development, emphasizing education's role in workforce competitiveness (Becker, 1964).

SIGNIFICANCE OF THE STUDY

Political considerations are not given enough weight towards women's empowerment. Women's leadership and political participation remain less in India even after such advancements. Women are still excluded from political spheres for a variety of reasons, including discriminatory laws, gender stereotypes, social norms, poverty, lack of information, lack of education, and difficulty accessing health care. Consequently, it is critical to empower women, particularly in the political sphere, to eradicate such problems. Women will have more opportunities when they are empowered politically (Mal et al. 2014, p. 3). The lack of chances that women face worldwide makes them a global issue in terms of empowerment. Women lag substantially behind men in all areas of life, including education, careers, the system of decision-making, and society at large. The disparity is significant and the poor and developing nations have a large gap. Women's empowerment across all societal fronts is the sole tool capable of closing the gap and reducing the differences.

In the case of women, empowerment is vital, but it may also be utilized to elevate the other half of society (Alhasan, 2022, p. 114). The concept of empowerment has several facets. When both sexes receive the appropriate education, it may occur. They pick up on their surroundings. Education opens people's minds and inspires them to think outside the box. Women play a variety of roles in society, and these roles shift over time. Women have faced

both deprivation and motivation throughout history, from the ancient Vedic culture to contemporary civilization (Bandyopadhyay, 1999, p. 881). Rather than being a static state, 'women's empowerment' should be viewed as a process that upends stereotypes about power and encourages women to succeed.

The struggles faced by the male residents of this globalized community are considered. Even though they are under-represented in many fields these days, women have overcome barriers to claim their own space in several niches. Women have always been forced into the private realm by the patriarchal culture. Women's have accepted the fact that they don't have a voice of their own without raising any issues. Women are bringing up the next generation of torchbearers and leaders, but she is disguised as invisible herself.

From the perspective of political engagement, women are underinformed (Arowolo & Aluko, 2010, p. 583). They are not very informed about current political events. Local governments have established a one-third reservation for women, but in practice, very few of them are qualified for the role. Throughout the post-independence era, women actively participated in a number of movements. The well-known Chipko revolution that took place in Uttarakhand introduced the leadership traits that women display and their connection to nature (Mahapatra, 2017, p. 191). It is widely believed that women's involvement in politics is crucial for the advancement of society as well as for women personally. Only when women are employed in diverse fields and their struggles are acknowledged will the world move forward. One such area is political engagement. One of the obstacles to women's empowerment is a lack of appropriate education.

Having political empowerment is also crucial for women leaders to rise to the top and make decisions that benefit other women. (Mohapatra, 2017, p. 192) found that Indigenous women believe they are on par with Men. Tribal women have the autonomy to select their life partner, participate in all aspects of agriculture, have access to finance and savings, and manage businesses and income-producing land. There is patriarchy in the context of political empowerment. Women have benefited from the passage of the Panchayati Raj Act. of 1992. (Parvin & Sarkar, 2021, p. 71) the survey discovered that women are visible in local and national politics today, in comparison to the past. Even with the low rate, at least there has been a noticeable improvement.

There are several reasons why women participate in politics at a lower rate than men, including domestic constraints, sociocultural standards, lack of political expertise, and many more. Additionally, the article explores that when more women enter the political sphere, the conversation in society will naturally shift, and more women will be encouraged to enter politics by role models. Gender equality can be achieved by addressing women's difficulties. (Kafilat, 2004, p. 67) the study found that women in Nigeria are politically disempowered. Nigerian women led busy lives both before and throughout the colonial era, but today's women are exploited and mistreated. Cultural obstacles, time constraints, political violence, low socio-economic status, and other issues prevent women from participating in politics.

This article also outlines the measures for women's empowerment. Women's quotas, equal representation for men and women, education-based empowerment, the elimination of

prejudice, and many more topics are covered. So, the article believes that political engagement and education are the keys to achieving women's empowerment. (Mujahid et al.2015, p. 40) the study found that the primary school enrolment rate has increased over time, which has had a favorable impact on the employment market, according to the study's findings. Because of the increased unemployment rate, women have less economic advantage.

Although women have political rights, patriarchy nevertheless holds a stronghold. In parliament, there is gender equality with a 50 percent reserve. Consequently, women's representation has grown over time. (Alhasan, 2022, p. 116) the study found that women in Ghana encounter numerous cultural obstacles when attempting to participate in active politics. The national government and local governments put strategies and policies into place to help women get past these obstacles. The research also shows that women's political knowledge rose along with their engagement in Ghana as a result of the government's successful implementation of programs.

RESEARCH OBJECTIVES

From the review of the literature on the study's problem, it was discovered that research had been done both domestically in India and internationally on women's political engagement and associated topics. Nonetheless, there aren't many studies on women's perceptions of their political participation, particularly in rural regions of 'Pundibari Gram Panchayet, Cooch Behar-II Block, Cooch Behar Sadar Subdivision under the Cooch Behar District of West Bengal', and there are still unaddressed research problems. The researchers formulated the research objectives for conducted the study-

1. To study the perception of rural women towards their political participation.
2. To study about their views towards participation in active politics or local Self-government.
3. To study about their family perception in relation to support them in participating political activities.
4. To study about the challenges of the rural women facing to join active politics.

RESEARCH QUESTIONS

Based on the 'Objectives of the study', the researcher formulated the following research questions, in order to carry out the study. The research questions of the study are enumerated below-

1. What are the perceptions of Rural Women towards their political participation?
2. What are the views of rural women towards participation in active politics or local Self-government?
3. What kind of family perceptions are existing in society about supporting them in participating political activities?
4. What type of challenges facing by the rural women to join active politics?

METHODOLOGY OF THE STUDY

The goal of this empirical study is to explore rural women's participation in politics, the difficulties they face in joining politics, and their potential for general empowerment. As a result, this study is Qualitative and Phenomenological in nature (Creswell & Poth, 2018.P. 78). The study area was located in Pundibari Gram Panchayet within the Cooch Behar-II Block, under the Cooch Behar Sadar subdivision of the Cooch Behar district. A total of 30 purposive samples were collected from the Pundibari villages (Sajherpar Ghoramara-10 Sample + Bahannoghor Koloni-10 Sample + Taltala-10 Sample = 30 Samples) under the Panchayat area in Cooch Behar-IIBlock, Cooch Behar Sadar Subdivision of Coochbehar district. The sample criteria of the study were rural women who are over the age of 21, and who had completed at least the 10th standard educational qualification, through the process of purposive criterion sample (Creswell& Poth, 2018.P. 158).



Figure 01: Sajherpar Ghoramara, Bahannoghor Koloni & Taltala Villages under Pundibari Gram Panchayet within the Cooch Behar-II Block in Cooch Behar District Map.

(Source: <https://www.mapsofindia.com/maps/westbengal/districts/cooch-behar-district-map.jpg>
Retrieved on 20.3.2026)

DATA COLLECTION

The data was collected through Interviews, and the interviews were conducted by the researchers going to the respondents' residences. the researchers took permission from the head of the family before starting the interview session. Data were collected from 12th February to 15th February, 2026. An open-ended, Semi-structured interview schedule was employed for the study, a total of 15 questions were employed to fulfill the research objectives of the study. The interviewer asks the required questions to the interviewee as planned according to the Semi-structured interview schedule, and the interviewee can freely express her feelings, emotions, and problems and reveal her innermost thoughts without feeling constrained by the format of the program. In order to allow the interviewee to open up freely,

family members or guardians were not permitted to attend within the time of the interview process. During the process of the interview, the researchers recorded the full interview session with permission from the interviewee, and the audio recording was later transcribed by the researchers. The interview session began in the middle time of the day, in the time of afternoon, because that is when women would have more time to themselves after work. After the collected data, the data were analyzed thematically under four themes, the data were deductively coded under four themes because the themes were predetermined based on the study's objectives (Creswell & Poth, 2018. p-201).

DATA ANALYSIS AND INTERPRETATION

A. Demographic Information: The demographic information is collected and analyzed by the researchers using the following four tables.

Table 01: Distribution of respondents by Age.

Age of Women Respondents	Number of Respondents
21-25	5
26-31	7
32-37	7
38-43	6
44-49	5
Total	30

Table 01 shows the distribution of the sample of respondents by age. 5 of the women responders who responded to the survey are between the ages of 21 to 25, 7 responders are between the ages of 26 to 31, 7 responders are between the ages of 32 to 37, 6 responders are between the ages of 38 to 43, and the remaining 5 responders are between the ages of 44 to 49. So, young women make up most of the politically involved female members (26-31 and 32-37 years age group).

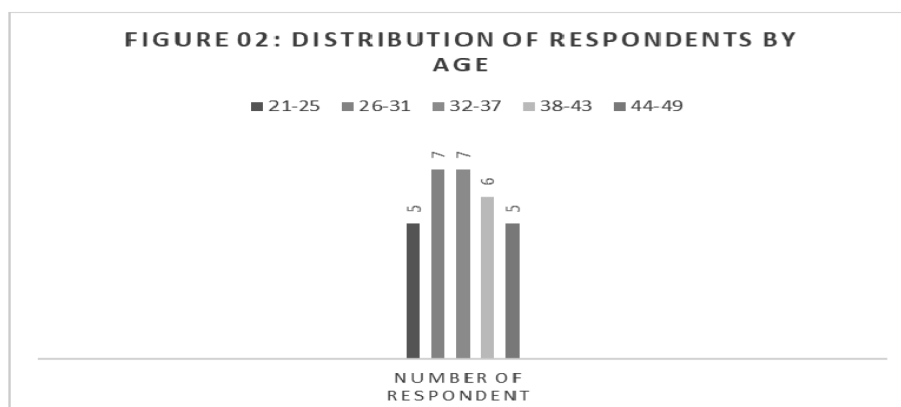
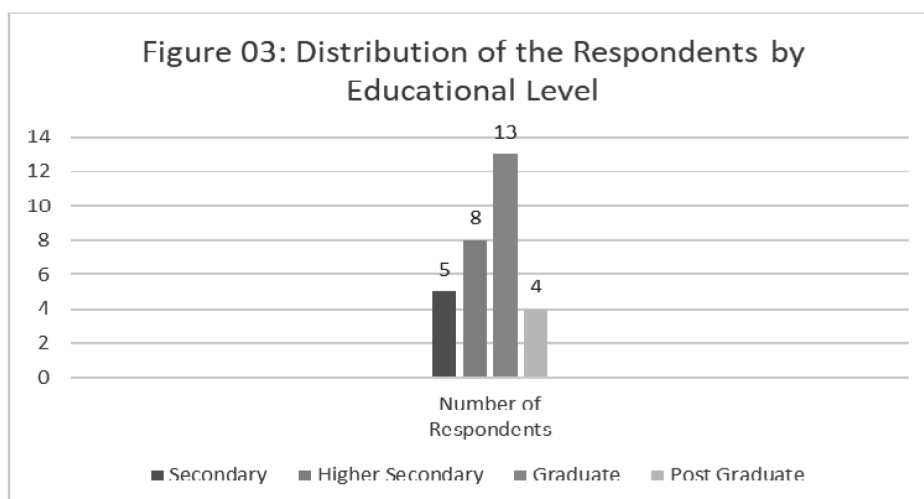


Figure 02: Distribution of Respondents by Age

Table 02: Distribution of the Respondents by Educational Level.

Educational Qualification	Number of Respondents
Secondary	5
Higher Secondary	8
Graduate	13
Post Graduate	4
Total	30

Table 02 Shows the distribution of the sample of respondents by educational level. According to the survey, there are 5 samples in the Secondary grades, 8 are in the Higher Secondary grades, 13 are in the Graduation grades, and 4 have earned a Master's degree. Most politically involved women members completed their Graduation (13 respondents).

**Figure 03: Distribution of the Respondents by Educational Level****Table 03. Distribution of the Respondents by Marital Status.**

Marital Profile of the Respondents	Number of Respondents
Married	24
Unmarried	4
Widow	1
Divorce	1
Total	30

Table 03 shows the distribution of sample respondents by marital status. 24 respondents are Married, 4 respondents are Unmarried, 1 respondent is found to be a Widow,

and 1 respondent is Divorced. The survey discovered that married people made up the majority of the sample respondents (24 respondents).

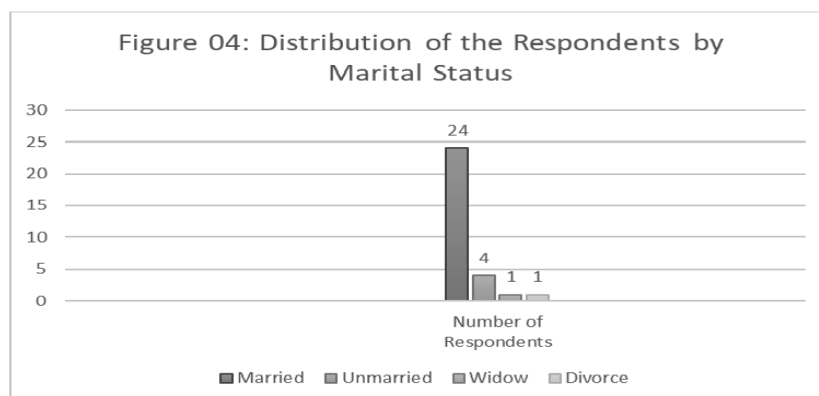


Figure 04: Distribution of the Respondents by Marital Status

Table 04. Distribution of the Respondents by Occupation.

Occupation of the Respondent	Number of Respondent
Self-Employed	18
Agriculture	4
parents Occupation	5
Service	3
Total	30

Table 04 shows the distribution of respondents by occupation is seen in- 18 respondents are found to be Self-employed, followed by 4 respondents who work in Agriculture, 5 respondents who work in their Parents' occupations, and 3 respondents who work in various Government or Private services. As a result, the majority of responders are self-employed (18 respondents).

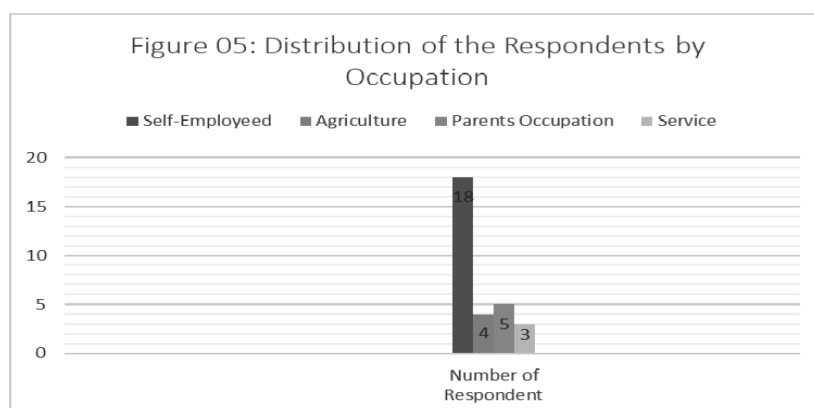


Figure 05: Distribution of the Respondents by Occupation

B. Thematic Analysis of the Data

Research Question-1: What are the perceptions of Rural Women towards their political participation?

‘The perceptions of rural women towards their political participation’ constitute a significant area of inquiry within the broader discourse of gender, democracy, and inclusive governance. Political participation is not merely confined to voting during elections; rather, it encompasses a wide range of activities such as contesting elections, engaging in local governance, participating in political discussions, attending community meetings, influencing decision-making processes, and advocating for community development. The way rural women perceive their role in these political processes profoundly shapes the extent and effectiveness of their participation.

The ‘perception of rural women regarding their political participation’ was examined under the first theme. According to the data gathered from semi-structured Open-ended interviews (19 respondents), rural women believe that to empower themselves, women should be at the forefront of politics. In their view, a political platform may be used to empower women and close the social divide that exists between them and Males. Women who enter politics have the opportunity to speak up and participate in the formulation of women’s policies. The perception of women’s involvement in politics is also negative, with 5 respondents believing that

‘Women are not suitable for active politics and that political matters are made only for Men’ (Respondent no. 6, age- 29, Bahannoghor Koloni, Pundibari Gram Panchayet).

In another side the number of 6 respondents said they were unsure if women’s political participation would empower them or not, demonstrating a lack of social and political awareness. Women’s opinions on the matter are rather varied, despite the majority of them believing that women’s involvement in politics will empower them.

Research Question-2: What are the views of rural women towards participation in active politics or local Self-government?

The views of rural women towards participation in active politics and local self-government represent a critical dimension of democratic inclusion and gender-responsive governance. These views reflect women’s perceptions, beliefs, attitudes, and experiences regarding their involvement in political processes, leadership roles, and decision-making institutions at the grassroots level. In the contemporary rural context, many women perceive participation in active politics and local self-government as an important instrument for social transformation and community development. They increasingly recognize political engagement as a means to articulate local needs, address socio-economic challenges, and influence developmental policies that directly affect their lives. For a significant section of rural women, political participation is viewed not merely as a constitutional right but as a pathway to empowerment, social recognition, and collective progress.

There are 12 respondents out of the 30 respondents who indicated that they would like

to engage in active politics if given a chance, according to the researchers' investigation number of 18 respondents desire to participate in politics. The female respondents believed that women should engage in active politics to empower themselves, while few of the respondents said they had no opinion about active political involvement or local self-government. These findings were noted by the researchers. When asked if they personally participate in politics, the respondents gave a positive answer, suggesting that while.

'They are eager to engage in active politics, they are unsure if political engagement will empower women' (Respondent no. 13, age 36, Sajherpar Ghoramara, Pundibari Gram Panchayet).

Women with greater access to education, information, and civic knowledge tend to view political participation more positively. They often perceive active involvement in politics as an opportunity to advocate for issues such as education, health, livelihood security, gender equality, and social justice. Conversely, women with limited exposure to political information may regard politics as a complex and inaccessible field dominated by influential individuals and established power structures.

Research Question-3: What kind of family perceptions are existing in society about supporting them in participating political activities?

'Family perceptions regarding women's participation in political activities' constitute a significant socio-cultural determinant influencing the nature and extent of women's political engagement. These perceptions encompass the attitudes, beliefs, expectations, and value orientations held by family members towards women's involvement in political processes, leadership roles, electoral activities, and decision-making institutions. As the family serves as the primary socializing agency within society, its perceptions often shape women's opportunities, motivations, and confidence to participate actively in political affairs.

The findings of the study indicate that 16 respondents out of the 30 respondents gave a positive response, the language of a respondent-

'Males in the community are open to women participating actively in politics and are tolerant of their female family members doing so', (Respondent no. 18, age 30, Bahannoghori Kolloni, Pundibari Gram Panchayet).

The number of 14 Rural women respondents reported that their husbands, in addition to their family members, do not like them to be involved in politics or political matters, and they have a negative opinion about this, as the Guardian notes that there are many other reasons behind this. If the women of the house are involved in politics, it may create various obstacles and various problems from the outside in addition to their family problems.

Research Question 4: What type of challenges facing by the rural women to join active politics?

Despite constitutional guarantees, affirmative policies, and increasing political awareness, rural women continue to encounter numerous challenges that restrict their entry into active political life. These challenges are multidimensional in nature, emerging from the

intersection of socio-cultural, economic, educational, institutional, and psychological factors. Understanding these barriers is crucial for examining the gap between formal political inclusion and substantive political empowerment.

Performing household chores is a common challenge faced by rural women who are politically engaged. This is because, in Indian society, particularly in rural areas, caring for children and household duties falls exclusively on women. Moreover, the most of respondents of 'the women also positively expressed-

'it as a challenge to attend the sudden situational calls as a public representative, which is a common phenomenon in Indian rural politics. The people of the society want their political leader to be at their side every now and then. It is difficult for women to leave the home suddenly, especially at odd hours' (Respondent no. 25, age 35, Taltala, Pundibari Gram Panchayet).

When the researchers asked the participants if they wanted to be actively involved in politics, a number of 9 respondents out of the 30 respondents gave a negative response. The study was to determine if the respondents' family members would allow them to get involved in the active politics that they want to join.

FINDINGS OF THE STUDY

The present study tried to describe and analyse the women empowerment through political participation in Rural West Bengal. In this regard, the researcher selected the samples from different areas of the selected district. After analysis of data, the researcher found that:

- The study discovered that there are number of 5 women responders who responded to the survey are between the ages of 21 to 25, number of 7 responders are between the ages of 26 to 31, number of 7 responders are between the ages of 32 to 37, number of 6 responders are between the ages of 38 to 43, and the remaining 5 responders are between the ages of 44 to 49.
- There are 5 samples in the Secondary grades, 8 are in the Higher Secondary grades, 13 are in the Graduation grades, and 4 have earned a Master's degree.
- The study found that there are 24 respondents are Married, 4 respondents are Unmarried, 1 respondent is found to be a Widow, and 1 respondent is Divorced.
- The study found that 18 respondents are found to be Self-employed, followed by 4 respondents who work in Agriculture, number of 5 respondents who work in their Parents' occupations, and remain 3 respondents who work in various Government or Private services.
- There are 14 of rural women respondents reported that their husbands, in addition to their family members, do not like them to be involved in politics or political matters, and they have a negative opinion about this, as the Guardian notes that there are many other reasons behind this.

CONCLUSION

The paper argued that empowering women can have a good impact on men's lives as well as women's, and naturally, that of children. Political parties are unable to ignore the 586.5 million women who make up roughly 48.46 percent of the electorate and the population (MHA, 2011). The findings of the present study are in conformity with those (Annakili, 2019), (Hossain, 2015), (Mahapatra, 2017) & (Parvin & Sarkar, 2021) despite the fact that nearly all political parties have made an effort to create women's organizations in an effort to win their support and expand the scope of their organizations. 'In order to lay the groundwork for women's political engagement, it is imperative that all political parties nominate at least one-third of female candidates in their organizations'. Men and women have equal rights and are the nation's lawful citizens. Women are abused both within and outside the house, despite the country's constitution declaring that they have the same status as males. Even now, gender equality in the political sphere remains elusive. As a result, every trend suggests that women's representation in politics needs to be given particular thought and cannot be left up to the forces that currently control our political parties and administration. Even the most talented female lawmakers feel marginalized and helpless in their own parties these days. Within their own political groups, the few women in leadership roles are an ineffectual minority and have not been able to inspire more women to enter electoral and party politics. Thus, it is imperative that we take specific action to increase women's political involvement so that they can have a greater say in decisions made at all societal and political levels. The study was conducted only in Pundibari Gram Panchayet within the 'Cooch Behar-II Block, under the Cooch Behar Sadar subdivision of the Cooch Behar district under West Bengal'. To conduct the study, the researchers only 30 'purposive samples' collected from the Pundibari villages under the Panchayat area in the Cooch Behar-II Block. The researchers at the end of the study explored that there is still a lack of unexplored research areas in which other researchers can study, the following areas- The Pundibari gram panchayet under the Coochbehar-II block of the Coochbehar Sadar sub-division under the Cooch Behar district was the study's location. It is also possible to conduct this study in other states and districts. Only Rural women participated in the present study, but it can also be done in Urban areas. The present study is conducted with only four dimensions, but in future studies, other dimensions (Leadership, Management, Decision making at home and in society) can also be studied.

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ICT-INTEGRATED INQUIRY LEARNING IN HIGHER SECONDARY LEVEL GEOGRAPHY: AN EXPERIMENTAL STUDY

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ABSTRACT

The teaching of geography at the higher secondary level in India, especially under the Council of the Indian School Certificate Examinations (CISCE) board, tends to focus on the orthodox didactic approach, which limits students to meaningful interaction with multifaceted oceanographic concepts like how ocean temperature, salinity, and density relate to each other. Based on constructivist learning theory, Technology Acceptance Model (TAM) and the Inquiry Training Model (ITM) of Suchman (1962), this is an experimental-research that explores the effectiveness of ICT-enhanced inquiry learning in Class 11 Physical Geography. A pre-test/post-test parallel-group design was used and 90 Class 11 students with three English medium schools in Ahmedabad, Gujarat were randomly allocated to three groups: ICT-Integrated ITM (n=30), Traditional ITM (n=30), and Conventional Instruction (n=30). According to the Indian schools, ICT tools were contextual and contained TDS/salinity meters, OLABS virtual simulations (MHRD-funded), Google Classroom, DIKSHA, Google Sheets to graph and Canva to create digital portfolios. Group A (ICT-ITM) had a much higher conceptual understanding (mean=76.8, SD=5.9) than Group B (mean=68.4, SD=7.8) and Group C (mean=59.2, SD=9.1). One-way ANOVA: $F(2,87)=52.34$, $p<0.001$, $\eta^2=0.55$ (large effect). Cohen's d for A vs. C = 2.18. The significant gains were observed in all the dimensions of the DigComp 2.1. ICT-enhanced ITM is a scalable, India-relevant pedagogical framework to deliver oceanographic processes in senior secondary geography, in line with NEP 2020, CISCE board curriculum standards, and UNESCO SDG 4.

Keywords: ICT-integrated inquiry, Inquiry Training Model, Oceanographic Concepts, Digital Competencies, Constructivist Learning.

INTRODUCTION

Geography at the higher secondary level (Classes 11 and 12) in Indian schools that follow the CISCE board, demands students to study complex processes in the earth system, especially those that involve more than two interrelated variables. Ocean temperature, salinity and density are the interrelationships of the three topics that are one of the core issues in the

Principles of Physical Geography paper. Students should also know how these three parameters of the ocean rely on each other and how these systems in turn affect the thermohaline circulation and global climatic systems, which are well defined in the CISCE board Class 11 geography syllabus (CISCE, 2023). Nonetheless, anecdotal data collected among teachers in Gujarat indicate that the subject is generally taught by reading the textbook and using the chalkboard, thereby not allowing the conceptualisation of abstract phenomena occurring in the oceans. Drawing upon constructivist learning theory, the Technology Acceptance Model (TAM) and Suchman's (1962) Inquiry Training Model (ITM), this experiment aims to test the effectiveness of ICT-integrated inquiry learning in Class 11 Physical Geography. Suchman's (1962) Inquiry Training Model has 5 steps-confrontation with the problem, data gathering and verification, experimentation, organizing and formulating explanations, and analysis of the inquiry process. Rooted in Vygotsky's (1978) Zone of Proximal Development and Piagetian constructivism, ITM treats students as active investigators who discover scientific principles. This is applicable to physical geography in which phenomena such as varying ocean temperature, concentration of salt and densities are observable. Davis's (1989) Technology Acceptance Model (TAM) complements ITM by considering that the perceived ease of use and perceived usefulness determine whether students will adopt and use technology. TAM suggests that tools that are government-endorsed, free of cost and available in regional languages would be accepted more easily by Indian students, so OLabs and DIKSHA have been chosen. However, Ellis, D. J. (2024) also caution that technology itself will not help students improve their learning; it has to be incorporated effectively with pedagogical approaches. ITM has the potential to do just that. Information and Communication Technology (ICT) tools that can be used for a Class 11 Geography lesson in India, include affordable TDS/salinity meters (Rs. 300 to Rs. 800) available on e-commerce websites in India, the MHRD-backed OLabs virtual science and geography lab, PhET Interactive Simulations (PhET Interactive Simulations, 2023) which provide freely accessible virtual experiments applicable to physical geography phenomena, the MHRD's DIKSHA portal, and cloud-based tools for collaboration such as Google Classroom and for graphical representation such as Google Sheets, while Google Sites and Canva can be used to create digital portfolios. This experimental study tests whether the ICT-integrated ITM, using these low-cost, government-funded digital tools widely available in India, produces significant improvements in CISCE board Class 11 students' conceptual understanding of the relationship between ocean temperature, salinity, and density, compared to traditional ITM and conventional teaching methods. The experiment was conducted in Ahmedabad, Gujarat on a sample size of 90 students from three higher secondary schools.

Teaching of Geography in Indian Higher Secondary schools faces criticism for its overemphasis on rote memorization and testing rather than conceptual understanding. The physical geography portion of the CISCE board curriculum faces particular criticism. The present study addresses some of the shortcomings as follows: CISCE Board Curriculum Relevance: The interrelationship between ocean temperature, salinity, and density is a topic prescribed for Class 11 Physical Geography by the CISCE board. This study directly addresses these curricular requirements. India-Appropriate ICT Integration: This research is unique in that it utilizes ICT tools which are largely freely available in India or supported by the Indian government (DIKSHA, OLabs), thus rendering the pedagogical model replicable without

expensive commercial software licenses. Building Digital Competencies: Digital uses in the senior secondary schools of Ahmedabad, Gujarat: Geographical instruction in many senior secondary schools in the English-medium is still predominantly pen-and-paper based, despite many students owning smartphones and broadband. Equipping students with digital competencies is increasingly recognised as essential for thriving in a digital world (OECD, 2019). This experiment is an attempt to fill this gap and to conform to the National Education Policy 2020 (Ministry of Education, 2020). Graphs and Tables Development: A key feature of this research is that students' work generating data tables and graphs was assessed. These are critical elements of geography practical work as tested in the CISCE board examinations. Evidence Based Contribution: Experimental studies concerning ICT integrated inquiry learning for Indian senior secondary geography have limited evidence in published literature. The present study seeks to contribute rigorous experimental evidence through a controlled study with proper sampling and statistical analyses.

Vygotsky (1978) and Piaget (1952) proposed a constructivist, the assumption that learners are active participants in the process of knowledge and understanding construction based on experience and social interaction. Inquiry Training Model is an inquiry based pedagogical model that was originally developed by Suchman (1962) and later by Joyce and Weil (2003) and is based on five phases; problem encountering, data collecting and verifying, experiment, explaining and reflection. Empirical evidence also indicates that the consistent positive effects of inquiry-based instruction on science and geography student performances (Krajcik and Shin, 2014) are raising higher order thinking abilities and conceptual memory. International study shows that ICT improves the inquiry-based learning in science and geography in secondary school, and the average effect sizes of ICT integration are moderate to large (0.40-0.65) when it is successfully incorporated into pedagogy (Cheung and Slavin, 2013). Simulations and virtual laboratory have resulted in a very high increase in conceptual knowledge of students in comparison to traditional laboratory methods (0.45-0.73 d) (Merchant et al., 2014) and the use of mobile devices has been observed to increase student performance in several subjects (Sung, Chang, and Liu, 2016). The cognitive theory of learning with multimedia argues that bifurcated instruction (verbal and visual) helps to improve the learning process through the dual coding capabilities of learners (Mayer, 2009). In India, MHRD's OLABs provides a suite of curriculum-relevant virtual laboratory simulations for CBSE and CISCE curricula and it is freely available online (MHRD, 2021). Furthermore, the DIKSHA portal contains free, curriculum-aligned digital resources that are accessible through mobile phones. Unfortunately, research evidence on the pedagogical efficacy of using these digital tools within a structured pedagogical framework like ITM is severely lacking in the Indian context. The association between ocean temperature, salinity and density is a complex, multi-variable phenomenon that is difficult to learn and remember. The conventional teaching method focuses on providing static visual aids and text-based explanations of these dynamic relationships, offering students little scope for hands-on interaction. According to geoscience education research, data-based, inquiry-based pedagogies are one of the most effective on Earth system process deeper learning strategies than didactic methods (Krajcik and Shin, 2014)

There is a literature gap in terms of the effectiveness of ICT-integrated inquiry learning in Indian higher secondary geography. In particular, no published experimental study

has directly tested the effectiveness of the application of ICT-integrated ITM to the teaching of oceanographic relationships in Class 11 geography in India to CISCE board students.

The present study aimed to-

- **Objective 1:** To find out whether ICT-integrated Inquiry Training Model increases the conceptual understanding of the relationship of ocean temperature, salinity and density of CISCE board Class 11 students compared to traditional ITM and conventional teaching.
- **Objective 2:** To create an ICT-supported Inquiry Training Model lesson plan for students which can be adopted and used widely in India for investigating the temperature-salinity-density relationship and help students collect data and create graphs to analyze it.
- **Objective 3:** To evaluate the digital skills, data analysis skills, graphing skills and collaborative digital skills developed by CISCE board Class 11 students during an ICT-integrated inquiry learning environment.

METHODOLOGY

This study was designed using a quasi-experimental pre-test post-test parallel group design. There were three groups involved-the ICT-integrated Inquiry Training Model group (Group A; N=30), the traditional Inquiry Training Model group (Group B; N=30), and the control group (Group C; N=30). The intervention lasted for eight weeks in 32 class hours during the academic year 2025-26. Three English-medium CISCE affiliated senior secondary schools from Ahmedabad city (Gujarat) were selected for the study. Ahmedabad was chosen as a Tier-1 city with the required infrastructure in terms of school education, smartphone and internet penetration. Ninety Class XI students (45 females and 45 males; mean age 17.2 years) pursuing principles of physical geography were chosen. Students were allocated randomly (stratified by their prior geography grade) into the three groups after obtaining consent.

Table 1: Demographic Profile and Baseline Characteristics of Participants (N = 90)

Characteristic	Group A (ICT-ITM)	Group B (Traditional)	Group C (Control)
Total Students	30	30	30
Male / Female	15 / 15	16 / 14	14 / 16
Mean Age (years)	17.2 (SD=0.4)	17.1 (SD=0.5)	17.3 (SD=0.4)
Mean Prior Score (%)	71.3 (SD=6.8)	70.9 (SD=7.1)	71.6 (SD=6.5)
Smartphone Access	93%	90%	87%
Home Internet Access	80%	77%	83%

All the ICT tools used in the study are freely accessible and readily available in India. They have either been developed or adapted to the Indian curriculum needs. Table 2 provides a list of ICT tools, their Indian equivalents, availability and cost. All these tools were carefully chosen due to their easy availability and reasonable price. OLABS has support of Indian

government and is funded by MHRD, so its resources like the experiments it offers are free of cost to schools and are aligned to CISCE board and CBSEC board curricula. DIKSHA platform hosts various national educational resources supported by NCERT.

Table 2: ICT Tools Employed, Indian Availability, and Alignment with ITM Stages

ICT Tool	Indian Platform / App	India Availability & Cost	ITM Stage
Digital Thermometer (Bluetooth)	Generic Bluetooth sensor	~Rs. 500-800 (Flipkart/Amazon)	II, III
Salinity/TDS Meter (Pen)	Generic TDS pen	~Rs. 300 (widely available)	II, III
Learning Management System	Google Classroom / DIKSHA	Free; DIKSHA govt-supported	I, IV, V
Spreadsheets & Graphing	Google Sheets / LibreOffice Calc	Free / FOSS	IV
Virtual Simulation	OLabs (MHRD-funded) / PhET	Free; OLabs govt-funded for CISCE board	III
Data Visualisation	Google Data Studio / Datawrapper	Free with Google account	IV, V
Video / Multimedia	YouTube / DIKSHA video content	Free; widely accessible	I
Digital Portfolio	Google Sites / Canva (free tier)	Free with school account	V

Using G*Power 3.1 software (Faul et al., 2007), power analysis was conducted for one-way ANOVA with three groups ($\alpha=0.05$, $\text{power}=0.80$, $f=0.40$ based on findings from similar Indian STEM education studies), indicating a total minimum sample of 76 participants was required. The present sample of $N=90$ (30 per group) exceeds this and allows a power of 0.87. Effect sizes were estimated along with 95% confidence intervals using bootstrap sampling. Given the nested structure of students within schools, hierarchical linear modelling considerations (Raudenbush & Bryk, 2002) were examined to confirm that school-level variance did not substantially confound group-level comparisons. The conceptual understanding test comprises of 40 multiple-choice and short-answer questions related to ocean temperature-salinity-density relationship, thermohaline circulation and oceanic layers which are aligned with the CISCE Class XI geography syllabus. The test was reviewed by 3 CISCE Class XI geography teachers for content validity ($\text{CVR}=0.89$). A validated, modified DigComp 2.1 rubric (Vuorikari et al., 2022) was used to assess digital skills development, anchored in the eight-level Digital Competence Framework for Citizens (Carretero, Vuorikari, & Punie, 2017). The digital skills and conceptual achievement rubric were scored by 2 independent scorers and their inter-rater reliability for each rubric (Cohen's $\kappa=0.83$, Landis & Koch, 1977) assured consistency. The teacher assessing post-tests was blinded to student groups, and a random sample of 25% of the questionnaires was scored by a second independent scorer to verify consistency. The

table (Table 3) below presents the systematic lesson plan that is designed to be used with students of Class XI CISCE Board students to facilitate the 40-minute session on interrelationship between ocean temperature, salinity and density.

Table 3: ICT-Integrated Inquiry Training Model based Lesson Plan

Stage	Duration	Teacher / Student Activity	ICT Tools Used
Stage I – Facing the Problem	5 minutes	Teacher played a 90-second INCOIS animation of thermohaline circulation via classroom projector or shared on Google Classroom. Students responded to a Google Forms quick poll; results were displayed instantly as a live bar graph to surface baseline conceptions.	INCOIS animation; Google Classroom; Google Forms (live poll)
Stage II – Data Collection & Validation	10 minutes	Five student groups measured salinity (TDS pen) and temperature (digital thermometer) of four prepared water samples: (a) distilled water at room temperature; (b) 3.5% salt water at room temperature; (c) chilled salt water at 5°C; (d) warm salt water at 35°C. All readings entered into a shared class-level Google Sheet in real-time.	TDS/Salinity pen; Digital thermometer; Google Sheets (shared class data table with conditional formatting)
Stage III – Experimentation & Questioning	10 minutes	Groups accessed the OLABS ‘Density of Liquids’ virtual experiment on smartphones/computers to simulate density changes across varied temperature and salinity conditions safely. Students posted yes/no investigative questions in a shared Google Doc; teacher responded in real-time. An auto-generated Google Sheets scatter plot revealed the inverse temperature–density correlation as data accumulated.	OLABS ‘Density of Liquids’ virtual simulation; Google Docs (collaborative Q & A); Google Sheets (auto scatter plot)
Stage IV – Organising & Formulating Explanations	10 minutes	Each group created in Google Sheets: (a) a group data table; (b) a line graph of temperature vs. salinity; (c) a salinity–density scatter plot with trendline. Charts were shared in the class Google Sheet for peer comparison. Advanced groups designed a visual	Google Sheets (graphs & peer sharing); Canva (infographic – advanced); Google Forms (peer review rubric)

Stage	Duration	Teacher / Student Activity	ICT Tools Used
		summary infographic on Canva. Peer review was conducted via a Google Forms rubric with auto-scored feedback.	
Stage V – Analysis of Inquiry Process	5 minutes	Students completed a metacognitive reflection survey via Google Forms. All groups compiled digital portfolios in Google Sites or Canva, incorporating data tables, graphs, written explanations, and peer review feedback. Class discussion addressed: How do temperature, salinity, and density interact to drive ocean circulation, and why is this relevant to the climate of coastal India?	Google Forms (metacognitive survey); Google Sites / Canva (digital portfolio)

RESULTS AND DISCUSSION

The analysis of data was performed using quantitative statistical tools (one-way ANOVA, post-hoc t-tests, calculation of the effect size, scoring of the digital competency rubric) and the qualitative thematic analysis of the focus group transcripts and portfolio materials. Where applicable, conditional process analysis procedures (Hayes, 2018) informed the examination of mediating relationships between instructional method, engagement, and achievement outcomes. Particular focus of this research is the pivotal position of student-created graphs and data tables as the learning outcomes and pedagogical resources, directly connected to CISCE board geography practical assessment standards.

There was no statistical difference in pre-test mean scores between all three groups ($F(2,87) 0.29, p=0.75$) and thus, the baseline equivalence between all three groups was achieved after stratified random assignment.

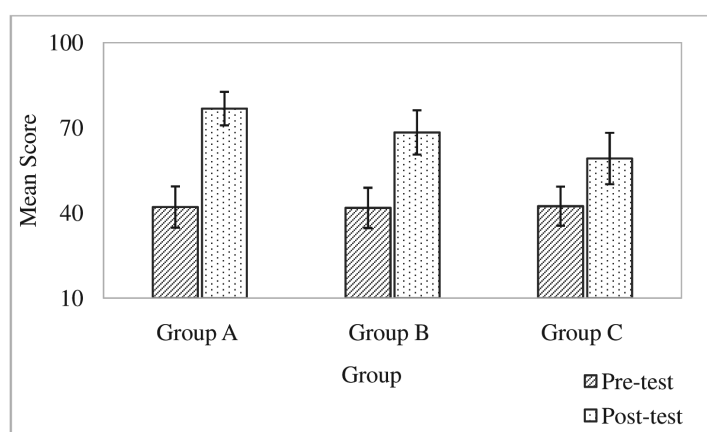


Figure 1: Mean Pre-test and Post-test Scores by Group

Post-test scores (Figure 1) reveal a clear achievement hierarchy favouring Group A (ICT-ITM), followed by Group B (Traditional ITM), with Group C (Conventional) recording the lowest gains. Group A shows the largest post-test gain (+34.7 marks) followed by Group B (+26.6), and Group C (+16.8).

Table 4: One-Way ANOVA — Post-test Achievement Scores Across Three Groups

Source	Sum of Squares	df	Mean Square	F	p
Between Groups	8,142.60	2	4,071.30	52.34	<0.001
Within Groups	6,768.20	87	77.79	—	—
Total	14,910.80	89	—	—	—

The ANOVA yielded a highly significant main effect, $F(2,87)=52.34$, $p<0.001$, eta-squared=0.55, indicating a large effect size. Approximately 55% of the variance in post-test achievement scores is attributable to group (instructional method) differences (Table 4).

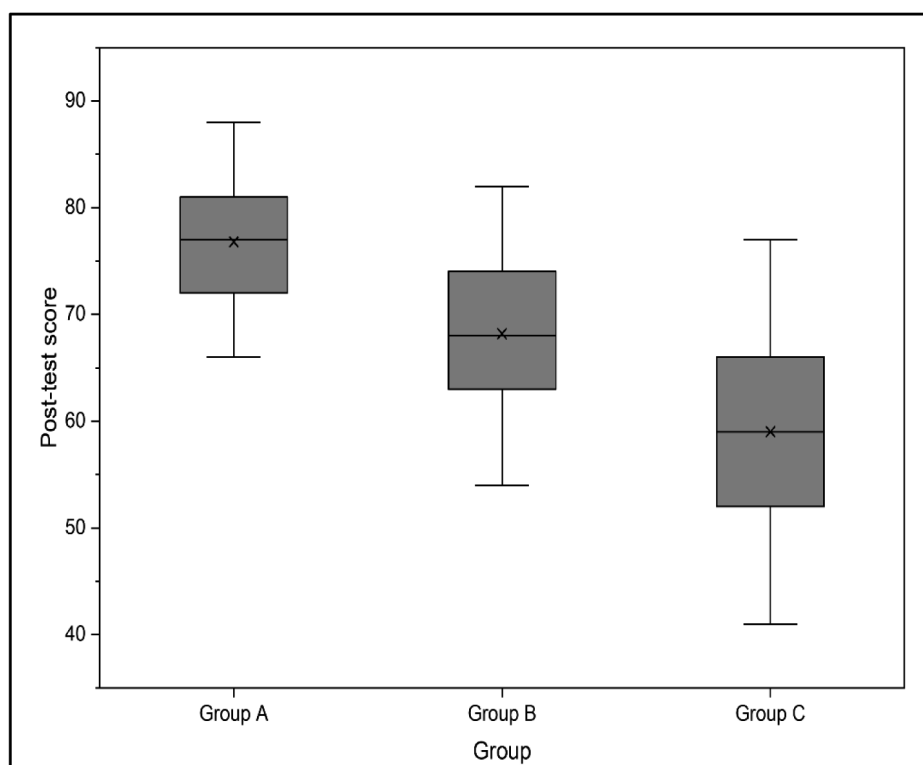


Figure 2: Distribution of Post-test Scores by Group

Group A demonstrates a higher median and tighter distribution, indicating not only superior mean performance but greater consistency of learning outcomes. Constructed in Google Sheets using the chart tool (Figure 2).

Table 5: Tukey HSD Post-hoc Comparisons — Post-test Achievement (N = 90)

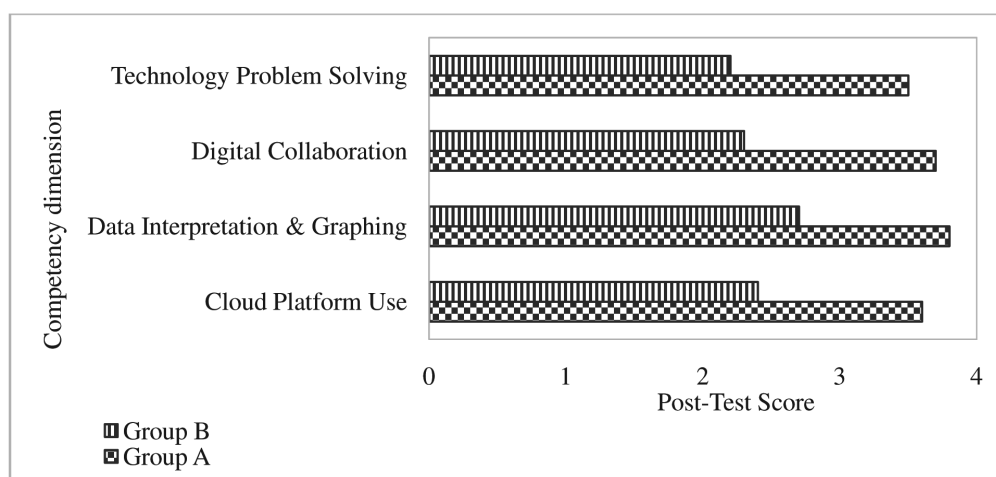
Comparison	Mean Difference	t-value	p-value	Cohen's d
Group A vs Group B	+8.4	4.87	0.001	0.91
Group A vs Group C	+17.6	9.42	<0.001	2.18
Group B vs Group C	+9.2	4.99	<0.001	1.17

All pairwise comparisons (Table 5) reached statistical significance. The greatest difference (Cohen=2.18) is between Group A (ICT-ITM) and Group C (Conventional Instruction), which is a very big and educationally significant difference. The comparison of Group A and Group B (d=0.91) also serves as a confirmation that ICT enhancement of ITM yields meaningfully better results compared to Traditional alone, directly answering the Objective 1.

Table 6: DigComp 2.1 Competency Scores — Group A (Pre and Post; Scale 1-5)

Dig Comp 2.1 Competency	Grp A Pre	Grp A Post
Cloud Platform Use (DIKSHA/Classroom)	1.7	3.6
Data Interpretation and Graphing	2.0	3.8
Digital Collaboration	1.5	3.7
Technology Problem-Solving	1.4	3.5

Table 6 reveals significant pre-to-post improvement in the entire four dimensions of DigComp 2.1 in Group A, with all the differences being significant at $p < 0.001$. Group B showed more modest gains, limited to dimensions practised through traditional ITM. Cloud platform use and digital collaboration skills had minimal development in Group B because these dimensions were not triggered in the traditional approach. These results refer directly to Objective 3.

**Figure 3: Dig Comp 2.1 Competency Profiles for Group A versus Group B (Post-intervention)**

Group A's post-intervention profile substantially encompasses Group B's profile, illustrating superior development across all digital competency dimensions (Figure 3).

The engagement statistics (Google Classroom Analytics and Teacher Observation) affirm that, ICT-enhanced ITM generated significantly greater proportions of resource access, on-time submission, peer interaction, and asynchronous participation than the Traditional ITM and Conventional Instruction (Figure 4). Particularly, the peer comments indicator is interesting because the students in Group A made an average of 4.6 comments per student on shared documents, whereas the students in Group B and C made 1.9 and 0.3, respectively, indicating the collaborative affordances of the ICT-ITM approach. These peer interaction patterns align with research on collaborative learning design, which highlights the importance of carefully structured collaboration to avoid over-scripting that can undermine genuine inquiry (Dillenbourg, 2002).

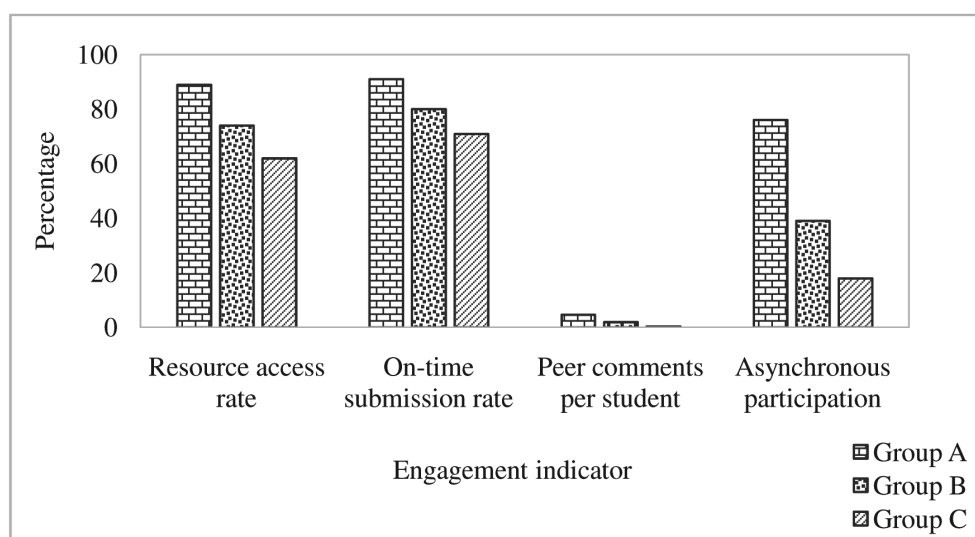


Figure 4: Student Engagement Indicators by Group

Group A consistently records the highest values across all indicators. Constructed in Google Sheets as a class demonstration of comparative data visualisation during Stage IV.

FINDINGS OF THE STUDY

Group A's significantly superior post-test achievement (mean=76.8 vs. 68.4 and 59.2; $F(2,87)=52.34$, $p<0.001$, $\eta^2=0.55$) confirms that ICT-integrated ITM is more effective than both Traditional ITM and Conventional Instruction in developing CISCE board Class 11 students' conceptual understanding of ocean temperature-salinity-density relationships. This effect size (Cohen's $d=2.18$ A vs. C) is very large, which is consistent with previous meta-analyses that have found a substantial impact of technology-augmented inquiry learning over didactic instruction (Cheung and Slavin, 2013; Merchant et al., 2014). Focus group data corroborated quantitative findings: students in Group A repeatedly described the OLABs simulation as enabling

them to 'see' density stratification that is conceptually described but visually imperceptible in a physical classroom experiment. The real-time scatter plot in Google Sheets was cited by multiple students as the point at which the positive salinity-density relationship 'made sense' beyond what the textbook diagram conveyed. The lesson plan implementation was the operationalisation of objective 2. Student groups created four different types of graphs (bar graph, line graph, scatter plot with trendline, radar chart) in Google Sheets, which directly evaluated the skills that were tested in the CISCE board geography practical examination. The portfolio analysis proved that the graphs of Group A students were much more advanced compared to hand-drawn graphs of Group B and the lack of independent graphs of Group C. Group A students were able to appropriately label axes, add trendlines, explain direction of slope, and make statements related to causal explanation in relation to particular data values, showing how competence in graphing can be combined with conceptual knowledge. This supports Objective 2 in its entirety since the lesson plan is a directly replicable resource to CISCE board geography teachers. Group A demonstrated considerable pre-to-post improvements in all four DigComp 2.1 competencies ($p < 0.001$), although Cloud Platform Use represented the greatest absolute increase (1.7 to 3.6). Group A students went beyond basic knowledge of DIKSHA/Google Classroom to the point of independently uploading portfolios, using OLabs experiments, and using shared Google Sheets, and solving minor technical problems. Participants in focus groups indicated that they were more confident with the use of digital tools in academics. The technical issues, such as intermittent internet connectivity and the initial lack of knowledge about TDS pens were successfully addressed with the help of the contingency plans, such as offline Google sheets and teacher demonstration, which aligns with Hirumi (2005) points that the quality of instructional design in online learning is crucial. These results holistically cover Objective 3.

CONCLUSION

This study demonstrates that ICT-integrated Inquiry Training Model significantly enhances CISCE board Class 11 students' conceptual understanding of ocean temperature, salinity, and density relationships, engagement, and digital competency development, all within the realistic infrastructure and resource constraints of urban Indian schools. By employing government-supported Indian platforms (OLabs, DIKSHA), affordable local hardware (TDS pens, digital thermometers), and free cloud tools (Google Classroom, Google Sheets), this study establishes a replicable, India-appropriate pedagogical model that requires neither costly international software licences nor high-specification hardware. The lesson plan, combining real-time data collection, OLabs simulation, Google Sheets graph development, peer review, and Canva-based digital portfolios, provides CISCE board geography teachers with a directly implementable resource. The focus on student-created data tables and graphs is especially well-correlated with CISCE board geography practical assessment, with its solid examination-preparatory value accompanied by theoretical learning returns. Findings align with NEP 2020's vision for technology-integrated, experiential learning; CISCE's curriculum objectives for CISCE board Physical Geography; and UNESCO's SDG 4 commitment to quality, inclusive education. The promotion of digital literacy as a foundational competency for all learners, as articulated in UNESCO's digital literacy policy framework (UNESCO, 2018), further validates the pedagogical model adopted in this study. This study contributes rigorous experimental evidence

to a significant gap in the South Asian educational technology literature, demonstrating that ICT-enhanced inquiry learning is not only effective but practically achievable within India's senior secondary school context. For Curriculum and Policy, CISCE should incorporate ICT-integrated inquiry activities, particularly graph development using digital tools, into CISCE board geography practical guidelines, with OLABs and DIKSHA specifically recommended as free, government-supported resources. State governments in Gujarat and across India should allocate resources for minimum broadband connectivity (2 Mbps) and affordable sensor kits (TDS pens, digital thermometers: approximately Rs. 1,000 per set) in senior secondary schools. B.Ed. and D.El.Ed. teacher education programmes should dedicate 40 to 50 hours specifically to ICT-integrated pedagogy, including structured practice with OLABs, DIKSHA, and Google Workspace for Education, consistent with frameworks for designing teaching and learning in a digital age (Bates, 2015). For Educational Practice, CISCE board geography teachers should adopt the lesson plan presented herein for introducing oceanographic concepts through student-led data collection, OLABs simulation, and Google Sheets graph development. Schools should deploy Google Classroom or DIKSHA as the primary learning management system, given their cost-free availability and government endorsement. Formative assessment must use student-created data tables and graphs as testament of not only conceptual knowledge but also to digital competence, skills directly measured in CISCE board practical assessments. For Future Research, Longitudinal analyses of conceptual retention, at 6, 12, and 24 months follow-up of the intervention, and the sustainability of digital competency improvements across academic years is important. Multi-site replication of semi-urban and rural CISCE board and CBSE schools in Gujarat and other states is necessary to evaluate generalisability outside the urban Ahmedabad setting. Cross-subject replication of ICT-integrated ITM in the other CISCE board physical geography topics, e.g. atmosphere and geomorphology is necessary to test domain generalisability.

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BOOK REVIEW

POLITICS OF EDUCATION IN INDIA: A PERSPECTIVE FROM BELOW

Edited by **Ramdas Rupavath**

Routledge India, New Delhi, 2022. pp. 236. ISBN: 978-0-367-22076-1 (hbk),
DOI: 10.4324/9780429285523

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INTRODUCTION

India's education system faces challenges from neoliberal education, the digital divide, and caste issues. In this context, a book like *Politics of Education in India: A Perspective from Below*, edited by Ramdas Rupavath, is time ripe and significant. The book was published by Routledge India in 2022 with a collection of nineteen articles from scholars across the country. Such contributions provide a considerable amount of evidence and analysis on the continued educational marginalization of the Scheduled Tribe (ST) communities. Emphasis on the methodological orientation of the book is made in the subtitle, "A Perspective from Below." The contributors emphasize tribal experiences, community knowledge, and tribal voices instead of just a policy focused on solving the issue of Adivasi education from the top. This method places the volume in a critical tradition that ranges from Ambedkar's work on education and caste to an emergent subaltern studies and deals with the modern state in India. The book consists of four main parts. In Section I, the historical and political background of Adivasi education has been provided in terms of constitutional provisions (Article 46; Article 275; Article 330; Article 342) and the recent initiatives taken by the government, such as Sarva Shiksha Abhiyan, Right to Education Act (2009), Kasturba Gandhi Balika Vidyalayas, etc. Chapter II: Tribal Education: Achievements and Challenges focuses on aspects of community participation in decentralized education (Chugh and Malik), land ownership and education for the Chenchus of Andhra Pradesh (Reddeppa), and barriers to tribal children's elementary education in various states (Gandhi, Rajak, and Kumar). The issues of governance covered in Section III, Politics of Tribal Education: Intervention of State and Non-State Actors, include issues of poverty's impact on education (Rupavath), implementation of the RTE Act on the Malabar coast of Kerala (Salman A.K.), and cultural changes due to formal education (Rupavath). The more innovative chapters of the book are presented in Section IV – Approaches to Tribal Education – with chapters on barriers to higher education (Rout), school dropout among tribal girls (Das), governance in Fifth Scheduled Areas (Veerasha), the Toda community in the Nilgiris (Parthasarathy), tribal education in Gujarat (D'Souza) and proposals for a new approach to the education system to incorporate tribal knowledge (Misra,

Mishra). The volume ends with essays on language politics (Basistha) and on monastic education in Ladakh as a model for formal education (Rajesh and Anjaria).

SIGNIFICANT THEMES AND CONTRIBUTIONS

Structural Entanglement of Land, Poverty, and Education

One of the key features of this volume is its examination of the impact of material, geographic, and other aspects of context on education. L. Reddeppa's chapter investigates the link between land distribution and school participation in Andhra Pradesh with the Chenchus. Based on 322 families of the Chenchu, Reddeppa provides evidence that land ownership is critical for school attendance, as families lacking secure land will need their children to work in the field. Almost half of the families receiving land could not farm it, either because the land was poorly prepared for cultivation or because it was either not irrigated or lacked access to credit. In the same way, Rupavath's chapter on poverty and Adivasi education (Chapter 7) correlates literacy and dropout with the income of the household in three districts of the state of Andhra Pradesh and Telangana. The findings indicate that families earning less than 25,000 annually are significantly more likely to have children who miss school. In Anantapur district, 51.85% of Scheduled Tribe respondents possess Below Poverty Line cards. These results reinforce the editor's argument that Scheduled Tribes are "doubly disadvantaged," experiencing both geographic isolation and social exclusion based on caste and class.

Outline the Gendered Dimensions of Educational Exclusion

Pankaj Das's chapter on the school drop-out of tribal girls (Chapter 12) is unique for its analytical and contemporary acuteness. Das goes beyond the traditional explanations of parental attitudes and distance of the school, instead focusing on the processes of gender socialization in the tribal communities that she studied in the Mayurbhanj district, Odisha. The interviews with 30 girls who have dropped out of school, 15 teachers, and 42 parents all show the consistent patterns whereby girls are pulled out of school because of their roles in domestic work, expectations for marriage, concerns about virginity, and dowry demands. Das recognizes that girls are more likely to drop out of school to help their families, but boys are encouraged to finish school. He refers to it as "the politics of girls' schooling," where social configurations are deeply entrenched and continue to cause gender disadvantage. Fathers see daughters as their property, and mothers say that chores are a girl's "natural duty". The results of these findings show the total impact of gender roles in tribal society. The chapter is a valuable contribution but would benefit from further discussion on feminist pedagogy in India, as developed by Sharmila Rege, and from an examination of the links between caste and tribe and girls' education (Rege, 2021). Although not consistent throughout the book, the attention to gender is different from many previous books, which treated tribal communities as one. Rupavath's Chapter 9 gives another perspective: Of the 300 students surveyed in five states, most belonged to families with an annual income of less than 25,000, most were first-generation learners, and a large proportion had parents with only a little or no formal education. These contexts create a further disadvantage for girls, such as unsafe conditions in hostels (6/30 girls in Rupavath's study reported safety concerns), anxiety for certain subjects,

and persistent domestic expectations. These difficulties are well recorded in the book, but a more extensive feminist analysis would enhance its relevance in the field of gender studies. Das uses three feminist theories (liberal, socialist, and radical) while other chapters discuss gender more as a secondary rather than a primary axis of inequality. For scholars with a gender studies interest, a sustained editorial focus on feminist and intersectional approaches (caste, tribe, class, gender) would also enhance the value of the book.

Cultural Epistemology and the Critique of Curriculum

Satchidananda Misra's chapter (Chapter 16) is the most theoretically ambitious and argues for a radical overhaul of the Indian educational system. According to Misra, the dominant model that is applied in most of the schools across the nation, which includes the national curriculum, Hindi-English medium instruction, and a focus on the "modernization" of tribal communities, is marginalizing tribal communities by ignoring their epistemologies and traditions. He advocates for incorporating Indigenous knowledge, belief systems, and practices, and traditional ecological knowledge into the educational system, which follows a global conversation for inclusion of Indigenous knowledge in curricula. The chapter on the issues of the Rajbanshi language (18) by Nandini Basistha also reminds us of the importance of using the mother tongue for the preservation of culture and political recognition, but not only as a pedagogical matter. She records the impacts of the exclusion of Adivasi languages from the Eighth Schedule of the Constitution, which Veerasha (Chapter 13) describes as "the politics of domination by the mainstream society on Adivasi society. Rajesh and Anjaria's essay on the education of monastic institutions in Ladakh (Chapter 19) is worth reading. They discuss the Buddhist monastery education as a fruitful resource and suggest that the state take up a partnership and not replace the tradition. This view provides a new discussion of educational diversity in post-colonial India. The chapter is slightly out of the scope of the book, which focuses mainly on the mainland, yet it is still very helpful when analyzing the book.

The State, Non-State Actors, and the Limits of Policy

Salman A.K.'s case study on the implementation of the Right to Education Act in the Malabar coastal region (Chapter 8) is one of the most detailed policy analyses in the book. The chapter shows that, despite good intentions, policies often fail because of administrative delays, inadequate staffing, and a policy that is designed for urban areas but fails to reflect the context of rural tribal regions. The study shows that the teachers of Multi Grade Learning Center (MGLC) are only allocated the amount of 3,000 per month, and are deprived of adequate classroom facilities; moreover, even three years after the enactment of the RTE rules, teachers are still working in thatched classrooms without any proper roof. This highlights an important gap between policy development and its implementation. This is continued in Nayakara Veerasha's chapter on governance in Fifth Scheduled Areas (Chapter 13), which demonstrates that dropout rates among Adivasi children have not reduced significantly even in the areas where intervention by the government has been targeted. In Alirajpur district (Madhya Pradesh), for example, the Adivasi literacy rate is 32.4%, as against the state average of 69.3%. The results suggest that solely infrastructure improvements are not

enough to improve educational outcomes in these areas, but also the need for culturally responsive pedagogy, mother-tongue education, and an understanding of the heterogeneities within Adivasi communities. The meticulous documentation of everyday discriminations that have been experienced by tribal children in schools in Malli Gandhi's chapter (Chapter 5) is also significant, to mention just some examples: They are given menial tasks, separate seats, verbal caste-based and community-based abuse, blocked from access to the library because of assumptions about their caste and community, and subjected to sexual violence. These accounts show that the 'implementation gap' is not only a question of administrative inefficiency and waste, but is entrenched in a pervasive system of caste discrimination that schools are rarely willing to challenge or treat.

Critical Assessment: Methodological and Analytical Considerations

Like every thorough work, this book has some weaknesses, and it is essential to recognize the areas in which it can be improved. There are some interesting methodological issues. Some chapters, especially those by Reddeppa, Rupavath, Das, and Rout, are based on original fieldwork and survey data, while others are mostly secondary literature and policy analysis. Sometimes these methodological shifts are not well-explained. There is a surprising lack of tribal voices in this work, which claims to be a study from the bottom, rather than the tribal perspective being heard directly in interviews or through personal narratives; they are often filtered through the interpretations of the researchers (Atalay, 2012). Furthermore, the majority of the contributors seem to be non-tribal scholars, and the volume does not discuss their positionalities, something very noticeable for a volume focused on "from below" perspectives (Tripura, 2023). Second, the book is broadened by the inclusion of a wide range of theories from Almond and Verba's theory of civic culture to the constitutionalism of Ambedkar and the feminist pedagogy. The latter are rarely integrated or critically compared across the book. The editors' introduction is informative but mainly descriptive; a more integrative and theoretical overview would have improved the coherence and impact of the book. Thirdly, the volume does not cover the important reform of the Indian educational landscape, the National Education Policy 2020. The NEP's focus on mother tongue instruction, tribal universities, and digital learning, which are directly linked to tribal students, deserves more attention. Since the book appeared in the same year as the NEP, even a brief discussion would have enhanced its current relevance. Last but not least, the geographical distribution is unequal. There is a general lack of presence of all Northeastern tribal communities, and also of the major groups in central India, like Gonds and Bhils. This makes one wonder how the book's ideas of "tribal India" might reflect a mainland-centric view, and how it might influence the way the needs of Adivasis are taken up in education.

CONCLUSION

In the context of the politics of education in India, the volume is an important, though somewhat uneven, scholarly contribution. It has some of its most interesting chapters on the investigation of land and education (by Reddeppa), on gender analysis (by Das), on theoretical interventions (by Misra), and on a documentation of discrimination in schools (by Gandhi),

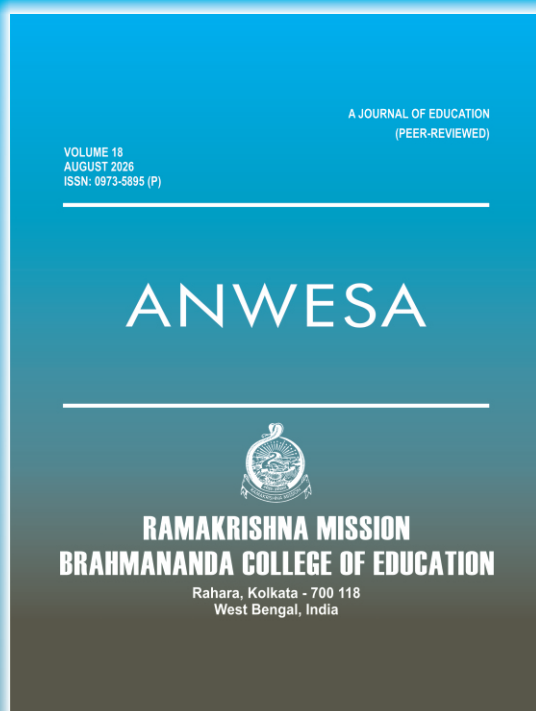
which are examples of the kind of rigorous scholarship that is called for in this type of work. The book is not naively optimistic about policies, but also highlights the fact that the difference between constitutional promises and real lived experiences in the tribally lived world is not only a problem of implementation but also an issue of structural, epistemic, and gender dynamics. It is commendable that Ramdas Rupavath, one of the authors of the volume, has brought together such a multi-disciplinary and diverse set of chapters. The book has some shortcomings, as does any book, which is the unevenness in the theoretical engagement, the lack of discussion on NEP 2020, the clear focus on academic rather than personal tribal stories, and the uneven attention paid to gender; but this is not a detraction from the overall significance of this book. Rather, they offer avenues for further investigations. This volume is highly recommended for scholars and students in education policy, tribal studies, subaltern studies, South Asian politics, and gender and education. It offers a valuable empirical input to feminist scholars and suggests additional theoretical analysis of gender. This book is useful to any library that has an interest in social justice and democratic education in India.

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