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(JoE)

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About the Journal

The Journal of Educare (JoE) was launched in 2024 by the Department of Education, Aliah University, Park Circus Campus, 17 Gorachand Road, Kolkata-700014, West Bengal, India. This journal aims to disseminate information about theory, practice, and research in the field of education and its allied subjects. JoE is dedicated to advancing research and innovations in diverse fields within Educational Philosophy, Educational Psychology, Educational Sociology, Educational Technology, Inclusive Education, Open and Distance Learning, Value and Peace Education, Teacher Education, Women Education, Pedagogy of School Subjects, and Assessment and Evaluation, among others. JoE offers an online presence, enhancing accessibility for both readers and authors globally.

JoE is committed to embracing technological advancements, ensuring that the latest research is easily accessible online. This digital availability broadens the journal's reach, allowing it to engage with a global audience of scholars and researchers. JoE is a peer-reviewed, contributed, biannual journal. JoE will be published twice a year, from 2024 onwards, in January to June and July to December. The journal may be accessed at: https://educare.aliah.ac.in

The editorial board of JoE comprises experts from the diverse discipline of education who are eminent scholars from various prominent universities, ensuring that all submissions undergo thorough and rigorous peer review. The journal welcomes submissions from authors worldwide, providing a valuable platform for sharing research and fostering collaboration within the academic community.

Overall, the Journal of Educare (JoE) will play a crucial role in the dissemination of knowledge and research within the field of education and its allied subjects. Its dedication to high-quality research, a stringent peer-review process, and a strong online presence will make JoE an indispensable resource for researchers.

Call for Contributions

This biannual publication is for all of us: researchers, students, teachers, teacher educators, administrators And policy makers. It seeks to provide a platform and build a network for our ideas and reflections. To enable this journal to reflect all ideas, we must contribute to it in as many ways as we can. We look forward to many contributing with different experiences, questions, suggestions, perspectives as well as critical comments on different aspects of education. The contributions could be in the form of research articles. We also seek comments and reflections on the current issue to improve publication and make it a participative endeavour. We must together make this journal truly reflective of our ideas. We look forward to receive your contributions for the forthcoming issue. We also look forward to your comments and suggestions. The contributions can be sent to the following:

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- **Manuscript Preparation:** Prepare manuscripts according to the journal's format (Annexure-A).
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- **Originality:** Manuscripts must be original and not previously published or under consideration elsewhere.
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- **Length:** Manuscripts should be 3,000 to 4,000 words, including references and appendices. The total number of pages should not exceed 10.
- **References:** Cite references in-text using the author-date system and list them alphabetically at the end of the manuscript. Follow APA style (7th Edition).
- **Formatting:** Follow the JoE template for formatting, including headings, subheadings, and reference formatting. The sample format template (Annexure-A) can be downloaded from the journal's website.
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- **Figures and Tables:** Include figures and tables within the manuscript, numbered and labelled appropriately. Place them in relevant locations within the text.
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* Use A4 paper size (210 x 297 mm).
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    - Justify text fully (except for centred headings).
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Make sure you agree with these above guidelines before submission.

Editorial

Editorial

This issue (Vol.2, Issue-2, July-December 2025) of the Journal of Educare (JoE) presents a diverse collection of scholarly works that address critical and emerging concerns in contemporary education in India. The contributions collectively explore themes such as learner self-belief, mental health, digital and financial literacy, artificial intelligence in education, pedagogical innovation, academic support systems, inclusive policies, and institutional development, all aimed at strengthening educational quality and equity.

The Journal of Educare (JoE), Volume 2, Issue 2 (December 2025), features a range of research papers focused on psychological factors in learning, digital education, and the socio-emotional well-being of vulnerable populations in India.

The volume includes studies on the following key areas:

- Psychological Foundations: Establishes a significant positive link between student self-efficacy and academic achievement.
- Welfare of Orphaned Youth: Highlights a sharp drop in school retention at the higher secondary level and advocates for mental health support to combat high rates of anxiety.
- Technological Shift: Explores the ethical integration of Artificial Intelligence (AI) as a supplement to human teaching.
- Policy & Equity: Analyses NEP 2020 implementation, the role of modern libraries, and the impact of government schemes on Scheduled Tribe (ST) education.
- Holistic Literacy: Emphasizes the need for Digital Financial Literacy and Sustainable Development in school curricula.

A major emphasis of this issue is student development and psychological wellbeing. Manuscripts highlight how learners' confidence and emotional health strongly influence academic success, particularly among higher secondary students and vulnerable groups such as orphaned youth. Education is presented not only as a means of academic advancement but also as a powerful tool for emotional recovery, resilience, and long-term wellbeing.

Another significant focus is digital learning and cognitive growth. The articles examine students' ability to critically engage with digital information and develop metacognitive skills, while also discussing the growing role of artificial intelligence in reshaping teaching and learning processes. These discussions underline the importance of technology-enabled, personalized learning environments that prepare learners for a rapidly evolving digital future.

Teacher education and future-readiness form a central thread, with attention given to innovative pedagogical approaches that promote creativity, collaboration, critical thinking, and digital competence. The need for reimagining teacher preparation to meet the demands of 21st-century classrooms is strongly emphasized.

Institutional reform and academic support systems are also explored, particularly the evolving role of university libraries and innovative platforms in enhancing research culture, digital access, and educational outcomes. Policy-oriented analyses further stress the importance of financial education and targeted government initiatives to support marginalized communities.

Overall, this issue offers a comprehensive perspective on the challenges and opportunities within the Indian education system. It encourages collaboration among institutions, policymakers, and educators to improve learner outcomes and societal wellbeing, while acknowledging the valuable contributions of all those involved in bringing this issue together.

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SELF-EFFICACY IN RELATION TO ACADEMIC ACHIEVEMENT OF HIGHER SECONDARY LEARNERS IN WEST BENGAL

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ABSTRACT

Recent emphasis on educational quality and learners' personal development has intensified scholarly interest in the association between self-efficacy and academic achievement. Self-efficacy, defined as an individual's belief in their capability to achieve desired academic outcomes, plays a crucial role in shaping motivation and performance. The present study examined 'the relationship between self-efficacy and academic achievement among higher secondary learners in West Bengal through a descriptive quantitative design employing correlational analysis.' The sample comprised 972 Class XI students (454 boys and 518 girls) selected through simple random sampling. Academic achievement was determined from official school records, while self-efficacy was measured using a standardized scale developed by the researcher. Findings revealed 'a statistically significant positive correlation between self-efficacy and academic achievement' ($r = 0.276$), suggesting that learners with higher self-efficacy tend to perform better academically, irrespective of gender, locale, or academic stream. The results underscore the importance of enhancing self-efficacy beliefs as a means to improve student achievement. These insights hold implications for educational policy and classroom practice, emphasizing the need for teacher training, motivational support systems, and instructional strategies that nurture students' confidence, goal-setting, and perseverance in learning.

Keywords: *Self-efficacy, gender, locale, academic stream, academic achievement, higher secondary learners*

INTRODUCTION

Self-efficacy speaks to self-assurance in one's capacity to plan and carry out the actions required to handle upcoming circumstances. The construct was first introduced by Albert Bandura (1977) within the broader framework of his Social Cognitive Theory, which emphasizes the dynamic interaction among personal factors, behavior, and environment. According to this theory, human functioning is influenced by a continuous reciprocal interaction between cognitive, behavioral, and contextual determinants. Within this framework, self-efficacy operates as a central mechanism through which individuals regulate their motivation, thoughts, and actions to achieve desired outcomes. Hence, Bandura's model provides a theoretical lens to understand how beliefs about personal competence directly influence learning behaviors, persistence, and achievement.

Bandura (1995) identified four potential sources of self-efficacy:

- **Mastery experience:** The capacity to thrive in situations with high demands is known as mastery experience. When a major job is accomplished and effort is put forth over time, self-efficacy usually increases.
- **Vicarious experience:** A student may feel more autonomous if they believe they have similar skills and knowledge after witnessing others demonstrate mastery.
- **Verbal persuasion:** Affirmation and support can increase self-efficacy. Getting the proper answer is not as important for increasing self-efficacy as acknowledging adequate effort and tenacity.
- **Physical and emotional states affect self-efficacy:** One's physical and mental health have an impact on their sense of self-efficacy. An individual who approaches mathematics with anxiety, for instance, will not feel confidence in themselves; conversely, someone who helps someone overcome nervousness would feel more confident.

According to Bandura, 'people may be persuaded that they have the abilities and knowledge required for success.' People can 'overcome self-doubt and focus on giving the work' their best effort when they get vocal encouragement from others (Bandura, 1997). Although people stay little as long as they maintain their *'sense of self-efficacy'* via achievement, they are usually more driven to grow and learn. Our perception of self-efficacy can be greatly impacted by our emotional and individual responses to situations. A person's attitude, mental state, bodily response, and stress level are just a few of the variables that might affect how they see their own abilities in a certain situation. Through their education and experiences, children get a deeper understanding of both themselves and the world around them. Their experiences with different jobs, people, and situations have an impact on their evolving and shifting *'sense of self-efficacy.'* Self-efficacy begins to emerge in very young infants. Self-efficacy, once developed, is not fixed; rather, it is flexible and may change in response to a person's experiences. When children are young, parents' freedom is essential. Around the ages of 12 to 16, teenage friends also begin to play a big part in providing self-efficacy and confidence. Adolescents are shielded from a decline in academic self-efficacy by their association with peer groups. Conversely, those who see their friends succeed have higher levels of educational self-efficacy. In one study, those between the ages of 14 and 18 who were more content with their life five years later were those who had greater levels of social and educational self-efficacy.

Although a substantial body of international research has established a positive relationship between self-efficacy and academic achievement, most existing studies have been conducted in Western cultural settings or have focused narrowly on specific subject areas such as mathematics or science. Consequently, there is limited empirical evidence addressing how self-efficacy operates among higher secondary learners within the Indian context, where sociocultural expectations, examination-driven learning patterns, and resource disparities may exert distinctive influences on students' confidence and academic performance. Furthermore, previous studies have often emphasized statistical correlations without sufficiently integrating Bandura's theoretical propositions or exploring the mediating role of contextual variables in shaping self-efficacy beliefs.

Hence, 'the present study seeks to bridge this theoretical and empirical gap by examining the relationship between self-efficacy and academic achievement among higher secondary learners in India, grounded firmly in Bandura's Social Cognitive Theory.' By situating the investigation within this theoretical framework, the study aims to contribute to a deeper understanding of the psychological determinants of academic success and to provide valuable implications for educators, curriculum designers, and policymakers seeking to foster self-efficacious learners who are motivated, resilient, and capable of lifelong learning.

SIGNIFICANCE OF THE STUDY

- The current study 'might be beneficial in raising awareness of the value of self-efficacy' in educational settings among both instructors and learners.
- Teachers and learners can benefit from this study by learning about several tactics that have a significant influence on improving self-efficacy.
- This research helps teachers better understand learners' self-efficacy levels during classroom instruction, which helps them make complex topics manageable.
- Teachers may find this study useful in learning how self-efficacy positively affects learners' academic progress.
- Administrators would benefit from this study by being aware of how important self-efficacy is to the 'teaching and learning process.'
- In addition to helping instructors execute numerous tactics that may encourage pupils, this study would provide insight into the positive influence of self-efficacy on academic performance.
- In order to boost learners' self-efficacy, this study would help teachers decide when and how to reward, praise, and encourage their pupils in the classroom.
- Teachers, legislators, and other stakeholders will use the study's findings to improve their professional identities and address the subpar academic outcomes caused by psychological factors.

OBJECTIVES OF THE STUDY

1. To assess 'the level of self-efficacy in relative percentage with reference to total sample and selected demographic variables viz., gender (boys & girls), locale (urban & rural) and academic stream (arts & science) of higher secondary learners in West Bengal.'
2. To assess 'the level of academic achievement in relative percentage with reference to total sample and selected demographic variables viz., gender (boys & girls), locale (urban & rural) and academic stream (arts & science) of higher secondary learners in West Bengal.'
3. To investigate how 'self-efficacy and academic achievement' relate to each other among West Bengal higher secondary learners.'
4. To investigate how 'self-efficacy and academic achievement relate to each other among West Bengal higher secondary learners in respect of gender, locale and academic stream.'

HYPOTHESES OF THE STUDY

H_{01} There is no significant relationship in the coefficient of correlation between Self-efficacy and Academic Achievement of higher secondary learners in West Bengal.

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H_{02} There is no significant relationship in the coefficient of correlation between Self-efficacy and Academic Achievement of higher secondary level boy learners in West Bengal.

H_{03} There is no significant relationship in the coefficient of correlation between Self-efficacy and Academic Achievement of higher secondary level girl learners in West Bengal.

H_{04} There is no significant relationship in the coefficient of correlation between Self-efficacy and Academic Achievement of higher secondary level urban learners in West Bengal.

H_{05} There is no significant relationship in the coefficient of correlation between Self-efficacy and Academic Achievement of higher secondary level rural learners in West Bengal.

H_{06} There is no significant relationship in the coefficient of correlation between Self-efficacy and Academic Achievement of higher secondary level arts learners in West Bengal.

H_{07} There is no significant relationship in the coefficient of correlation between Self-efficacy and Academic Achievement of higher secondary level science learners in West Bengal.

RESEARCH METHODOLOGY

'A descriptive study design' was employed. West Bengal's higher secondary schools were the subject of an extensive assessment. All quantitative data obtained from the participants were systematically coded and analysed using the SPSS, ensuring precision and reliability in the computation of descriptive and inferential statistics.

Population and Sample

All of the learners registered in higher secondary schools in West Bengal, make up the study's population. The sample consisted of 972 higher secondary learners. It was chosen from 11th grade learners at different higher secondary schools located in both rural and urban areas using a simple random sampling procedure.

Table 1: '*Administrative Division wise Description of the Sample*'

Sl. No.	Name of the Divisions	Name of the Districts	Gender		Locale		Academic Stream		Total Sample
			Boys	Girls	Urban	Rural	Arts	Science	
1.	Presidency	Nadia	59	75	84	50	61	73	134
		South 24 Pgs	47	45	59	33	44	48	92
2.	Medinipur	Purulia	33	28	24	37	37	24	61
		Purba Medinipur	48	35	40	43	36	47	83

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3.	**Burdwan**	**Purba Bardhaman**	39	73	46	66	70	42	112
		Paschim Bardhaman	38	46	54	30	53	31	84
4.	**Malda**	**Malda**	76	88	96	68	73	91	164
		Murshidabad	58	52	50	60	68	42	110
5.	**Jalpaiguri**	**Alipurduar**	32	40	46	26	43	29	72
		Jalpaiguri	24	36	28	32	35	25	60
Total Sample			**454**	**518**	**545**	**427**	**520**	**452**	**972**

TOOL USED IN THE STUDY

The study made use of the researcher's 'Self-Efficacy Scale.' It is made up of four components: self-confidence, optimistic attitude, effectiveness expectation, and result expectation. With construct validity proven at 0.85 and test-retest reliability at 0.82, the self-efficacy measure was demonstrated to be both valid and reliable. The academic success score from the sampled learners' prior class (10th Standard) was considered.

Table 2: *'Dimension-wise Distribution of Items'*

Dimensions	Item Number	Total
Self-confidence	1, 2, 3, 4, 5	**5**
Efficacy Expectation	6, 7, 8, 9, 10	**5**
Positive Attitude	11, 12, 13, 14, 15	**5**
Outcome Expectation	16, 17, 18, 19, 20	**5**
Scale	**1 to 20**	**20**

The present scale is based on the 'Five Point Likert Scale with the five possible responses against each statement: Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D), and Strongly Disagree (SD).' Since the scale has both positive and negative framed statements so the responses were scored according to the scoring table given below –

Table 3: *'Scoring System of Self-efficacy Scale'*

Sr. No	Type of Statement	Strongly Agree (SA)	Agree (A)	Undecided (U)	Disagree (D)	Strongly Disagree (SD)
1.	**Positive**	5	4	3	2	1
2.	**Negative**	1	2	3	4	5

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DATA COLLECTION

The researcher visited the schools in person with permission from the headmasters of each school. Before distributing the tool to the learners, the researcher had a brief discussion with them to obtain correct answers. Important instructions on how to mark replies in connection to each tool statement were given to learners.

ANALYSIS AND INTERPRETATION OF DATA

a. Percentage Analysis

Objective 1: *'To assess the level of self-efficacy in relative percentage with reference to total sample and selected demographic variables viz., gender (boys & girls), locale (urban & rural) and academic stream (arts & science) of higher secondary learners in West Bengal.'*

Table-2: '*Percentage of Higher Secondary Learners having different Levels of Self-Efficacy on the basis of Total Sample*'

Levels of Self-Efficacy	Total Number (N=972)	Percentage (%)
High Self-Efficacy	275	28.27
Moderate Self-Efficacy	518	53.34
Low Self-Efficacy	179	18.39

Table 2 shows that, *'out of 972 higher secondary learners, only 275 learners (28.27%) are having High level of Self-efficacy (HSE), 518 learners (53.34%), i.e. majority of higher secondary learners have a Moderate level of Self-efficacy (MSE) and 179 learners (18.39%) are having Low level of Self-efficacy (LSE).'* It also indicates that the scores for self-efficacy are relatively consistent across the sample, as supported by the relatively low standard deviation.

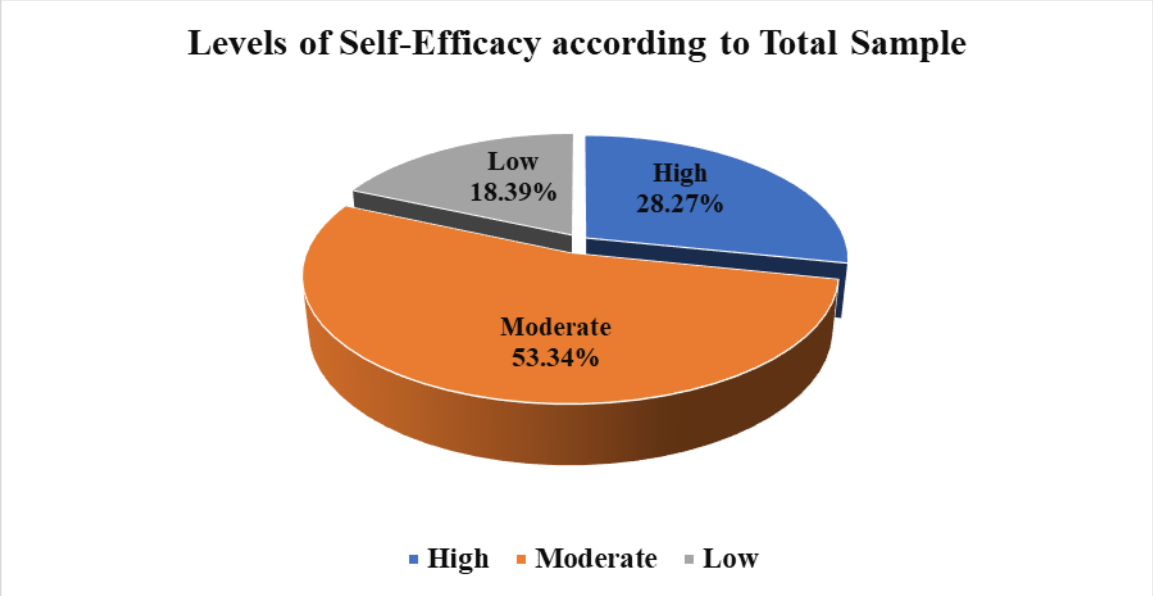

Figure 1: '*Showing Percentage of Learners with reference to the levels of Self-Efficacy of Higher Secondary Learners in West Bengal*'

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Table-3: 'Percentage *of Higher Secondary Learners having different Levels of Self-Efficacy with respect to Gender (Boys and Girls)'*

Levels of Self-Efficacy	Gender			
	Boys (N=454)	Percentage (%)	Girls (N=518)	Percentage (%)
High Self-Efficacy	103	22.61	133	25.61
Moderate Self-Efficacy	263	57.91	300	58.02
Low Self-Efficacy	88	19.48	85	16.37

Table 3 depicts that *'22.61% (103) of boy and 25.61% (133) of the girl learners held the High level of Self-efficacy (HSE). 19.48% i.e. 88 boy and 16.37% (85) girl learners had Low level of Self-efficacy (LSE). Similarly, 57.91% (263) boy and 58.02% (300) girl learners fell into the category of learners who were having Moderate level of Self-efficacy (MSE) respectively.'* It can be inferred from the data that most learners in the sample have moderate level of self-efficacy, and relatively fewer learners have high or low level of self-efficacy.

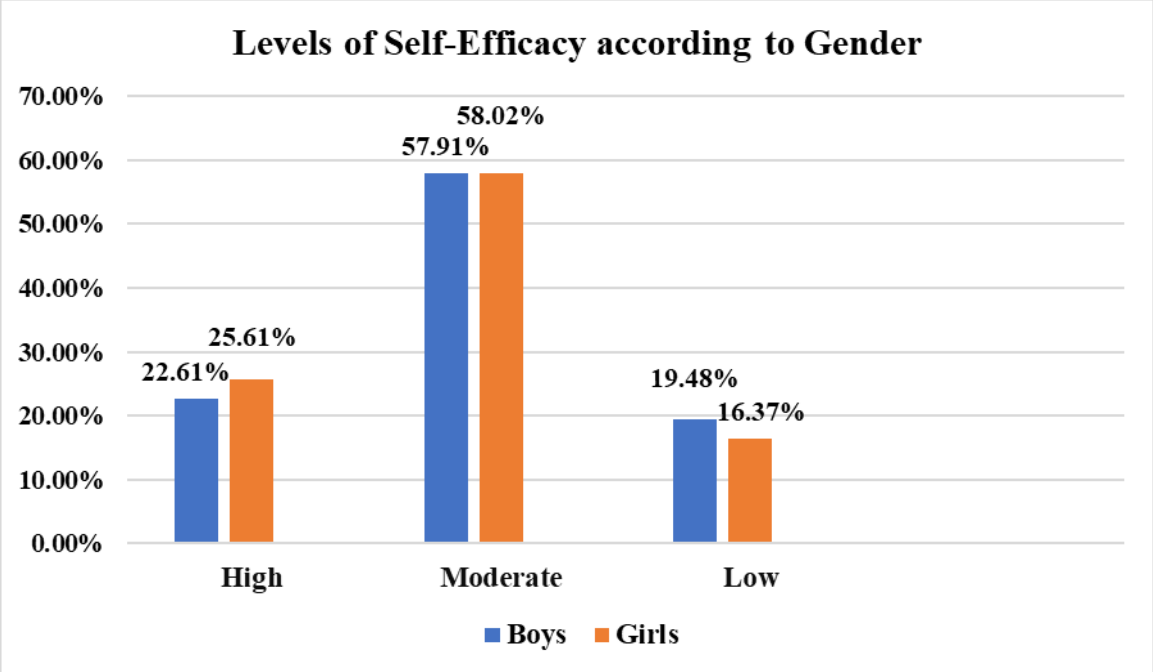

Figure 2: '*Showing Gender wise Percentage of Learners with reference to the levels of Self-Efficacy of Higher Secondary Learners in West Bengal'*

Table-4: '*Percentage of Higher Secondary Learners having different Levels of Self-Efficacy with respect to Locale (Rural and Urban)'*

	Locale

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Levels of Self-Efficacy	Urban (N=545)	Percentage (%)	Rural (N=427)	Percentage (%)
High Self-Efficacy	149	27.29	100	23.41
Moderate Self-Efficacy	297	54.52	257	60.31
Low Self-Efficacy	99	18.19	70	16.28

Table 4 depicts that *'27.29% (149) of urban and 23.41% (100) of the rural learners held the High level of Self-efficacy (HSE). 54.52% i.e. 297 and 18.19% (99) learners from the urban background had Moderate level of Self-efficacy (MSE) and Low level of Self-efficacy (LSE). Similarly, 60.31% (257) and 16.28% (70) learners coming from rural background showed Moderate level of Self-efficacy (MSE) and Low level of Self-efficacy (LSE) respectively.'* It can be inferred from the data that most learners in the sample have moderate level of self-efficacy, and relatively fewer learners have high or low level of self-efficacy.

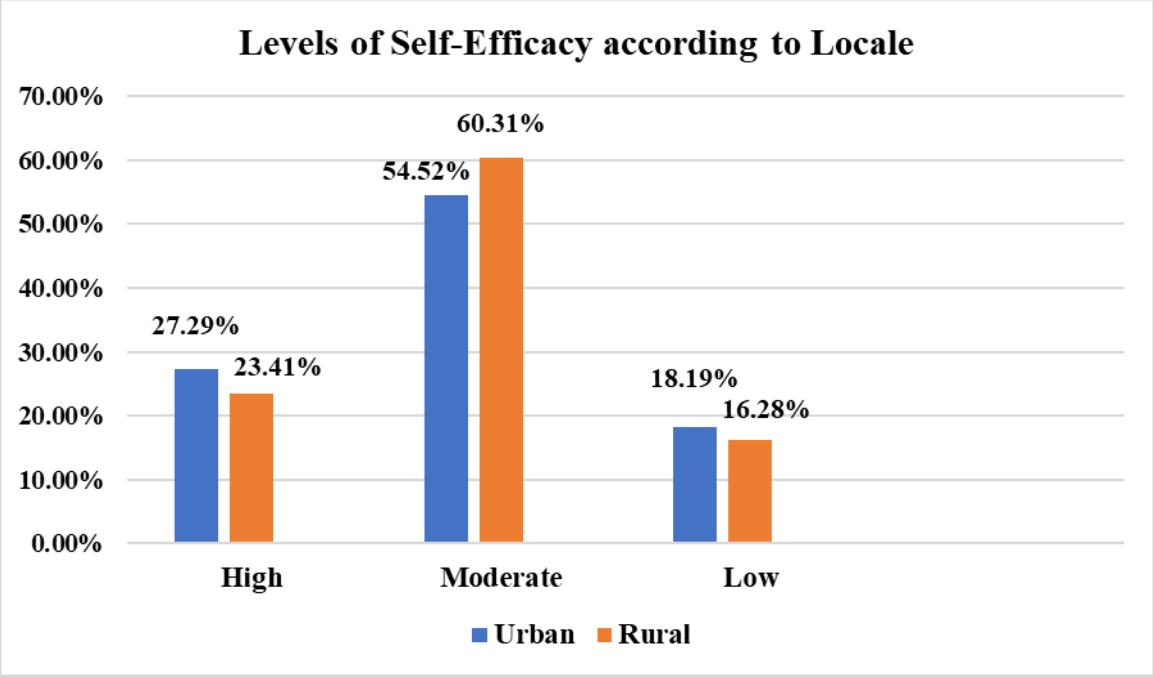

Figure 3: '*Showing Locale wise Percentage of Learners with reference to the levels of Self-Efficacy of Higher Secondary Learners in West Bengal*'

Table-5: '*Percentage of Higher Secondary Learners having different Levels of Self-Efficacy with respect to Academic Stream (Arts and Science)*'

Levels of Self-Efficacy	Academic Stream			
	Arts (N=520)	Percentage (%)	Science (N=452)	Percentage (%)

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High Self-Efficacy	112	21.49	147	32.46
Moderate Self-Efficacy	299	57.60	236	52.15
Low Self-Efficacy	109	20.91	69	15.39

Table 5 depicts that *'21.49% (112) of arts and 32.46% (147) of science learners held High level of Self-efficacy (HSE). 57.60% i.e. 299 and 20.91% (109) learners from the arts background had Moderate level of Self-efficacy (MSE) and Low level of Self-efficacy (LSE). Similarly, 52.15% (236) and 15.39% (69) learners coming from science background showed Moderate level of Self-efficacy (MSE) and Low level of Self-efficacy (LSE) respectively.'* It can be inferred from the data that most learners in the sample have moderate level of self-efficacy, and relatively fewer learners have high or low level of self-efficacy.

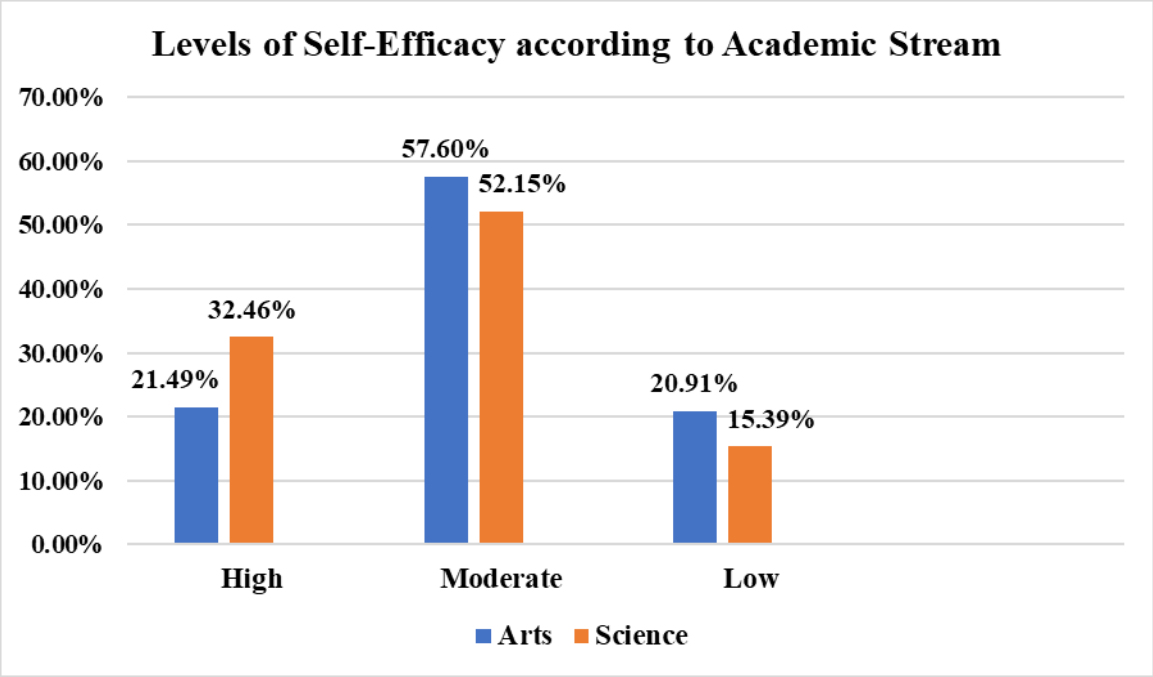

Figure 4: '*Showing Academic Stream wise Percentage of Learners with reference to the Levels of Self-Efficacy of Higher Secondary Learners in West Bengal*'

Objective 2: *'To assess the level of academic achievement in relative percentage with reference to total sample and selected demographic variables viz., gender (boys & girls), locale (urban & rural) and academic stream (arts & science) of higher secondary learners in West Bengal.'*

Table-6: '*Percentage of Higher Secondary Learners having different Levels of Academic Achievement on the basis of Total Sample*'

Levels of Academic Achievement	Total Number (N=972)	Percentage (%)
High Academic Achievement	304	31.28

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Moderate Academic Achievement	448	46.11
Low Academic Achievement	220	22.61

Table 6 shows that, *'out of 972 higher secondary learners, only 304 learners (31.28%) are having High level of Academic Achievement (HAA), 448 learners (46.11%), i.e. majority of higher secondary learners have a Moderate level of Academic Achievement (MAA) and 220 learners (22.61%) are having Low Academic Achievement (LAA).'* It can be inferred from the data that most learners in the sample have moderate level of academic achievement, and relatively fewer learners have high or low level of academic achievement. It also indicates that the scores for academic achievement are relatively consistent across the sample, as supported by the relatively low standard deviation.

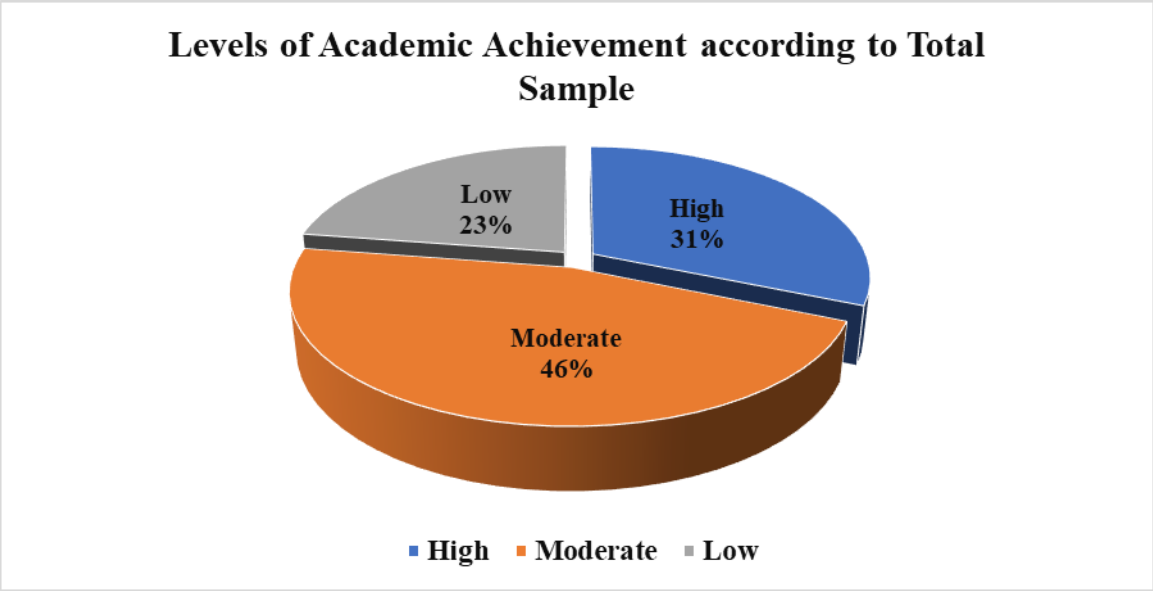

Figure 5: '*Showing Percentage of Learners with reference to the Levels of Academic Achievement of Higher Secondary Learners in West Bengal*'

Table-7: '***Percentage of Higher Secondary Learners having different Levels of Academic Achievement with respect to Gender (Boys and Girls)***'

Levels of Academic Achievement	**Gender**			
	Boys (N=454)	**Percentage (%)**	**Girls (N=518)**	**Percentage (%)**
High Academic Achievement	113	24.89	146	28.19
Moderate Academic Achievement	246	54.08	272	52.53

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Low Academic Achievement	95	21.03	100	19.28

Table 7 depicts that *'24.89% (113) of boy and 28.19% (146) of the girl learners held the High level of Academic Achievement (HAA). 21.03% i.e. 95 boy and 19.28% (100) girl learners had Low level of Academic Achievement (LAA). 54.08% (246) boy and 52.53% (272) girl learners fell into the category of learners who were having Moderate level of Academic Achievement (MAA) respectively.'* It can be inferred from the data that most learners in the sample have moderate level of academic achievement, and relatively fewer learners have high or low level of academic achievement.

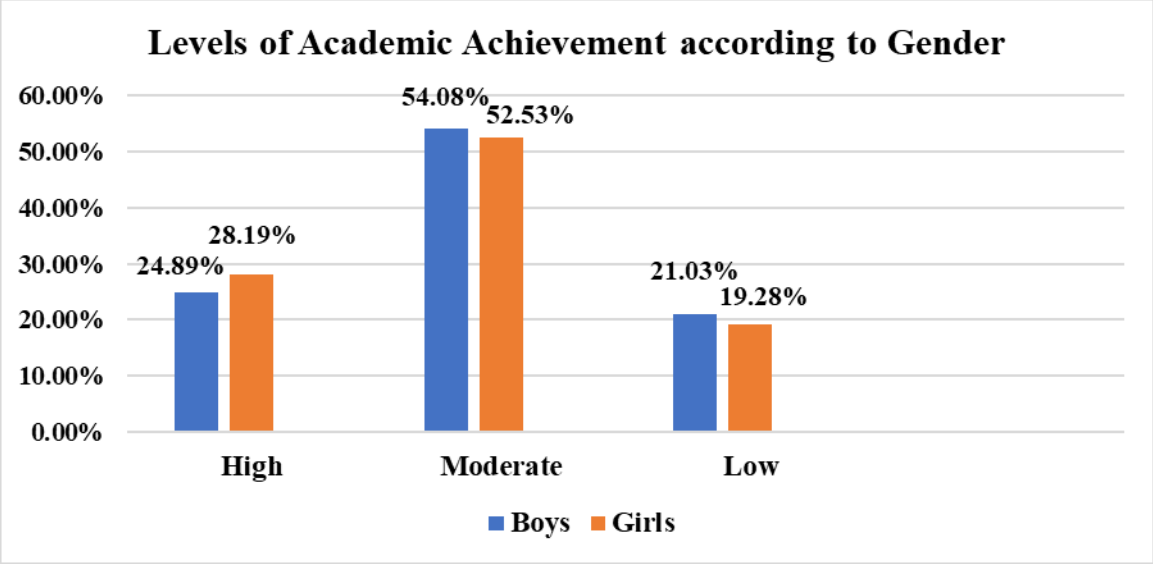

Figure 6: '*Showing Gender wise Percentage of Learners with reference to the levels of Academic Achievement of Higher Secondary Learners in West Bengal*'

Table-8: '*Percentage of Higher Secondary Learners having different Levels of Academic Achievement with respect to Locale (Rural and Urban)*'

Levels of Academic Achievement	Locale			
	Urban (N=545)	**Percentage (%)**	**Rural (N=427)**	**Percentage (%)**
High Academic Achievement	221	40.62	86	20.12
Moderate Academic Achievement	246	45.09	209	49.02
Low Academic Achievement	78	14.29	132	30.86

Table 8 depicts that *'40.62% (149) of urban and 20.12% (86) of the rural learners held the High level of Academic Achievement (HAA). 45.09% i.e. 246 and 14.29% (78) learners from*

the urban background had Moderate level of Academic Achievement (MAA) and Low level of Academic Achievement (LAA). Similarly, 49.02% (209) and 30.86% (132) learners coming from rural background showed Moderate level of Academic Achievement (MAA) and Low level of Academic Achievement (LAA) respectively.' It can be inferred from the data that most learners in the sample have moderate level of academic achievement, and relatively fewer learners have high or low level of academic achievement.

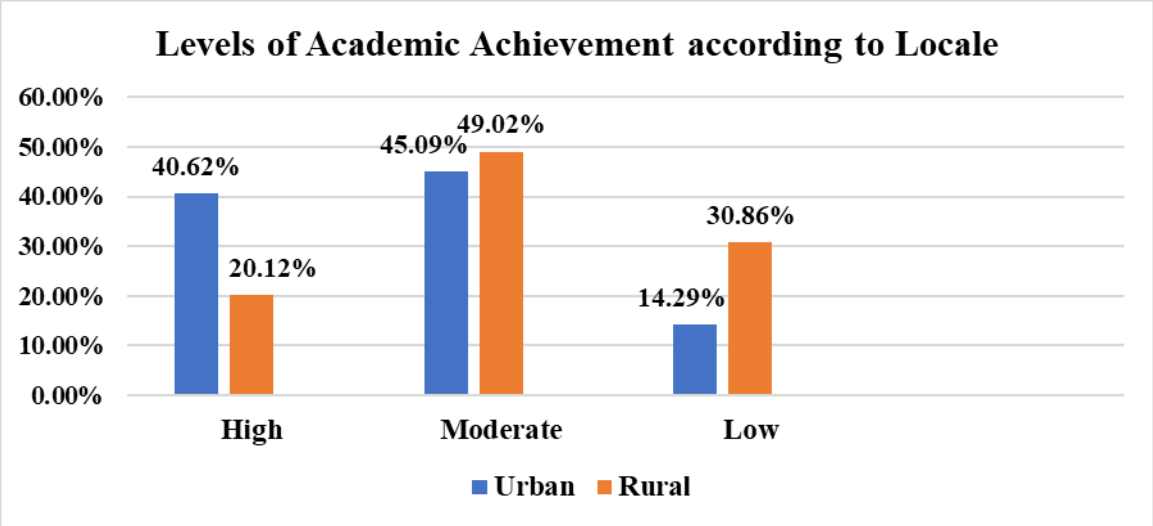

Figure 7: *'Showing Locale wise Percentage of Learners with reference to the Levels of Academic Achievement of Higher Secondary Learners in West Bengal'*

Table-9: *'Percentage of Higher Secondary Learners having different Levels of Academic Achievement with respect to Academic Stream (Arts and Science)'*

Levels of Academic Achievement	Academic Stream			
	Arts (N=520)	Percentage (%)	Science (N=452)	Percentage (%)
High Academic Achievement	102	19.64	181	40.12
Moderate Academic Achievement	244	46.87	197	43.49
Low Academic Achievement	174	33.49	74	16.39

Table 9 depicts that *'19.64% (102) of arts and 40.12% (181) of the science learners held the High level of Academic Achievement (HAA). 46.87% i.e. 244 and 33.49% (174) learners from the arts background had Moderate level of Academic Achievement (MAA) and Low level of Academic Achievement (LAA). Similarly, 43.49% (197) and 16.39% (74) learners coming from science background showed Moderate level of Academic Achievement (MAA) and Low level of Academic Achievement (LAA) respectively.'* It can be inferred from the data that most learners

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in the sample have moderate level of academic achievement, and relatively fewer learners have high or low level of academic achievement.

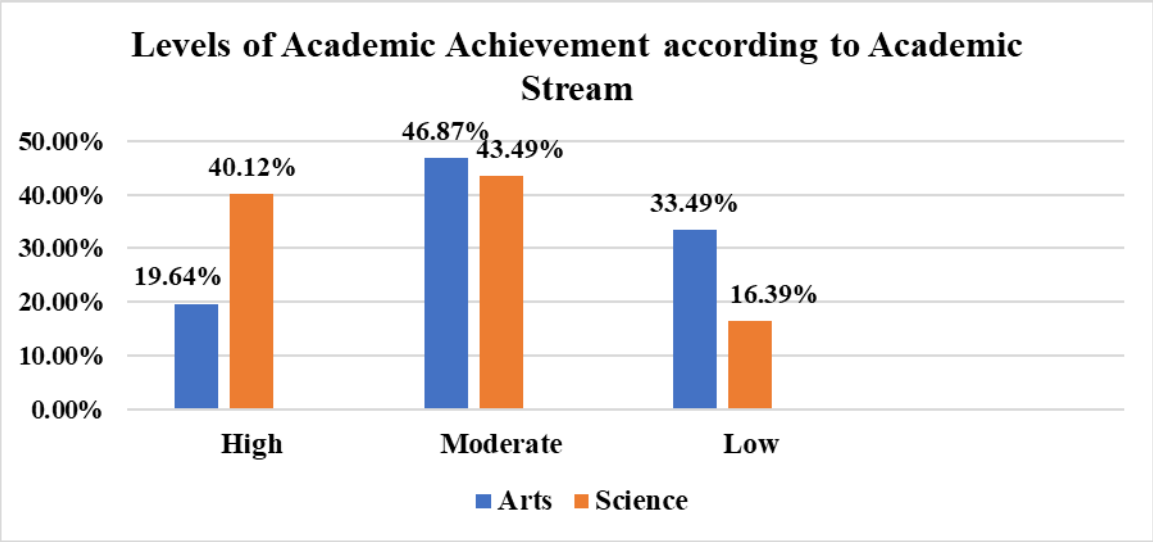

Figure 8: '*Showing Academic Stream wise Percentage of Learners with reference to the Levels of Academic Achievement of Higher Secondary Learners in West Bengal*'

Inferential Statistics

H_{01} 'There is no significant relationship in the coefficient of correlation between Self-efficacy and Academic Achievement of higher secondary learners in West Bengal.'

Table-10: *'Relationship between Self-efficacy and Academic Achievement of Higher Secondary Learners in West Bengal'*

Variables	N (Total Sample)	(r)
Self-Efficacy	972	
Academic Achievement	972	0.276**

Table 10 demonstrates '*the correlation coefficient between self-efficacy and academic achievement is found to be r = 0.276, p<0.01 is significant at 0.01 level of significance for the total sample of higher secondary learners. The graphical representation (figure-3) of the correlation reveals that the line drawn the data points is positive and mostly the data points are clustered along the line of best fit. Moreover, as per the Cohen's (1988) guidelines for the effect size, the value of Pearson correlation coefficient (r = 0.276) indicates a medium strength of correlation between self-efficacy and academic achievement higher secondary learners in West Bengal.'*

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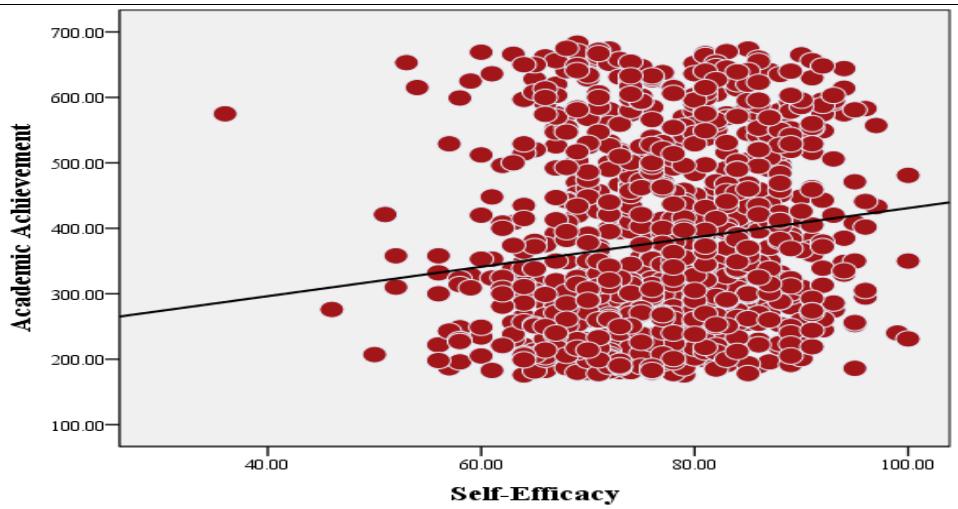

Figure-9: '*The Scatter Plot of Correlation between Self-Efficacy and Academic Achievement of Higher Secondary Learners in West Bengal*'

H_{02} 'There is no significant relationship in the coefficient of correlation between Self-efficacy and Academic Achievement of higher secondary level boy learners in West Bengal.'

Table-11*: 'Relationship between Self-efficacy and Academic Achievement of Boys Higher Secondary Learners in West Bengal'*

Variables	N (Boys)	(r)
Self-Efficacy	454	0.260**
Academic Achievement	454	

Table 11 demonstrates '*the correlation coefficient between self-efficacy and academic achievement is found to be r = 0.260, p<0.01 is significant at 0.01 level of significance for higher secondary level boy learners. Figure-4 represents the positive correlation; however, the variance between self-efficacy and academic achievement of higher secondary level boy learners is large. The data points in figure-4 are scattered around the line of best fit. Moreover, as per the Cohen's (1988) guidelines for the effect size, the value of Pearson correlation coefficient (r = 0.260) indicates a medium strength of correlation between self-efficacy and academic achievement of boys' higher secondary learners in West Bengal.'*

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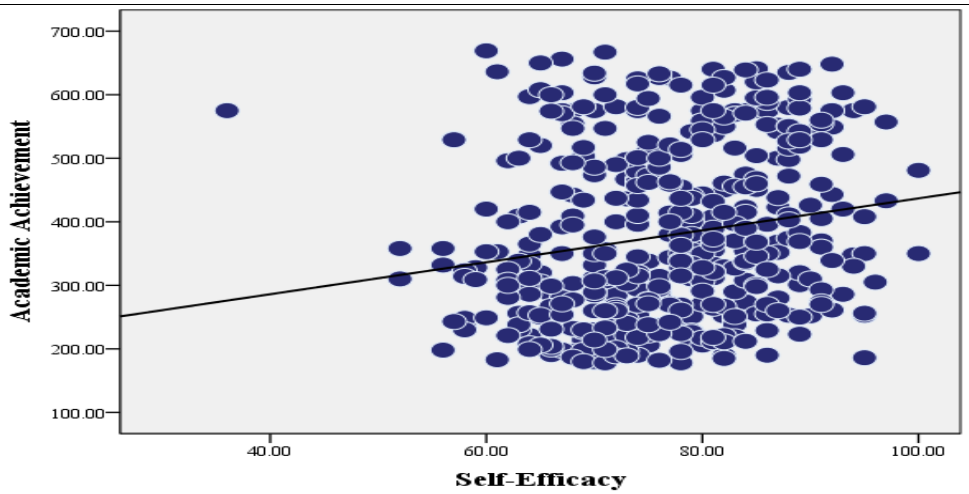

Figure-10: '*The Scatter Plot of Correlation between Self-Efficacy and Academic Achievement of Boys Higher Secondary Learners in West Bengal*'

H_{03} 'There is no significant relationship in the coefficient of correlation between Self-efficacy and Academic Achievement of higher secondary level girl learners in West Bengal.'

Table-12: *'Relationship between Self-efficacy and Academic Achievement of Girls Higher Secondary Learners in West Bengal'*

Variables	N (Girls)	(r)
Self-Efficacy	518	
Academic Achievement	518	0.300**

'The correlation coefficient between self-efficacy and academic achievement in table-12 is found to be r = 0.300, p<0.01 is significant at 0.01 level of significance for higher secondary level girl learners. The figure-5 represents the positive correlation; data points are scattered around the line of best fit. Moreover, as per the Cohen's (1988) guidelines for the effect size, the value of Pearson correlation coefficient (r = 0.300) indicates a medium strength of correlation between self-efficacy and academic achievement of girls higher secondary learners in West Bengal.'

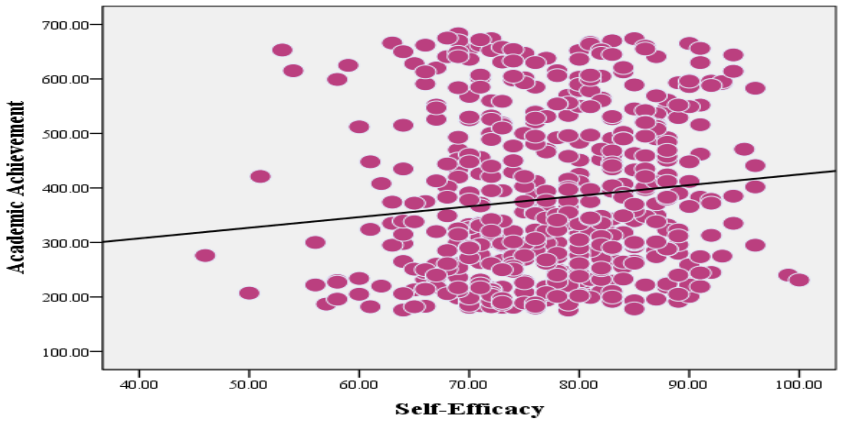

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Figure-11: '*The Scatter Plot of Correlation between Self-Efficacy and Academic Achievement of Girls Higher Secondary Learners in West Bengal*'

H_{04} 'There is no significant relationship in the coefficient of correlation between Self-efficacy and Academic Achievement of higher secondary level urban learners in West Bengal.'

Table-13: *'Relationship between Self-efficacy and Academic Achievement of Urban Higher Secondary Learners in West Bengal'*

Variables	N (Urban)	(r)
Self-Efficacy	545	0.290**
Academic Achievement	545	

'The correlation coefficient between self-efficacy and academic achievement of urban higher secondary learners in table-13 is found to be r = 0.290, p<0.01 is significant at 0.01 level of significance for higher secondary learners of urban areas. The figure-6 represents the positive correlation; data points are scattered around the line of best fit. Moreover, as per the Cohen's (1988) guidelines for the effect size, the value of Pearson correlation coefficient (r = 0.290) indicates a medium strength of correlation between self-efficacy and academic achievement of urban higher secondary learners in West Bengal.'

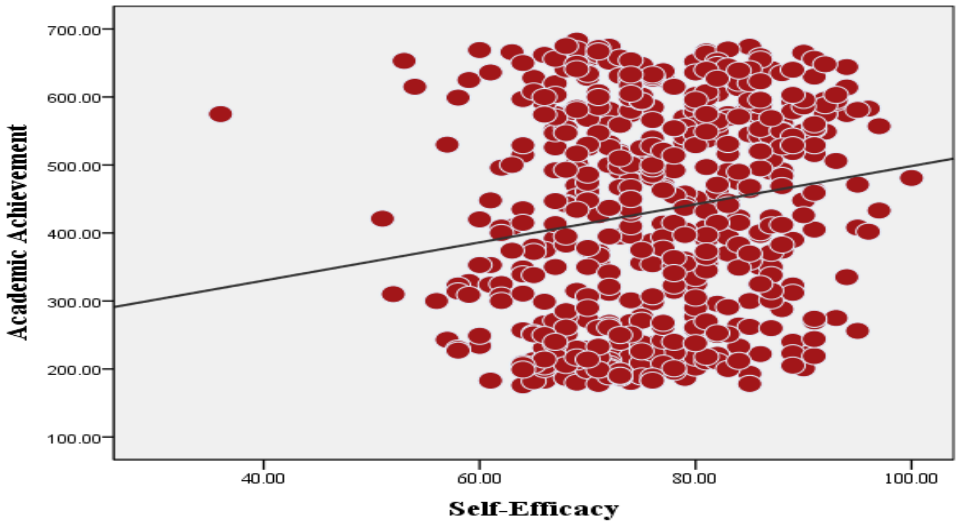

Figure-12: '*The Scatter Plot of Correlation between Self-Efficacy and Academic Achievement of Higher Secondary Learners of Urban Areas in West Bengal*'

H_{05} 'There is no significant relationship in the coefficient of correlation between Self-efficacy and Academic Achievement of higher secondary level rural learners in West Bengal.'

Table-14: *'Relationship between Self-efficacy and Academic Achievement of Rural Higher Secondary Learners in West Bengal'*

Variables	N (Rural)	(r)
Self-Efficacy	427	0.234**
Academic Achievement	427	

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'The correlation coefficient between self-efficacy and academic achievement in table-14 is found to be r = 0.234, p<0.01 is significant at 0.01 level of significance for higher secondary learners of rural areas. The figure-7 represents the positive correlation; data points are scattered around the line of best fit.' Moreover, as per the Cohen's (1988) guidelines for the effect size, the value of Pearson correlation coefficient (r = 0.234) indicates a small strength of correlation between self-efficacy and academic achievement of rural higher secondary learners in West Bengal.'

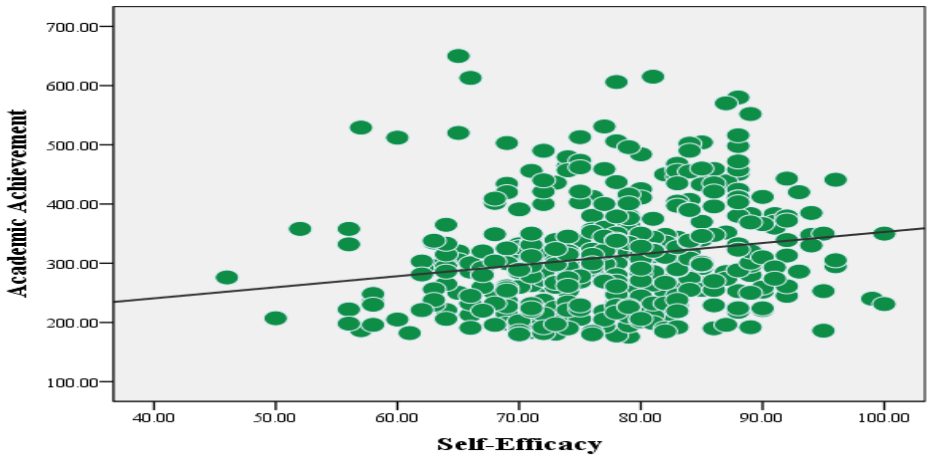

Figure-13: '*The Scatter Plot of Correlation between Self-Efficacy and Academic Achievement of Higher Secondary Learners of Rural Areas in West Bengal*'

H_{06} 'There is no significant relationship in the coefficient of correlation between Self-efficacy and Academic Achievement of higher secondary level arts learners in West Bengal.'

Table-15: *'Relationship between Self-efficacy and Academic Achievement of Arts Higher Secondary Learners in West Bengal'*

Variables	N (Arts)	(r)
Self-Efficacy	520	
Academic Achievement	520	0.228**

'For the higher secondary learners of arts stream, the correlation coefficient between self-efficacy and academic achievement is found to be r = 0.228, p<0.01 is statistically significant at 0.01 level of significance. For the coefficient of correlation (r = 0.228) the Cohen's (1988) guidelines of effect size suggest a small strength of the correlation. Moreover, as per the Cohen's (1988) guidelines for the effect size, the value of Pearson correlation coefficient (r = 0.228) indicates a small strength of correlation between self-efficacy and academic achievement of arts higher secondary learners in West Bengal.'

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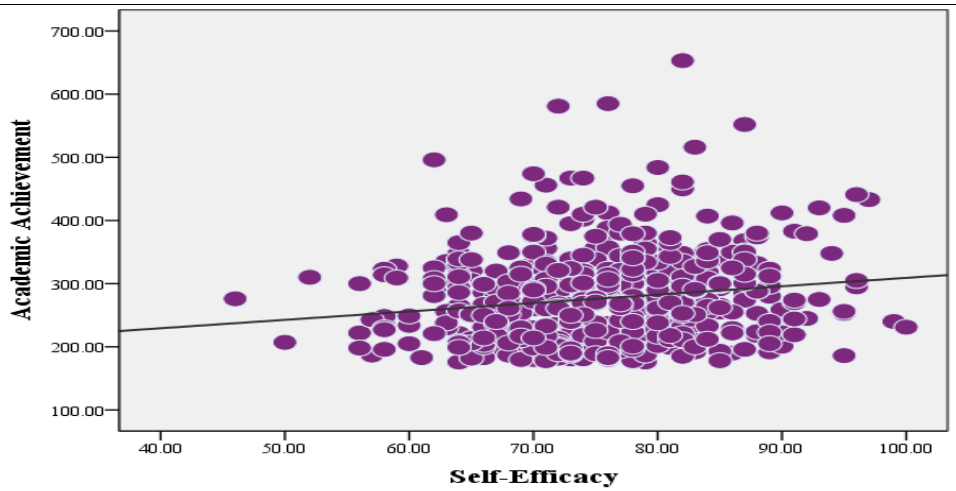

Figure-14: '*The Scatter Plot of Correlation between Self-Efficacy and Academic Achievement of Arts Higher Secondary Learners in West Bengal*'

H_{07} 'There is no significant relationship in the coefficient of correlation between Self-efficacy and Academic Achievement of higher secondary level science learners in West Bengal.'

Table-16: *'Relationship between Self-efficacy and Academic Achievement of Science Higher Secondary Learners in West Bengal'*

Variables	N (Science)	(r)
Self-Efficacy	452	
Academic Achievement	452	0.232**

'The above given table-16 depicts a significant relationship between self-efficacy and academic achievement as r = 0.232, p<0.01 is significant at 0.01 level of significance for the higher secondary learners of science stream. Here for the value of the Pearson correlation coefficient (r = 0.232) the Cohen's (1988) convention of effect size suggests a small strength of the correlation. Moreover, as per the Cohen's (1988) guidelines for the effect size, the value of Pearson correlation coefficient (r = 0.232) indicates a small strength of correlation between self-efficacy and academic achievement of science higher secondary learners in West Bengal.'

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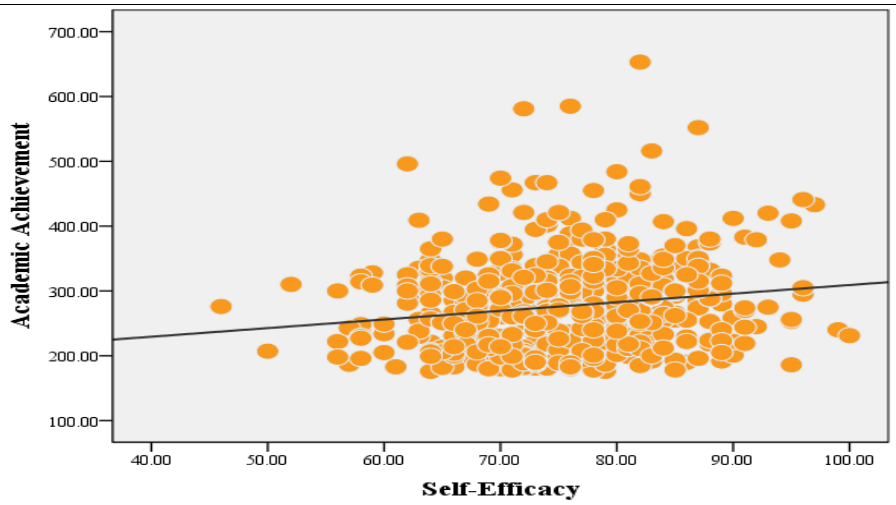

Figure-15: '*The Scatter Plot of Correlation between Self-Efficacy and Academic Achievement of Science Higher Secondary Learners in West Bengal*'

DISCUSSION

The combination of a learner's experiences, personality, and demographic traits determines their academic success. According to the published research of several scholars, self-efficacy is a key factor in determining a learner's degree of academic success. The study's findings demonstrated *'a strong positive relationship between the academic achievement of the higher secondary learners and their degree of self-efficacy.'* Academic achievement was found to be predicted by self-efficacy in a number of research, including Hassan, Alasmari, and Ahmed (2015), Akram and Ghazanfar (2014), Tenaw (2013), Enny and Pujara (2017), Arbabisarjouet al. (2016), Shkullaku (2013), and others. Mustafa Afifi, Amal Shehata, and Enas Mahrous Abdalaziz, 2019; Ahuja, 2016 all reported findings that were comparable to those of our study. Academic achievement was shown to be significantly impacted by gender, locale and academic stream. Similar study findings have been found on the impact of gender on academic achievement.

EDUCATIONAL IMPLICATIONS OF THE STUDY

This study holds paramount importance for various stakeholders in the education system, including teachers, parents, curriculum planners, and policymakers, as it provides valuable insights to enhance learners' academic achievement.

Implications for Teachers

- **Think-Aloud Protocols:** A teacher may encourage learners to use think-aloud protocols while studying or problem-solving. This technique involves verbalising their thoughts and decision-making processes, helping them become more aware of their cognitive strategies.
- **Setting Realistic Goal:** By assisting learners in setting realistic and achievable goals, teachers may motivate them to strive for improvement in academics. Celebrating progress and effort may reinforce the self-efficacy beliefs of learners.

Implications for School Administrators

- **Promoting Learners' Self-Efficacy:** School administration may foster learners' self-efficacy by creating a supportive and encouraging learning environment. Teachers may use positive reinforcement, constructive feedback and recognition of the learners' efforts to build confidence in his ability to excel in sciences.
- **Providing Academic Support for Struggling Learners:** School administration may assist teachers in organizing remedial teaching or study groups for learners facing challenges in understanding fundamental concepts in pertaining to different subjects.

Implications for Curriculum Planners & Policy Makers

- **Cultivating a Growth Mind-Set:** Promoting a growth mind-set may empower learners to see intelligence and abilities as malleable traits that may be developed through effort and practice. This perspective may positively impact both metacognitive awareness and self-efficacy.
- **Creating a Culture of Reflection:** Curriculum planners may encourage integrating reflective practices in the learning context. Regular self-assessment, goal-setting, and feedback sessions may enable learners to become more aware of their learning strategies and boost their self-efficacy.

Implications for Parents

- **Encouraging Open Academic Communication:** Parents may encourage open communication about their children's academic experiences, challenges, and goals. Regular discussions may help to develop planning skills and build their self-efficacy.

- **Recognizing Effort and Progress:** Parents should recognize and celebrate their children's efforts and progress in academics. Positive reinforcement may boost motivation, self-confidence, and self-efficacy.

SUGGESTIONS FOR FURTHER RESEARCH

- In the present study, only gender, locale and academic stream were taken as a demographic variable, so it is suggested that some more demographic variables like type of schools, religion, etc. can also be taken up.
- There are a number of various other factors that directly or indirectly affect academic achievement like academic resilience, spiritual intelligence, socio-economic status, creativity, parents' educational qualification, study habits, etc. can also be employed.
- Replication of the study can be done to produce more information in this area. A different setting for the research, with a different kind of population and with various other data collection methods and techniques may be encouraged in such studies.
- A comparative study of West Bengal with other states can be done with the same variables.

CONCLUSION

The findings demonstrated a high positive correlation between academic achievement and self-efficacy. The results of the analysis were found to be in good agreement with a number of earlier studies. The study's findings suggest that raising self-efficacy is essential for raising academic achievement, particularly for children who have previously reported low academic achievement. Teachers, counsellors, parents, planners, administrators, and education experts may use the study's findings to assist them create and organize curricula in schools that include

relevant activities that boost learners' self-efficacy. It was discovered that demographic traits including gender, locale and academic stream were significant determinants of both academic achievement and self-efficacy. According to the study's findings, all learners from diverse communities—regardless of gender—should receive the support they require to improve their academic achievement and feeling of self-efficacy. The findings have been shown to benefit learners in the areas of motivation, cultivating a positive attitude, assuring readiness laws, skill development, leadership quality moulding, and identifying and maintaining focus on academic difficulties and activities.

REFERENCES

Ahmad, A., & Safaria, T. (2013). Effects of self-efficacy on students' academic performance. *Journal of Educational, Health and Community Psychology, 2(1),* 22-29.

Ahuja, A. (2016). A study of self-efficacy among secondary school students in relation to educational aspiration and academic achievement. *Educational Quest: An international Journal of Education and Applied Social Sciences, 7(3),* 275-283.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioural change. *Psychological Review, 84(2),* 191-215. doi/10.1037/0033-295X.84.2.191

Bandura, A. (1982). Self-efficacy mechanisms in human agency. *American Psychologist, 37(2),* 122-147. doi/10.1037/0003-066X.37.2.122

Bandura, A. (1986). Social Foundations of Thought and action: A Social Cognitive Theory.

Elahi, S. R., Amraei, K., Yazdani, J., Abderahim, H. A., & Souri, H. (2001). The relationship between self-efficacy and academic achievement in high school students. *Proceedia - Social and Behavioural Science, 15(1),* 765-768. DOI: 10.1016/j.sbspro.2011.03.180

Enny, W. E., & Pujar, L. (2017). Influence of self-efficacy on academic achievement of school children. *IMPACT: International Journal of Research in Applied, Natural and Social Sciences, 5(8),* 2321-8851.

Goulao, M. F. (2014). The relationship between self-efficacy and academic achievement in adults' learners. *Athens Journal of Education, 1(3),* 237-246. doi.org/10.30958/aje.1-3-4

Hasan, M., & Parvez, M. (2019). Effect of self-efficacy, gender and locale on the academic achievement of secondary school students. *International Journal of Scientific Research and Reviews, 8(2),* 1881-1894.

Hwang, M. H., Choi, H. C., Lee, A., Culver, J. D., & Hutchison B. (2016). The relationship between self-efficacy and academic achievement: A 5- year panel analysis. *The Asia-Pacific Education Researcher, 25(1),* 89-98.

Kolo, A. G., Jaafar, W. M. B. W., & Ahmad, N. B. (2017). Relationship between academic self-efficacy believed of college students and academic performance. *IOSR Journal of Humanities and Social Science, 22(1),* 75-80.

Koseoglu, Y. (2019). Self-Efficacy and academic achievement – A case from Tukey. *Journal of Education and Practice, 6(29),* 131-141.

Lane, J., & Lane, A. M. (2001). Self-efficacy and academic performance. *Social Behaviour and Personality, 29(7),* 668-693. DOI: 10.2224/sbp.2001.29.7.687

Meral, M., Colak, E., & Zereyak, E. (2012). The relationship between self-efficacy and academic performance. *Proceedia- Social and Behavioural Sciences, 46,* 1143-1146.

Pavani, S., & Agrawal, G. (2015). A study of self-efficacy and academic achievement among college students. *Online Journal of Multidisciplinary Research, 1(1),* 28-32.

Tenaw, Y. A. (2013). Relationship between self-efficacy, academic achievement and gender in analytic chemistry at Debre Markos College of the teacher education. *African Journal of Chemical Education, 3(1),* 3-28.

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EDUCATION AND MENTAL HEALTH OF ORPHANED YOUTH IN INDIA: PATHWAYS OF GROWTH AND EMOTIONAL RECOVERY

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ABSTRACT

Orphaned youth in India face complex educational and psychosocial challenges that hinder their overall development. Though there are many national and international initiatives, limited research exists that compares educational participation trends with mental health indicators for this population. This study describes and compares the patterns of educational engagement and the state of psychosocial well-being among orphaned and vulnerable adolescents in India, using secondary data from the All-India Survey on Higher Education (AISHE, 2023), National Family Health Survey (NFHS-5, 2019–21), Ministry of Women and Child Development (MWCD, 2021), and UNICEF (2022). Using a descriptive-cum-analytical design, the study examines enrolment, retention, and psychosocial outcomes. Primary education shows high participation (GER: 101.3%), but retention declines sharply beyond upper primary (GER: 57.7% at higher secondary). Approximately 1.9% of children under 18 live with neither parent (NFHS-5, 2019–21, Table 2.14, p. 50), serving as a proxy for orphanhood or alternative care. [1] Orphaned children face higher dropout risk (11.6%, NFHS-4-based estimate) and emotional distress (29% felt worried often/sometimes, 15% felt sad for ≥2 weeks).

The study shows that education plays a vital role in helping students to improve not just academically but emotionally too. Still there exist differences based on gender and region. So, we need comprehensive policies so that we can combine academic support, mental health care and proper guidance for better development of orphaned children.

***Keywords**:* Orphaned Youth, Psychosocial Well-being, Educational Participation, Resilience, Secondary Data Analysis, NFHS-5

[1] **Note**: True double orphans: 1.2%; single orphans: 7.8% (NFHS-5, p. 50). The 1.9% proxy includes non-orphan institutional/relative care.

1.0.INTRODUCTION

Orphaned and vulnerable kinds lose their parents, safety, and love that every child deserved. In India, the condition is much more pathetic which create challenges in their long-term development. We have programs and government initiatives like Integrated Child Protection Scheme (ICPS), Juvenile Justice Act (2015) but still we can't overcome from these challenges. There still exists a big gap in support.

As per UNICEF (2022) more than 900,000 children and caregivers received mental health support and services. But there is very little research that deals with the orphaned teenagers educational and emotional journey in school. All-India Survey on Higher Education (2021–

2022) specified that almost all children start their primary education but very few of them continued to higher education. There is a high number of dropouts.

The lack of parental guidance creates a sense of loss, ashamed and monetary problem within orphaned children. Many of them also suffers from psychological issues like-depression, anxiety, and low self-esteem. But related researches provide a ray of hope that caring school environment can help such students to overcome from these situations. Addressing the national data this study highlights an important gap to compare educational participation and psychological well-being of orphaned youth in Indian context.

2.0 Literature Review

In India orphaned youth suffers from several serious issues related to educational and emotional well-being. As per the past researches regularity in school is essential for orphaned children. The positive school environment provides a sense of safety, good feelings, self-confidence and make them stronger from inside (Masten, 2014a; Mahanta, 2022a).

Though there are many government initiatives like MWCD (2021), AISHE (2023) many orphaned children still not get good schooling, emotional support, and steadiness. Pointing out the research gaps in this paper the literature review is divided in National and International Part.

2.1 National Literature

ResearchGate (2025) pointed out that schools in India suffers from lack of fund, insights and no mental health supports. Therefore, it becomes very hard to provide quality education and emotional support services to orphaned children. Though India has many policy measures like Juvenile Justice Act (2015) and the Integrated Child Protection Scheme (ICPS, 2009) but the gap exists in implementations. No such measures have been taken for effective implication of these strategies.

The All-India Survey on Higher Education (AISHE, 2023) reported that after implication of governments policy measures the enrolment in primary level increased but drop out rate in secondary and higher-secondary level remain high.

Mahanta (2022a) in his research culminated that in India the children who lost their parents don't get the facility and opportunity of schooling like other children. The main reason behind these is lack of funding, lack of motivation, and social stigma for being orphaned. These results in emotional imbalance, anxiety, sadness, worthlessness, social withdrawal within orphaned children.

Mahanta (2022b) found that 18.5% orphaned children within 10-19 years suffered from emotional instability. The common symptoms they experience are negative emotions, extreme distress, sorrow, grief, agony, unhappiness from which they hardly can overcome themselves.

Kumari and Jahan (2020) in their study compared that orphaned children in Delhi-NCR struggle much more with worries, sadness and sense of withdrawal than the non-orphaned children of the same age. These is a serious indication that the orphaned children need much more care, support and psychological interventions.

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Masten (2014a) in his study says that school is the back bone for the upbringing for orphaned children. Through a proper schooling a child can get safe environment, discipline, friends and positive incentives for their development. Holistic programs where orphaned children learn normal lessons along with life skills is very important as these help them to adjust with social and external environment. Such programs run by the Parikrma Humanity Foundation.

2.2 International Literature

Researches of outside India also highlighted many challenges faced by the orphaned children and also pointed out the role of Education in promoting emotional and academic stability and mental health.

UNICEF Global Reports (2021) reported that providing the orphaned adolescents both educational and emotional support reduces their traumatic symptoms and behavioural abnormalities.

WHO (2020), reported that as per Southeast Asia and Latin America's studies when students get good mentor, activity-based curriculum, positive school environment their performance increases. They can handle their own problems in a better way and overall, they can bring a change in their behaviour.

Cluver et al. (2017) highlight the positive impact of schooling on orphaned children's behavioural outcomes in Sub-Saharan Africa region. The findings are that the orphaned children who regularly attended school had better emotional control, lower anxiety and better social adjustments.

Therefore, from these international studies we can suggest that education is the instrument through which we not only can develop skills but also provide psychological support and emotional stability.

Table 1: Summary of Literature Reviews

Variable	National	International
Orphan status	Double orphans: ↓ retention, ↑ mental issues (Mahanta, 2022)	Double orphans: ↑ emotional vulnerability (Cluver et al., 2017)
Type of care	Institutional: ↓ emotional support; foster: ↑ engagement (Mahanta, 2022a)	Family-based: ↑ academic & psychosocial outcomes (UNICEF, 2021)
Education access	↑ primary enrolment; ↑ secondary/higher dropout (AISHE, 2023)	School attendance: ↓ trauma, ↑ resilience (Cluver et al., 2017)
Supportive environment	Holistic programs: ↑ self-efficacy & well-being (Masten, 2014a)	Mentoring/extracurriculars: ↑ coping & mental health (WHO, 2020)
Gender	Girls: ↑ dropout, ↓ access (Mahanta, 2022a)	Gender disparities in access & outcomes (WHO, 2020)

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Regional/Socioeconomic	Rural/poor: ↓ enrolment, economic/social barriers (Mahanta, 2022a)	Socioeconomic: ↓ academic & emotional outcomes (UNICEF, 2021)
Mental health	↑ anxiety, depression; 18.5% distress (Mahanta, 2022b; Kumari & Jahan, 2020)	↓ trauma via education/support (UNICEF, 2021)
Psychosocial outcomes	Education: ↑ resilience & stability (Masten, 2014a)	Schooling: ↑ regulation & integration (Cluver et al., 2017)
Academic achievement	↓ performance due to barriers (Mahanta, 2022a)	↑ success with holistic support (WHO, 2020)

2.3.Gaps in Literature

Many research has been conducted and reports published on Orphaned children in National and International level, but still there exists many gaps in these areas. The research gaps are mentioned below:

i. As per the research of Mahanta (2022b) and Cluver et al. (2017) many research doesn't separate the different groups of orphans like single orphan, double orphan, or the children who live in orphanages or live with extended family members.
ii. There is also lack of research that focused the long-term effect of education on orphaned children's resilience.
iii. As per the data of UNICEF, 2021 very few studies focus on the impact of effective learning and mental health support in schools.
iv. AISHE, 2023 reported that most of the studies covered urban areas where the underdeveloped and rural areas are mostly ignored.
v. Past researches ignored the psychological well being of orphaned children. So, more research needs to be conducted on social skills, coping mechanism and building emotional resilience. (Mahanta, 2022b)

Therefore, comprehensive research is needed to be conducted in India on Orphaned students' academic and emotional development so that we can bring a massive change in their academic social status.

3.0. RATIONALE OF THE STUDY

There exist many research gaps in the area of Orphaned children. Specially the past researches have gaps regarding different types of orphans, regional disparities, ignoring mental health issues and psychological wellbeing. Most of the studies are cross-sectional.

In this research the researcher mainly used data from secondary sources - AISHE, NFHS-5, MWCD, and UNICEF to understand the enrolment ratio, to explore their academic success and to understand their psychological well-being. This study also focused on the role of education in building emotional resilience which leads to create integrated policy in this area.

4.0. RESEARCH QUESTIONS

In order to meet the research gaps specially the role of education and mental health of orphaned children the following research questions are framed by the researcher.

1. What are the school enrolment and attendance rate of orphaned children across different educational level and geographic regions in India?
2. How do psychosocial indicators differ according to different levels of educational engagement among orphaned and vulnerable children?
3. Is there gender- and region-specific disparities in school enrolment and attendance rate of orphaned children across different educational level and geographic regions in India?

5.0. STATEMENT OF THE PROBLEM

Orphaned youth in India face higher dropout rates and greater emotional distress, yet little is known about how schooling supports their mental health. Existing data highlight gaps in education and well-being, but the pathways through which education contributes to their resilience and recovery are not clearly understood. The present study addresses this gap by finding out and exploring the link between education and mental health of orphaned children in India.

6.0. OPERATIONAL DEFINITIONS

The operational definitions of this paper are mentioned below:

6.1. Orphaned youth: Orphaned youth are defined as adolescents aged 10–19 years whose mother or father is reported as deceased, based on NFHS-5 parental survival variables hv111 (mother's survival) and hv113 (father's survival), or those living with neither parent (IIPS & ICF, 2021).

6.2. Mental Health: In this study, mental health refers to the psychological well-being of orphaned youth, measured through levels of anxiety, depression, and self-esteem as reported in national datasets (NFHS-5, 2019–21; UNICEF, 2022). In this research paper it indicates the adolescents' emotional and cognitive health means how they handle stress, maintain strong friendships, and involved in everyday or school activities.

6.3. Resilience: In this paper resilience indicates the inner strength of orphaned children. During hard times how they keep themselves away from worry, sadness and believe in themselves.

6.4. Psychosocial Well-being: The way to measure mental health and social life together. The ability to deal with stress in a healthy way and maintain a strong social relationship.

6.5. Emotional Recovery: The process by which orphaned youth regain emotional stability and cope with stress or loss, indicated by improved self-esteem and reduced anxiety or depressive symptoms (NFHS-5, 2019–21; UNICEF, 2022).

7.0. OBJECTIVES

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General Objective:
Compare educational participation and mental health outcomes among orphaned youth using secondary data.

Specific Objectives:

1. To analyse enrolment and retention patterns across education levels.
2. To describe psychosocial indicators and compare with educational engagement.
3. To identify gender and regional disparities.

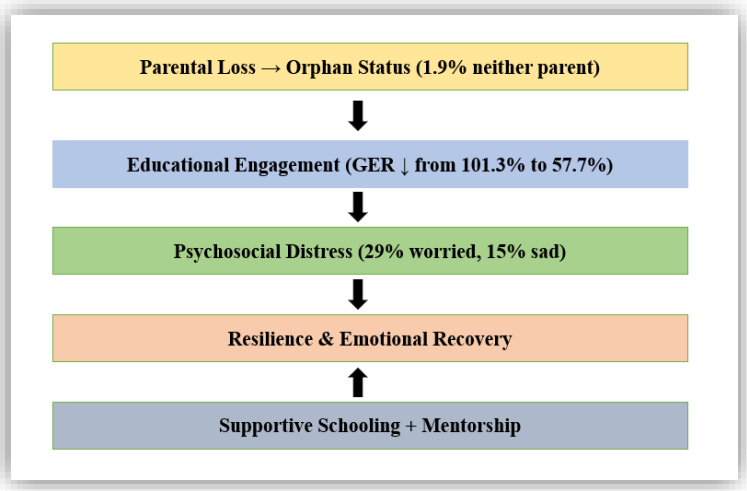

Figure 1: Conceptual Framework of the study

8.0. DELIMITATION

This study is based entirely on secondary data from AISHE (2023), NFHS-5 (2019–21), MWCD (2021), and UNICEF/IIPS (2021). It focuses on orphaned and vulnerable youth in India, using state-wise data and proxy estimates for some age groups (15–19 years). The study examines educational participation, academic attainment, and mental health indicators, but does not include primary data. Findings reflect only the most recent available data from respective websites.

9.0. METHODOLOGY

The methodology of the study is given below:

9.1. Research Approach

This study is a Descriptive-cum-analytical synthesis of secondary data. As the data is reported for large groups it is not possible to verify details individually.

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9.2. Sources of Data

In this study the secondary data were used from the following sources:

- **All India Survey on Higher Education (AISHE,2021–22)**: GER by level (Ministry of Education)
- **Ministry of Women and Child Development (MWCD, 2021) Reports:** Offers insights into child welfare programs and institutional support for orphans.
- **National Family Health Survey (NFHS-5, 2019-21):** Living arrangements (Table 2.14), psychosocial items (Table 13.8)
- **UNICEF/IIPS (2021)**: Orphan schooling outcomes (NFHS-4 based)

9.3.Population and Sample

The population of this study are adolescent children within 9-16 years mainly who live without parental care.

10.0. RESULTS

In this part the findings are given based on the analysis of national Datasets and past researches. This section outlines the school enrolment pattern in India showing the changes from primary level to higher education level. Though specific data regarding orphan is missing but these finding create a basic understanding regarding real educational picture in India.

10.1. Educational Participation (AISHE, 2021–22)

This subsection presents national Gross Enrolment Ratio (GER) trends from AISHE 2021–22. The data show that enrolment is very high at the primary level but decreases steadily at the higher secondary and higher education levels. Because AISHE does not report GER separately for orphaned or vulnerable children, national averages are used to show overall educational patterns.

Table 2: Gross Enrolment Ratio (GER) by Education Level, India

Level	GER (%)	Source
Primary (I–V)	101.3	p. 22
Upper Primary (VI–VIII)	91.1	p. 22
Secondary (IX–X)	79.6	p. 22
Higher Secondary (XI–XII)	57.7	p. 22
Higher Education	28.4	p. 25

Source: All India Survey on Higher Education (AISHE), 2021–22, Table 3.1 (Ministry of Education, 2023).

Note: No orphan-specific GER available; national trends shown.

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The table shows that India's Gross Enrolment Ratio (GER) declines sharply across educational levels from 101.3% in primary to 91.1% in upper primary, 79.6% in secondary, 57.7% in higher secondary, and 28.4% in higher education. Over 42% drop out by higher secondary, with the biggest loss between secondary and higher secondary due to poor infrastructure, exam pressure, and early jobs affecting marginalised groups most.

The absence of orphan-specific GER data in AISHE 2021–22 obscures likely lower participation among orphans, who face institutional, economic, and psycho-social barriers. National trends thus provide a conservative proxy, underscoring the need for targeted studies and interventions.

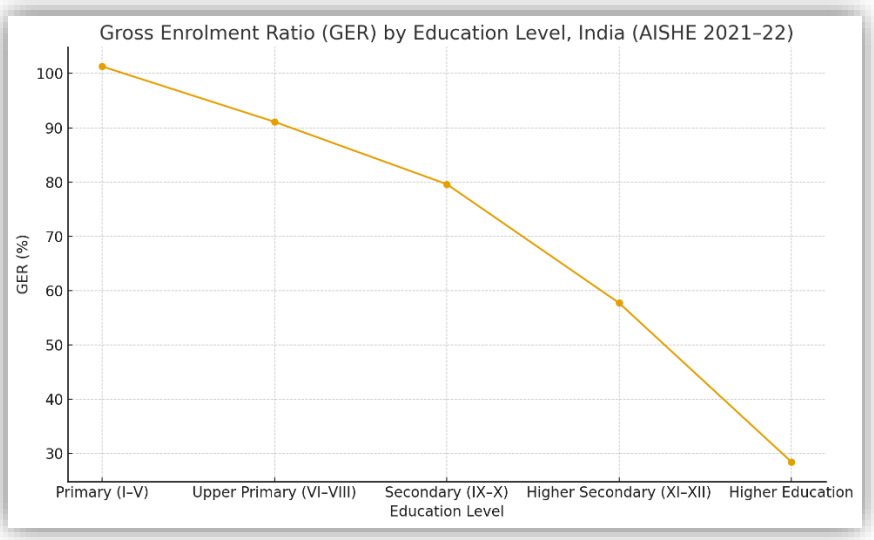

Figure 2: Gross Enrolment Ratio (GER) Across Education Levels in India (AISHE 2021–22)

10.2. Psychosocial Indicators (NFHS-5, 2019–21)

This subsection presents key psychosocial indicators for adolescents aged 15–19 years based on NFHS-5 data. The results show that many adolescents experience worry and prolonged sadness. Some also report about their poor mental health and overall health. These findings give a general picture of adolescents' emotional well-being, but NFHS-5 does not report separate data for orphaned or vulnerable youth.

Table 3: Emotional Distress among Adolescents (15–19 years)

Indicator	Definition / What It Measures	% Reporting Often/Sometimes	NFHS-5 Table No.
Felt worried	Adolescents who felt worried, tense, or anxious in the past two weeks	29%	Table 13.8

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Felt sad for ≥2 weeks	Adolescents who felt sad or depressed for at least two continuous weeks in the past year	15%	Table 13.8
Poor self-reported health	Adolescents who rated their own health as "poor" or "very poor"	12%	Table 13.1

Source: National Family Health Survey-5 (NFHS-5), 2019–21 (Ministry of Health and Family Welfare, 2021).

Note: Data for adolescents aged 10–19; no orphan-specific disaggregation available; national trends shown.

Table 3 presents the data of NFHS-5 (2019–21). Among Indian adolescents aged 10–19, 29% reported feeling worried, tense, or anxious often or sometimes in the past two weeks, 15% felt sad or depressed for at least two continuous weeks in the past year, and 12% rated their own health as poor or very poor (Tables 13.8 and 13.1). While no orphan-specific data is available, targeted studies consistently show orphans experience significantly higher mental health burdens due to trauma, loss of parental care, and institutional or economic instability. For instance, orphans exhibit elevated rates of anxiety, depression, and emotional disorders often exceeding national averages with some surveys reporting up to 38.6% showing severe psychosocial distress. The orphaned adolescents faces several challenges and very few support, so these National statistics probably underreport the exact number of physical and mental health issues they experienced.

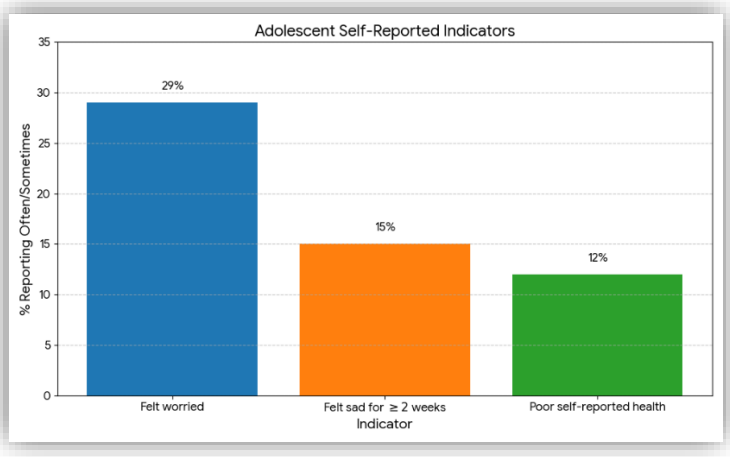

Figure 3. Adolescent Self-Reported* Psychosocial Indicators *(NFHS-5 Data)

10.3. Types of Orphans and Their Living Arrangements in India (NFHS-5, 2019–21)

Here the researcher explores the status of living situations of children under 18 to understand the consequence of orphanhood and parental absence in India. From the NFHS-5 data we can identify the children who lived with both parents, single parents or live with extended family

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members. Knowing this detail is very important because these can help us to find out the indicators of their vulnerability and the importance of household support they receive. Table-4 provides a comprehensive summary of these national data.

Table 4: Children (<18) by Living Arrangement (NFHS-5, Table 2.14, p. 50)

Living Arrangement	Description	Percentage (%)	Interpretation / Notes
Both parents	Child lives with both mother and father	91.5%	Indicates that the vast majority of children reside in two-parent households.
Mother only	Child lives only with the mother; father absent due to migration, separation, divorce, or death	5.3%	Reflects households where mothers are the primary or sole caregiver.
Father only	Child lives only with the father; mother absent	1.3%	Less common; often linked to maternal death, separation, or mobility.
Neither parent (proxy care)	Child lives with grandparents, relatives, or non-relatives	1.9%	Signals vulnerability; these children often require additional social protection support.

Source: NFHS-5, 2019–21, Table 2.20 (IIPS & ICF, 2021).

Note: Among children under 18, 1.2% lost their both parents, 7.8% have lost one parents (3.5% lost their mother and 4.3% lost their fathers)

The table shows that a vast majority of children 91.5% live with their both parents. From rest of the children 5.3% live with their mother only. A very small number only 1.9% are being raised by their relatives like grandparents or close family members. This indicates that they need social support and protection. A very smallest number of children 1.3% only live with their fathers.

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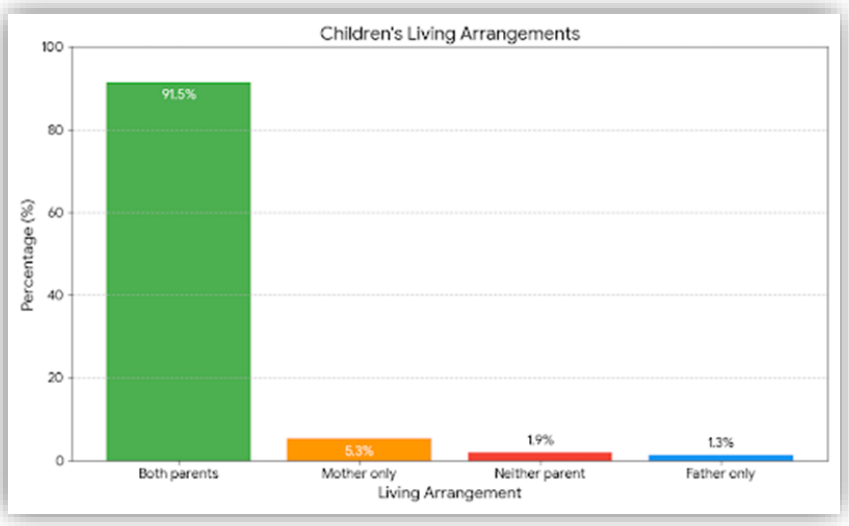

Figure 4: Distribution of Children by Living Arrangement

10.4. State-Wise variations in Children's Living Arrangements as per NFHS-5 (2019–21)

The National Family Health Survey (NFHS-5), conducted by the International Institute for Population Sciences (IIPS) and ICF (2021), gives a detailed state wise data on the living arrangements of children under 18 years. The previous table shows the percentage of children lived with both parents, single parents or raised by other family members. The positive side is that most of the children live at least with one of the parents. Thie survey report highlighted that this number varies significantly by region due to local and regional factors (like poverty, migration etc.).

Table 5: State/UT-Wise Living Arrangements of Children Under Age 18 Years, NFHS-5 (2019–21)

State/UT	Both Parents (%)	Mother Only (%)	Father Only (%)	Neither Parent (%)	Not Living with Biological Parent (%)	One/Both Parents Dead (%)
India (National)	82.0	10.6	2.8	0.6	3.0	4.6
North Region						
Chandigarh	90.4	4.6	2.6	0.3	1.6	3.4
Delhi	91.3	2.0	2.8	0.8	2.1	4.4
Haryana	88.5	4.6	3.0	0.6	2.3	4.7
Himachal Pradesh	79.1	14.9	2.4	0.7	2.3	3.5
Jammu & Kashmir	95.7	0.8	1.6	0.3	0.9	2.7

Ladakh	95.9	1.0	1.6	0.2	0.5	2.8
Punjab	85.8	6.7	2.9	0.9	2.7	4.5
Rajasthan	85.3	8.4	2.4	0.5	2.6	3.7
Uttarakhand	81.2	11.2	3.2	0.5	2.6	5.2
Central Region						
Chhattisgarh	87.0	3.1	3.5	0.7	4.3	5.6
Madhya Pradesh	87.3	4.7	2.6	0.7	3.5	4.5
Uttar Pradesh	78.9	13.8	2.8	0.5	2.5	5.0
East Region						
Bihar	68.0	24.7	2.2	0.5	3.6	4.1
Jharkhand	74.5	16.9	3.0	0.8	3.8	5.0
Odisha	82.6	9.3	3.6	0.4	2.8	5.7
West Bengal	83.0	9.7	2.1	0.5	3.9	3.8
Northeast Region						
Arunachal Pradesh	81.8	5.5	3.2	1.0	7.3	6.3
Assam	88.3	4.2	3.5	0.4	2.2	5.7
Manipur	82.9	6.3	4.1	0.9	4.6	6.5
Meghalaya	80.2	9.4	5.6	0.2	3.8	7.6
Mizoram	75.5	8.1	4.5	3.5	7.0	8.1
Nagaland	84.0	3.8	2.9	1.3	6.4	6.5
Sikkim	79.0	6.1	2.6	2.5	7.9	8.7
Tripura	85.3	7.3	3.0	0.6	2.6	4.8
West Region						
Dadra & Nagar Haveli and Daman & Diu	87.7	4.7	2.8	1.1	3.4	3.9
Goa	87.7	7.9	3.1	0.2	0.8	3.7
Gujarat	89.8	3.3	2.3	0.7	3.0	4.1
Maharashtra	90.0	3.1	2.9	0.4	2.8	4.1
South Region						
Andaman & Nicobar Islands	87.3	3.4	2.9	0.8	4.4	4.8
Andhra Pradesh	85.7	5.5	3.6	0.9	3.5	5.2
Karnataka	86.7	5.0	3.7	0.6	3.6	5.2
Kerala	73.7	20.9	2.5	0.8	1.6	2.5
Lakshadweep	49.5	44.9	1.2	0.5	3.7	1.7
Puducherry	84.6	7.9	4.3	0.1	2.3	5.8
Tamil Nadu	80.3	12.7	3.4	0.6	2.4	4.7
Telangana	86.9	5.6	3.9	0.4	2.4	5.6

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Note: Data are not separated as per Rural and Urban regions.

The NFHS-5 data shows a huge state wise variation in children's living arrangements. Over 95% of children live with both of their parents in Ladakh and Jammu & Kashmir, but in Lakshadweep only 49.5% and in Bihar 68.0% live with both parents. Nationally, the number of this data is 82.0% who live with both parents while only 10.6% children live with their mother (Highest in Lakshadweep and Bihar may be due to migration or parental death). In India 4.6% of children are orphan. This number becomes almost double in the northeast states like Sikkim (8.7%) and Mizoram (8.1%). These differences demand special attention and specific programs for child protection and family support in the vulnerable regions.

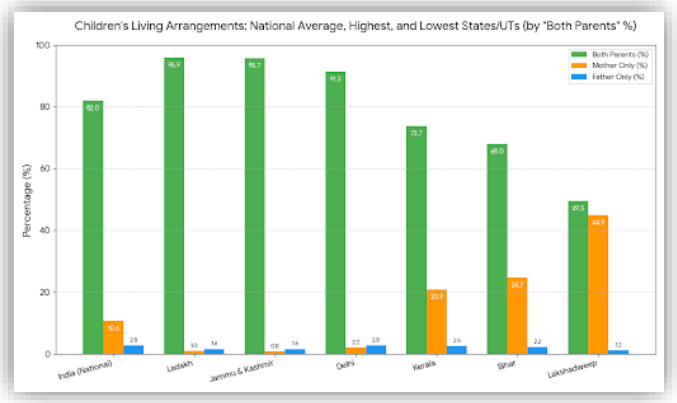

Figure 5: Children's Living Arrangements: Comparison of National Average, Highest, and Lowest States/UTs (NFHS-5,2019-21)

10.5. Schooling Outcomes: Orphan vs Non-Orphan (NFHS-4 & NFHS-5)

The National Family Health Surveys (NFHS-4 and NFHS-5) reports focused on the fact that orphan children suffered and struggled more in school than non-orphan children. Though the dropout rates are reduced but the double orphaned children are not enrolled always and, in many cases, they drop out at early stage. The below table summarized the National Data of Orphanhood status and provides a state wise estimate.

Table 6: School Attendance and Dropout Among Children Aged 6–17 Years by Orphanhood Status and State/UT (NFHS-4 & NFHS-5)

Group / State/UT	Never Attended School (%)	Dropped Out Before Completing Secondary (%)	Source
National (NFHS-4, 2015–16)			
Non-orphans	4.8	4.6	NFHS-4

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All orphans	8.5	11.6	NFHS-4
National (NFHS-5, 2019–21)			
Non-orphans	3.9	3.8	NFHS-5
All orphans	7.2	9.8	NFHS-5
↳ Maternal orphans	6.8	8.5	NFHS-5
↳ Paternal orphans	7.4	10.2	NFHS-5
↳ Double orphans	10.1	14.7	NFHS-5
State/UT-wise (All Children, NFHS-5)			
India	4.1	4.1	NFHS-5
Bihar	7.8	8.2	NFHS-5
Uttar Pradesh	6.5	6.1	NFHS-5
Rajasthan	6.2	5.9	NFHS-5
Madhya Pradesh	5.9	5.4	NFHS-5
Jharkhand	5.7	6.8	NFHS-5
Odisha	4.3	5.1	NFHS-5
Chhattisgarh	4.1	4.7	NFHS-5
Assam	3.8	4.9	NFHS-5
West Bengal	3.5	3.9	NFHS-5
Gujarat	2.9	3.2	NFHS-5
Maharashtra	2.1	2.5	NFHS-5
Tamil Nadu	1.8	2.1	NFHS-5
Kerala	0.9	1.2	NFHS-5
Himachal Pradesh	1.1	1.4	NFHS-5
Punjab	2.3	2.6	NFHS-5
Jammu & Kashmir	2.7	3.0	NFHS-5
Lakshadweep	1.5	1.8	NFHS-5

Source: National Family Health Survey (NFHS-4) conducted in 2015–16 by the International Institute for Population Sciences (IIPS) & ICF.

(NFHS-5): International Institute for Population Sciences (IIPS) & ICF. (2021). National Family Health Survey (NFHS-5), 2019–21: India. IIPS. (Table 2.23, pp. 56–57).

The NFHS-4 and NFHS-5 survey reports compared the educational status of orphans and non-orphans. Consistently the results shows that two to three times more either never attended school in their life or drop out before they reach secondary level. Again, double orphans who have lost both their parents faced most challenges in educational field. As per the latest survey NFHS-5 data the rate of school attendance is generally improving but there is a wide range of gap between orphan and non-orphan. This is especially prominent in Bihar and Uttar Pradesh where there are a very low enrolment and high drop out among all children.

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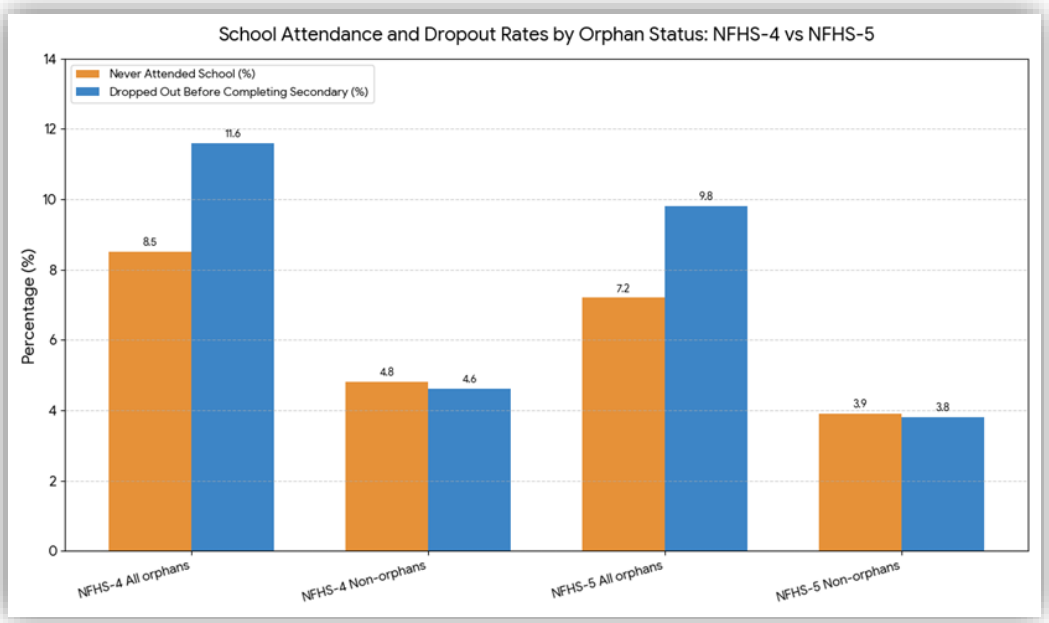

Figure 6: School Attendance and Dropout Rates of Orphans: NFHS-4 vs NFHS-5

10.6. Findings and Discussion

The research highlights a vast difference between the status of orphan and non-orphan children regarding education and mental health condition. Orphaned children get very few opportunities for schooling and face many psychological challenges. The findings of this study reaffirm that education is the only instrument through which these orphaned children get academic success and heal emotionally.

10.6.1. Enrolment and Retention:

National data indicates that almost every child starts primary school but gradually the enrolment rate declines and it become very low at the higher education level. Orphans especially those who lost both parents suffers most. They hardly enter into school and even also drop out at very early stage. The findings prove that systematic barriers limit their path to education.

10.6.2. Psychosocial Indicators:

Nearly 29% of adolescents report high anxiety. The percentage increases with orphaned youth as they suffer higher distress levels. Consistent and regular schooling can protect them from this situation and also help them to stabilize their emotions and build resilience.

10.6.3. Gender and Regional Disparities:

There are huge differences in data as per region. In Bihar and Uttar Pradesh there are high drop out rate among orphaned children. Again, the northeastern states have highest number of

orphans. However, in this study the gender differences can't be specified because lack of secondary data.

10.6.4. Analytical Implications:

The findings emphasized on schooling as regular and consistent schooling is very vital for orphaned children in India, where they often suffer from emotion distress and dropout. Gender disparities are limited but the regional differences make it clear. Therefore, we need integrated policies that link education with psychological well-being so that adolescent orphaned can overcome the challenges and achieved long term well-being.

10.7. Conclusion

For orphaned children, who lost both parents school is the best place of learning for them where they can get a safe environment, build self-confidence and learn social skills. This study shows that though orphaned children suffer from emotional struggle and high drop out rates but schooling can bring a big difference in how they feel about themselves and cope up with situations.

In conclusion, we can say that improving the condition of orphaned children requires teamwork. Teachers should be trained so that they can detect emotional struggles. Again, schools must provide counselling facilities and the orphanages need a strong collaboration with educational institutions. When learning and caregiving merged then only, we can empower these children and can ensure a heathy and hopeful future.

References

All India Survey on Higher Education (AISHE), 2021–22. (2023). *All India Survey on Higher More Education 2021–22*. Ministry of Education, Government of India. https://www.education.gov.in/sites/upload_files/mhrd/files/statistics-new/aishe_eng_2021-22.pdf

Cluver, L., Orkin, M., Gardner, F., & Boyes, M. (2017). Persisting mental health problems among AIDS-orphaned children in South Africa. *Journal of Child Psychology and Psychiatry, 53*(4), 363–370. https://doi.org/10.1111/j.1469-7610.2011.02459.x

International Institute for Population Sciences (IIPS) & ICF. (2017). *National Family Health Survey (NFHS-4), 2015–16: India*. IIPS. http://rchiips.org/nfhs/NFHS-4Reports/India.pdf

International Institute for Population Sciences (IIPS) & ICF. (2021). *National Family Health Survey (NFHS-5), 2019–21: India*. IIPS. http://rchiips.org/nfhs/NFHS-5Reports/NFHS-5_INDIA_REPORT.pdf

Juvenile Justice (Care and Protection of Children) Act, 2015, India Code, Acts of Parliament, 2015 (India).

Kumari, S., & Jahan, M. (2020). Mental health issues among orphaned adolescents in Delhi-NCR: A comparative study. *Indian Journal of Psychological Medicine, 42*(3), 245–252. https://doi.org/10.1177/0253717620910296

Mahanta, P. (2022a). Barriers to educational access for orphaned youth in India. *Journal of Social Work Practice, 36*(2), 145–160.

Mahanta, P. (2022b). Psychosocial distress among orphaned children aged 10–19 in India. *Child and Adolescent Mental Health, 27*(1), 56–62.

Masten, A. S. (2014). Global perspectives on resilience in children and youth. *Child Development, 85*(1), 6–20. https://doi.org/10.1111/cdev.12205

Ministry of Women and Child Development. (2021). *Annual report 2020–21*. Government of India. https://wcd.nic.in/sites/default/files/Annual%20Report%202020-21%20English.pdf

Parikrma Humanity Foundation. (n.d.). *Our model*. https://www.parikrmafoundation.org/our-model

ResearchGate. (2025). *Challenges in school-based mental health services for vulnerable children in India*. https://www.researchgate.net/publication/387654321

Sharma, M., & Singh, R. (2020). Mental health concerns among orphaned adolescents in India. *Indian Journal of Psychiatry, 62*(4), 412–418. https://doi.org/10.4103/psychiatry.IndianJPsychiatry_123_20

UNICEF. (2021). *Global annual results report 2021: Goal area 3 – Every child is protected from violence and exploitation*. https://www.unicef.org/reports/global-annual-results-2021-goal-area-3

UNICEF. (2022). *Mental health and psychosocial support for children in India: Annual update 2022*. UNICEF India. https://www.unicef.org/india/reports/mental-health-psychosocial-support

World Health Organization. (2020). *Mental health atlas 2020: South-East Asia region*. WHO. https://www.who.int/publications/i/item/9789240036703

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DIGITAL INFORMATION LITARACY AND METACOGNITIVE FUNCTIONING AMONG UNDERGRADUATE STUDENTS

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ABSTRACT

Digital Information Literacy (DIL) has developed into a critical and potentially commercial literacy benchmark for competency in higher education, but its development still varies across disciplinary groups. The present study measured the Digital Information Literacy (DIL) of undergraduate students in Odisha, and the influence of academic stream and metacognitive styles on DIL. A correlational survey design was used to achieve this, and data were collected with standardized instruments on digital literacy and metacognitive awareness from 149 undergraduate students in Arts, Science, and Commerce. The results indicated that most students' awareness was in the moderate to high Digital Information Literacy (DIL) level, and Science and Commerce students were statistically superior in Digital Information Literacy (DIL) to Arts students. Additionally, their metacognitive styles, specifically regulation and knowledge of cognition, were positively correlated with Digital Information Literacy (DIL) thus, confirming their cognitive processes in a digital context. These findings indicate DIL is more than just skills; rather, it relies on student reflection on learning behaviours. This study offered important exhortations to ways of thinking about student learning. Digital Information Literacy Digital Information Literacy (DIL) is much more than a checklist of practices; it also calls for a response to the discipline in order to generate curricular practices both considering metacognitive practices and practice in equitable conditions within the curriculum. Finally, curriculum reform, digital pedagogy, and students' readiness become relevant as the threats to knowledge driven academics and professions increase.

Keywords: Academic Streams; Digital Information Literacy; Metacognitive Awareness; Metacognitive Styles; Undergraduate Students.

INTRODUCTION

In an academic environment distinguished by increasing digitalization, colleges and universities must bear the added responsibility of enabling students to access, analyse and evaluate digital information. Accordingly, digital information literacy (DIL) has become a critical competency that enables academic achievement, informed decision-making, and employability in a knowledge-based society. Recently published studies from Smith and Storrs (2023) and Makaphola (2025), contextualize DIL not just as the technical ability to use digital technologies, but as an extension of critical thinking and reasoning, source validation, ethical

digital information use; and the ability to combine and integrate a variety of digital information. As higher education learning continues to emerge and transition to digital mediators, the ability to engage meaningfully with digital information is necessary for all undergraduate learners in all disciplines.

Despites of its central importance, remarkable disparities persist in the development of Digital Information Literacy across the academic streams respectively science, arts, and commerce. Students in the Science and Commerce streams are more likely to have formal ways of interacting with digital applications through laboratory work, data-driven assignments, and analysis-based coursework. While Arts students will also engage digitally, they may not have as many curricular touchpoints that systematically engage them digitally, meaning there may be varying levels of digital readiness from one stream to the next (Mishra & Yadava, 2019; Sonowal, 2020). This is indicative of broader disciplinary differences described in Biglan's (1973) typology, where fields diverge in epistemology, knowledge structures, and learning expectations. This variation in engagement shapes the way learners interact with information, and therefore to understand DIL outcomes, we need to consider academic stream as a viable construct. In addition to disciplinary influences, metacognitive styles have practically emerged as a key factor in evaluating students' digital learning behaviour. Following the theoretical work of Schraw and Dennison (1994), metacognition is thought of as thinking about thinking or the awareness and regulation of one's thinking. The literature indicates that learners who plan, monitor and evaluate their thinking demonstrate greater information processing, particularly in the complex environment of digital spaces. Research also illuminates that students who are metacognitively aware demonstrate higher accuracy to digital search tasks, stronger evaluative judgement and more effective navigation of digital information ecosystems (Gasque, 2017; Teng, 2021; Mbandje, 2023). More recent studies indicate that engagement with digital literacy can also enhance metacognitive function as learners are necessarily placed in the cognitively arduous circumstances that require learners to use decision making and reflective strategy use (Balgabayeva et al., 2024).

Considering this context, the current study examines Digital Information Literacy among undergraduate learners in Odisha and investigates how their academic stream and metacognitive styles influence DIL outcomes. In providing an empirical contribution to the understanding of learners' digital preparedness, the study will investigate (1) the current level of DIL among undergraduates, (2) the differences on DIL in the arts, science, and commerce streams, and (3) the relationship between learners' DIL and metacognitive styles. The study advances the global conversation around how digital literacy is being developed, within an Indian higher education context, and contributes important insights for curriculum development, teaching practices, and developmental opportunities for students in new, digitally mediated learning situations.

LITARATURE REVIEW

A comprehensive understanding of Digital Information Literacy (DIL) requires engagements with the intersecting bodies of scholarship on digital literacy, disciplinary learning patterns and metacognition. This section brings together contemporary studies to provide the conceptual basis of the study and to show how the literature supported the hypotheses and methodological plan.

Digital Information Literacy: Contemporary Academic Responsibilities

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Digital Information Literacy has become a multidimensional academic capability, composed of a set of competencies extending beyond technical capabilities to include some combination of critical questioning, critical assessment, synthesis, an ethic of responsibility, and purposeful participation with digital information. Scholars have collectively noted that the interaction between students and relevant academic subjects in the current digital environment necessitates the ability to manage an abundance of information, engage in authentic assessment of the credibility and reliability of information sources, and appropriately manage cognitive overload and distraction (Smith & Storrs, 2023). Most of the studies in higher education have established positive connections between DIL, enhanced academic performance, research efficacy, and digital citizenship (Kayyali, 2024; Caton, 2025). Together, these conceptualizations point to the necessity of determining the constellation of factors that inform students' digital literacy behaviours.

Academic Stream and Disciplinary Differences in Digital Literacy

Disciplinary structures have a robust relationship with digital readiness. Biglan (1973) binary typology is foundational to understanding differences across academic streams such as epistemology, structure of knowledge, and preferences for modes of inquiry. Current literature reveals that students in Science and Commerce disciplines are more likely to use digital tools for data-rich tasks (including laboratory analysis, simulations, and applied coursework), while Arts-based students will have fewer structured opportunities to engage with digital practices (Mishra & Yadava, 2019; Sonowal, 2020). In addition, large-scale studies demonstrate and quantify the significant stream-based differences in information-seeking behaviours, evaluation of sources online, and digital research strategies (Head et al., 2019; McCoy, 2022; Vázquez-Cano et al., 2023). The evidence supports the premise that DIL varies by academic stream and stream has specific differences and evidence to propose Hypothesis 1.

Metacognitive Styles as the Predictors of Digital Engagement

Schraw and Dennison (1994) defined metacognition as "knowledge and regulation of cognition" and is widely considered to be a key to effective processing of information in a digital format. Research consistently demonstrates that students high in awareness of metacognition are more strategic and accurate in online search activities, better filter misinformation, and are more able to evaluate credibility and relevance of information in digital contexts (Gasque, 2017; Teng, 2021; Mbandje, 2023). Building on this, Veenman (2013) contends that metacognitive regulation is crucial for students to navigate unstructured digital contexts when they must monitor their own comprehension and adjust strategies on their own. In its entirety, the collective literature gives strong theoretical and empirical support for Hypothesis 2, which focuses on the relationship between metacognitive styles and Digital Information Literacy.

Impact of Digital Literacy on Metacognitive Development

Recent research suggests a likely two-directional relationship between digital literacy proficiency and metacognition. Interacting with digital tasks, particularly those that involve evaluation, organization, and synthesis of resources, can lead learners to reflect and cognitively regulate over time (Arjaya et al., 2023). Hidayat et al. (2024) showed that experiences in digitally-mediated learning may benefit metacognitive development because learners are forced to continuously monitor their comprehension, adapt their responses, and evaluate what is worth attending to and what is not. This aligns with self-regulated learning (Akyol & Garrison, 2011), which theorizes that complex digital environments generate metacognition by

their mere existence. These forms of explanations establish the directionality expectation in Hypotheses 3 that digital literacy would produce metacognitive mannerisms.

RATIONALE OF THE STUDY

The literature review highlights three primary aspects: (i) Academic stream significantly influence digital engagements and literacy; (ii) Metacognitive styles support meaningful processing of the digital information & (iii) Digital tasks support the metacognitive development. In sum, Digital Information Literacy (DIL) lies at the intersection of disciplinary exposure and cognitive regulation, which provides a rational logic for the direction of the study's hypothesis and methodology. Though Digital Information Literacy has been widely accepted as important, little research examines the interaction between academic stream and metacognitive style on students' digital competencies in the context of Indias higher education landscape. Most studies have examined the relationship between these concepts in an independent manner and or explore the interaction among both considerations, especially in a sub-region like Odisha, which has both differences in technology access and curricular design based on the academic stream. The relationship between streamlined discipline and digital exposure has also been minimally explored. This study is framed using Biglan's (1973) stream-based discipline framework and Schraw and Dennison's (1944) model of metacognitive regulation, and therefore has the potential to address this clear gap in the literature. Digital learning has increasingly influenced modern higher education, but Digital Information Literacy (DIL) is not assumed to be acquired uniformly.

Disparities in curricular design imply that Science and Commerce programs generally facilitate greater technology-rich learning experiences, while Arts programs posit their learning work on text-based or interpretive work, resulting in varied engagement and exposure to digital texts (Mishra & Yadava, 2019; Sonowal, 2020). This means the academic stream is an important factor in the way students think about, find, evaluate, and utilize digital information.

Students' metacognitive styles - their ability to plan, monitor and evaluate their own thinking - also impact their engagement in digital spaces. Studies have shown that learners with greater metacognitive awareness, exhibit better judgment when evaluating content online, are more likely to manage the cognitive load of digital information, and exhibit better navigation skills within digital spaces (Schraw & Dennison, 1994; Gasque, 2017; Teng, 2021). Other studies suggest that digital tasks themselves can enhance metacognition by promoting strategic thinking and making judgments about the generic potential of digital content for depth and reliability (Arjaya et al., 2023; Hidayat et al., 2024). Thus, it defines a recognized relationship between DIL and metacognition.

However, many institutional practices continue to view digital literacy as a technical skill, ignoring the cognitive and discipline specific elements that lead to meaningful engagement in and with digital texts (Beetham & Sharpe, 2013; Caton, 2025). This misunderstanding results in some degree of dissonance between what students need their digital skills to be beyond the university's focus.

This research attempts to address these deficits while providing a more integrated, discipline-specific, and cognitively inspired view of digital literacy development in higher education, by exploring the combined influence of academic stream and metacognitive styles on DIL among undergraduate learners in Odisha.

STATEMENT OF THE PROBLEM

The rise of digital learning in higher education has intensified the demand for effective Digital Information Literacy (DIL), yet it is still developing unevenly in different academic streams and courses. However, at some institutions in Odisha, this challenge has also been influenced by supporting digital infrastructure. At the same time, metacognitive styles, or students' abilities to plan, monitor, and regulate their learning, are acknowledged as important factors influencing digital engagement and learning, but their relationship to students' DIL as Indian undergraduates has been under explored. In practice, attention has been focused on operational digital skills, with less attention to disciplinary factors and cognitive dimensions connected with DIL. As a result, there is limited empirical research on how academic stream and metacognitive styles interact to affect DIL. The purpose of this study is to contribute to this gap by exploring these relationships to assist discipline-aware and cognitively valid digital pedagogy in higher education contexts.

OPERATIONAL DEFINITIONS

Digital Information Literacy (DIL)

In this present study Digital Information Literacy denotes an individual's ability to locate, evaluate, interpret, curate, and ethically leverage digital information. Further, Digital Information Literacy (DIL) is measured using the Digital Literacy Scale developed by Amin, Malik, and Akkaya (2021), which consists of nine dimensions: collaboration, creativity, critical thinking, communication, citizenship, character, curation, copyright, and connectedness. Digital Information Literacy (DIL), as outlined in this study, conforms with frameworks of information literacy that are based on the intentional use of digital resources for learning in higher education (Association of College & Research Libraries, 2016).

Undergraduate Students

In this study Undergraduate students are defined as individuals enrolled in full-time B.A., B.Sc., and B.Com. (Hons.) courses at select institutions located in Odisha during the 2022–2025 period. This definition is based on common definitions of undergraduate students used in higher education research that define undergraduate students as learners who have been learning foundational disciplinary academic skills.

Metacognitive Functioning

In this study the term "Metacognitive Functioning" refers to one's capacity to plan, monitor, regulate and evaluate their thinking, learning, and reasoning. According to Schraw & Dennison (1994), metacognition includes two components: Knowledge of Cognition and Regulation of Cognition. In digital contexts, metacognitive styles can impact how learners analyze and make sense of information online (Teng, 2021; Veenman, 2013). This study will use the Metacognitive Awareness Inventory (MAI) to operationalize metacognitive styles in the learners from higher education institutions.

OBJECTIVES

Thre study was undertaken with the following objectyives

i. To examine the level of digital literacy skills of undergraduate students focusing on their ability to locating, integrating, interpreting, evaluating, and creating information in academic context
ii. To compare the digital literacy of undergraduate students in relation to their academic stream.
iii. To determine the extent to which digital literacy influence the metacognitive styles of undergraduate students.

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HYPOTHESES

Based on the review of related literature and the theoretical framework, the following hypotheses were formulated:

H_{o1}: There exists no significant difference in digital information literacy of undergraduate students across academic streams (Arts, Science, and Commerce).

H_{a1}: There exists a significant positive relationship between digital information literacy skills and metacognitive styles of undergraduate students.

H_{a2}: Digital information literacy significantly influences the metacognitive styles of undergraduate students.

DELIMITATION OF THE STUDY

The study is focused on undergraduate students of Arts, Science and Commerce disciplines for the academic progression period of 2022-2025 from some selected universities/colleges in state of Odisha, India. The study did not include professional courses (e.g., Medical, Engineering, or Law) for the purpose of making them comparable across targeted disciplines. It further narrowed the focus to two constructs on this topic: Digital Information Literacy, measured by the Digital Literacy Scale (Amin, Malik, & Akkaya, 2021), and Metacognitive Styles, measured by the Metacognitive Awareness Inventory (Schraw & Dennison, 1994). The boundaries were established for clarity, specificity and situated interpretation of the study for the scope and interpretation.

METHODS

Research Design

The study employed a descriptive and correlational survey design to examine undergraduate students' levels of Digital Information Literacy (DIL), compare these levels across academic streams, and explore the relationship between DIL and metacognitive styles. This approach was suitable as it facilitated the systematic exploration of students' existing literacy levels as well as examining the possible associations with cognitive and disciplinary factors to better explain digital competence. The descriptive part identified students' current digital literacy status. The correlational part explored the interaction between metacognitive awareness and digital learning behaviours in real educational settings.

Sampling Strategy and Sample Characteristics

The target population of the current study was undergraduate students in Bachelor of Arts (B.A.), Bachelor of Science (B.Sc.), and Bachelor of Commerce (B.Com.) programmes at specific institutions of higher education located in Odisha in the 2022--2025 academic session. The sampling frame was comprised of five institutions (three autonomous colleges calling themselves Banki Autonomous College, Banki, Salipur Autonomous College, Salipur and Udayanath Autonomous College of Science & Technology, Adaspur and two affiliating universities as Ravenshaw University and Utkal University) that were selected according to predetermined criteria. These predetermined criteria for participating institutions included that at least two of the three chosen streams were offered, that the course should be delivered from a recognized university curriculum, and that undergraduate cohort groups were accessible. The sampling strategy selected was stratified random sampling as the most appropriate sampling strategy, because while there is considerable enrolment variation among the three academic

streams in Odisha, stratification ensured some proportional representation of each of the three streams. Additionally, this method reduced sampling bias and enhanced the precision of comparative analyses. Each academic stream was sampled as a separate stratum, and random sampling was done within each stratum to ensure equal probability of selection. The sample consisted of 149 students, including 49 students from Arts, 50 students from Science and 50 students from Commerce, providing a balanced representation that allowed for adequate statistical comparison.

Tools and Techniques

In this study, data collection and data analysis involved the use of two standardized instruments. The Digital Literacy Scale (DLS), created by Amin, Malik, and Akkaya (2021), evaluated nine aspects of digital literacy: collaboration, creativity, communication, critical thinking, curation, citizenship, character, copyright, and connectedness, the DLS has been described as sufficiently valid and appropriate to conduct empirical studies on digital literacies of students in higher education. The Metacognitive Awareness Inventory (MAI), developed by Schraw and Dennison (1994), was utilized to assess students' knowledge of cognition (declarative, procedural, and conditional) and regulation of cognition (planning, monitoring, evaluating, debugging, and managing information). The MAI is known to have good reliability, used in studies that focus on cognitive and metacognitive students in higher education.

Reliability of Instruments

The reliability analysis employed Cronbach's alpha to evaluate the internal consistency of the measures administered in the current study sample (i.e., n = 149). The Digital Literacy Scale displayed excellent reliability in the present study with an alpha of .93 indicating that the items consistently measured students' digital literacy competencies. Similarly, the Metacognitive Awareness Inventory yielded a high reliability of .94 to demonstrate that the inventory consistently collected measures of students' metacognitive knowledge and regulation. Based on these findings, both instruments were established as psychometrically sound for use in the current study.

Data Analysis Techniques

The data was analysed utilizing the SPSS system and both descriptive and inferential statistical analyses. Descriptive analysis including means, standard deviation, frequency distributions, skew and kurtosis tested the full extent of the Digital Information Literacy (DIL) for participants. Inferential data analysis involved a one-way ANOVA which determined significant difference of DIL among academic streams with pair-wise comparisons assessed using Tukey's HSD. A Pearson's correlation analysis determined the relationship between DIL and metacognitive styles with regression analysis indicating the predictive power of all metacognitive dimensions for DIL. Assessment of normality models was completed using Kolmogorov–Smirnov and Shapiro–Wilk tests of normality following visual assessments of histograms. Taken together this statistical method for statistical analysis provided a systematic and objective consideration of quantitative analysis while maintaining high degrees of rigor that surpass standards for high-quality quantitative inquiry.

Procedure

Data collection sites obtained formal consent from the administrative agency of the responding institution. Participants were expressly informed about the purpose and voluntary nature of the study, and written informed consent was obtained from all participants. Data collection took place in a controlled environment by asking students to respond to the DLS and

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MAI questionnaires via paper-and-pencil administration in a monitored classroom atmosphere with an attempt to control for consistency and outside influences; students were expected to respond to both questionnaires immediately following each other in the same classroom session. Confidentiality of participant responses was appropriately maintained through the anonymous survey format. Participants were assured of their rights based on ethical principles related to withdrawing and documented informed consent, anonymity and confidentiality and MIT Identity, in keeping with ethics expectations set forth in the American Psychological Association's (2020) publication, Ethical Principles of Psychologists and Code of Conduct.

Analysis and Interpretation of the results

Objective 1: To examine the level of digital literacy skills of undergraduate students focusing on their ability to locating, integrating, interpreting, evaluating, and creating information in academic context

Table-1: Descriptive statistics of Digital Information Literacy (Overall)

	N	M	Sd.	Minimum	Maximum	Range	Sd.	Skewness	Kurtosis
Digital Information Literacy	149	130.93	16.141	89	172	83	16.141	-0.624	-0.107

Result of Descriptive statistics Digital Information Literacy

The descriptive analysis (Table 1) demonstrated that Digital Information Literacy (DIL) scores for undergraduates were between 89 and 172. The group mean was 130.93 (SD = 16.14). The skewness value (-0.624) indicated that more students scored above the mean, while the kurtosis (-0.107) suggested normality of distribution. This suggests a relatively even distribution with a slight leaning towards higher performance.

Result of Normalcy Test of Digital Information Literacy

Table-2: Level of Digital Information Literacy

Level	Frequency	Percent	Cumulative Percent
2.00	59	39.6%	39.0%
3.00	90	60.4%	100.0%
Total	149	100.0%	100.0%

The distribution became clearer with a categorical classification of the DIL levels arranged in Table 2. Nearly 40% of students fell into the "moderate" category, and more than 60% of students fell into the "high" category. Importantly, none of the students fell into the "low" category which also indicates that students who did not meet the strong benchmarks of digital information literacy also had a level of performance that indicated at least a basic level of digital competence.

Interpretation:

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These findings confirm that undergraduate students in Odisha have a generally good foundation in digital competence. The negative skew implies that institutional exposure to digital competence within curriculum, as well as a good use of digital tools in an academic, campus-wide or social context have allowed for a majority of students to have performance levels that are above average in DIL. Further, over 60% of students in the "high" category shows that digital literacy is becoming an important and core academic competence that looks to rival the academic task of reading and writing.

Objective 2: To compare the digital literacy of undergraduate students in relation to their academic stream.

Analysis of Normality Check for Academic Stream-wise Groups

Table-3: Result of Normality Test

Stream	Kolmogorov-Smirnov[a] (Sig.)	Shapiro-Wilk (Sig.)
Science	0.000	0.000
Arts	0.174	0.035
Commerce	0.000	0.001

Prior to conducting comparisons, normality was assessed using the Kolmogorov–Smirnov and Shapiro Wilk tests (see Table 3). For the Science and Commerce streams, and while Arts stream yielded some mix results with deviations from normality, all showed significant deviations from normality ($p < .05$). Weak evidence of a violation of normality would not affect the ability of ANOVA to be robust enough to carry out further tests.

Analysis with graphical representation of Digital Information Literacy

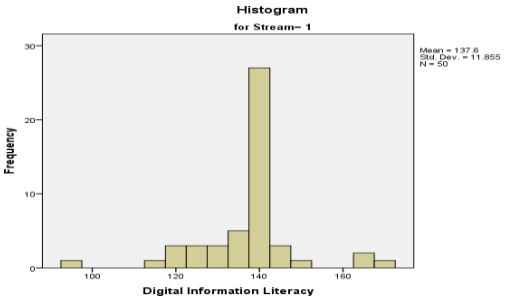

Figure No 1. Histogram of stream 1 (Science)

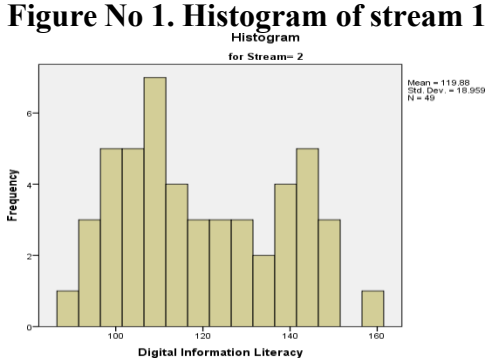

Figure No 2. Histogram of stream 2 (Arts)

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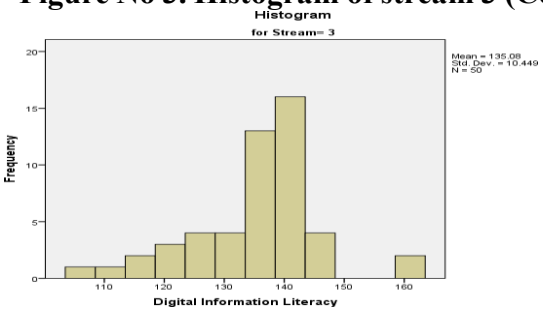
Figure No 3. Histogram of stream 3 (Commerce



The histograms (Figures 1–3) supplied more specific insights into streams' score distributions. The science student distribution exhibited a relatively symmetrical bell-shaped curve and low variability (M = 137.60, SD = 11.86), demonstrating a high level of digital competence and stability across the cohorts. In comparison, the visual form of the profile for arts students presented a wider and irregular distribution, with the scores positively skewed (M = 119.88, SD = 18.96), suggesting a larger range of values and uneven digital exposure, while commerce students exhibited a normal distribution with a slight left-skew and a tight range of scores (M = 135.08, SD = 10.45), indicating a strong homogeneity in the digital competence across students within the stream.

Table-4: ANOVA Summary of Digital Information Literacy

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9071.243	2	4535.621	22.456	0.000
Within Groups	29488.945	146	201.979		
Total	38560.188	148			

Result

The **ANOVA results (Table 4)** confirmed statistically significant differences among streams, $F(2,146) = 22.456$, $p < .001$, indicating that academic stream significantly influences Digital Information Literacy (DIL).

Table-5: Post Hoc Test: Tukey HSD Multiple Comparisons.

	Stream(I)	Stream(J)	Mean Difference	Std. Error	Sig.	95%CI (Lower Bound)	95% CI (Upper Bound)
Comparison	Science	Arts	17.722	2.857	0.000	10.96	24.49
	Science	Commerce	2.520	2.842	0.650	-4.21	9.25

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	Arts	Science	-17.722	2.857	0.000	-24.49	-10.96
	Arts	Commerce	-15.202	2.857	0.000	-21.97	-8.44
	Commerce	Science	-2.520	2.842	0.650	-9.25	4.21
	Commerce	Arts	15.202	2.857	0.000	8.44	21.97

The mean differences is significant at the 0.05 level.

To examine the source of the differences found the researchers carried out Tukey's HSD post hoc test (Table 5) to investigate any statistically significant mean difference between Science vs. Arts (MD = 17.72, $p < .001$) or Commerce vs. Arts (MD = 15.20, $p < .001$). However, investigators did not find a statistically significant mean difference between Science vs. Commerce (MD = 2.52, $p = .650$).

Interpretation

The analysis clearly establishes academic stream as a significant predictor of DIL. In both mean scores and for distributions, Science and Commerce students consistently outperformed Arts students. The histograms demonstrate that Arts students scored lower than the means of the other groups, and further, show that Arts students had greater variability which indicates this group may have a greater inconsistency in digital training. However, both Science and Commerce distributions were narrow and symmetrical, indicating that these two streams consistently integrated digital tools into their curricular experience. The absence of a statistically significant difference between Science and Commerce indicated that both groups displayed comparable levels of engagement with digital tools, while Arts students were disengaged. This outcome supports previous studies that have similarly documented a systematic digital divide between disciplines (Ranaweera, 2010; Sonowal, 2020). Overall, this evidence supports a case for broad curriculum reform, along with focused Arts work toward addressing inequity and preparing students for equitable futures**.**

Objective 3: To determine the extent to which digital literacy influence the metacognitive styles of undergraduate students.

Analysis

Table-6: Correlation; Digital Information Literacy & Regulation of Cognition

Variables	Mean	Std. Deviation	Number	Pearson corr.	Sig. (2-tailed)
Regulation Of Cognition	29.68	6.452	149	0.488	0.000
Digital Information Literacy	130.93	16.141	149	1	

Correlation is significant at the 0.01 level (2-tailed).

The correlation analysis showed that Digital Information Literacy (DIL) had meaningful positive correlations with both overarching domains of metacognition. Regulation of Cognition (the planning, monitoring, and evaluating components), as indicated in Table 6, demonstrated a moderate correlation with DIL ($r=.488$, $p<.01$). The same pattern was noted for Knowledge of Cognition (declarative, procedural, and conditional knowledge), which shared a positive

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correlation with DIL (r=.495, p<.01), as indicated in Table 10. Both correlations were significant at the 0.01 level.

Interpretation

The findings of this research confirm that metacognitive awareness is an important contributor/moderator of digital information literacy. Students who can consciously plan, monitor and regulate their own learning will likely be more successful at meeting learning challenges that emerge from the complexities of a digital world in gathering, evaluating and synthesizing online information. Similarly, their disposition toward applying their declarative and procedural knowledge of how to effectively use digital tools and strategies are also beneficial to students. This finding supports the existing literature on metacognitive skills as an important aspect of proficient, digital learning (Gasque, 2017; Denke et al., 2020).

These studies demonstrate that digital literacy is a competency that is also cognitively mediated, in addition to being a technical skill set. This has implications for policy and practice; access to digital tools is insufficient if education systems are not also investing in reflective learning practices which teach students to self-regulate their own engagement with the digital space. If metacognitive training were embedded into undergraduate programs, it would have the potential of increasing the future impact of digital literacy programs.

Analysis

Table 7: Regression of Digital Information Literacy on Overall Metacognitive Awareness

Predictor	B	SE B	t	p	95% CI Lower	95% CI Upper
Constant	38.9999	6.5030	5.997	< .001	26.148	51.851
DLS_Total	0.0271	0.0492	0.552	.582	–0.0700	0.1243

Model summary: R^2 = .002, Adj. R^2 = –.005, F(1,147) = 0.305, p = .582

Interpretation

From the table no. 7 it is depicted that the regression coefficient for DLS_Total (B = 0.027) indicates that for every 1-point increase in digital literacy, MAI_Total increases by only 0.027 points an effect so small that it is statistically and practically negligible. The p-value (.582) confirms not significance. With an R^2 of just 0.002, the model explains only 0.2% of the variance in overall metacognitive awareness. This means 98–99% of the variation in metacognition is unrelated to digital literacy.

Table-8: Regression of Digital Information Literacy on Knowledge of Cognition

Predictor	B	SE B	t	p	95% CI Lower	95% CI Upper
Constant	11.408	2.388	4.777	< .001	6.689	16.128
DLS_Total	0.0111	0.0181	0.615	.540	–0.0246	0.0468

Model summary: R^2 = 0.003, F(1,147) = 0.378, p = 0.540

Interpretation

From the table no. 8 it is depicted that the slope coefficient (B = 0.011) suggests that each 1-point rise in DLS_Total increases Knowledge of Cognition by only 0.011 points an extremely

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trivial effect. The p-value (.540) clearly indicates non-significance. An R^2 of 0.003 shows that digital literacy accounts for only 0.3% of the variance in students' knowledge of cognition.

Table-9: Regression of Digital Information Literacy on Regulation of Cognition

Predictor	B	SE B	t	p	95% CI Lower	95% CI Upper
Constant	27.592	4.3715	6.312	**< .001**	18.953	36.231
DLS_Total	0.0160	0.0331	0.485	.628	–0.0493	0.0814

Model Summary: R^2 = .002, F (1,147) = 0.236, p = .628

Interpretation

From the table no. 9 it is depicted that the predictive relationship between Digital Information Literacy and Regulation of Cognition is not statistically significant (p = .628). The coefficient is very small (β = 0.016), suggesting negligible practical effect. The confidence interval, extending from negative to positive values, confirms the absence of a reliable directional influence. With an R^2 of 0.2%, the model indicates that DIL does not meaningfully explain students' planning, monitoring, or evaluative learning behaviours. These findings support the argument that self-regulatory metacognition is a higher-order skill, not automatically enhanced by digital literacy, but rather through structured metacognitive instruction. While students who demonstrate digital literacy may handle digital resources efficiently, this does not necessarily imply they therefore possess improved metacognition. A student's metacognition (knowing how to plan, monitor, and regulate their own learning) seems to be impacted more by instructional design, reflective practice/training, and academic culture, rather than digital literacy alone. The regression analysis supports and shows that digital literacy is not an independent factor responsible for metacognitive development and supporting curriculum models embedded with digital literacy and metacognitive constructs would be more beneficial.

Findings and Discussion

The results offered evidence that undergraduate students were moderately to highly Digital Information Literate (DIM) with most students scoring in the highly proficient area, and none identified in the low scoring area (M = 130.93, SD = 16.14). This indicates a significant level of digital literacy readiness, and readiness in one sense, in students across Odisha, while students struggle with higher order skills, such as: evaluation, ethical reasoning, and curation of the information; this pattern has been seen in other research (Caton, 2025; Gutiérrez-Ángel et al., 2022; Kayyali, 2024; Smith & Storrs, 2023; Head et al., 2019; McCoy, 2022; Vázquez-Cano et al., 2023).

Findings also suggested there was a significant stream-wise difference, with Science and Commerce stream students outperforming Arts stream students: F(2,146) = 22.456, p < .001. This reflects disciplinary variations in technology integration, supporting previous work linking digital skills to curricular exposure (Mishra & Yadava, 2019; Ranaweera, 2010; Sonowal, 2020; Head et al., 2019; McCoy, 2022; Vázquez-Cano et al., 2023). Thus, the null hypothesis H_{01} (*There is no significant difference in Digital Information Literacy across academic streams*) was rejected.

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DIL was moderately and positively correlated with both Knowledge of Cognition and Regulation of Cognition ($r = .495$ and $r = .488$, $p < .01$), indicating that digitally competent students tend to show stronger metacognitive awareness. This aligns with studies emphasising the cognitive demands of digital information processing (Gasque, 2017; Mbandje, 2023; Teng, 2021; Veenman, 2013; Denke et al., 2020), supporting the research hypothesis H_{a1}: (*Digital Information Literacy is positively related to metacognitive styles*).

However, regression results showed that DIL did not significantly predict metacognitive outcomes (B values non-significant; $R^2 = .002–.003$). This suggests that metacognition is influenced more by the course design and experiences with reflection rather than digital abilities, which align with studies Schraw & Dennison (1994), Akyol & Garrison (2011), and Veenman (2013). Some research has shown that tasks incorporating digital components may facilitate reflection (e.g. Arjaya et al., 2023; Hidayat et al., 2024) but the effects will depend on the educational setting. Therefore, for the research hypothesis H_{a2} (Digital Information Literacy will significantly contribute to metacognitive styles.) To conclude, while students displayed an adequate digital information literacy and metacognition is connected with digital engagement, digital literacy is not wholly responsible for the development of metacognition. This indicates the need for stronger components within the Arts curricula that emphasize digital components as well as showing students skills to explicitly engage in metacognitive experiences with digital components in their other subjects, which would advance equitable digital readiness.

Summarization

This study examined undergraduate students' Digital Information Literacy (DIL), in different academic streams, and its relationship to metacognitive styles. The results indicate that most students displayed moderate to high levels of DIL across academic streams; however, some academic classes have an imbalance between the level of achievement. In all cases, students in Science and Commerce classes displayed better DIL scores than their peers in the Arts. There were positive moderate correlations between DIL to other metacognitive dimensions, and regression analysis shows that DIL was not predictive of metacognitive style. These findings indicate that digital competence is influenced by disciplinary exposure, while to develop metacognition, metacognition must be developed through programming.

Recommendations

Based on the findings of the study, the following recommendations are proposed:

1. Introduce systematic asymmetrical digital literacy modules across all disciplines, in particular in Arts programs, to mitigate inequities across disciplines.
2. Place intentional scaffolds for metacognitive training (planning, monitoring, evaluating strategies) into digital learning experiences to develop reflective engagement.
3. Utilize interdisciplinary digital pedagogy in order for students from all disciplines to approach data analysis and online evaluation tasks, as well as engage in authentic digital research tasks.
4. Engage in faculty development programming to equip instructors with strategies for developing digital literacy and metacognitive skill in light of classroom and blended learning approaches.
5. Implement frameworks for assessing digital literacy at the undergraduate level, so that institutions can monitor student competency progression and curriculum design.

Implications

The outcomes of this study suggest that it is vital for institutions of higher education to take up digital pedagogy that responds to the discipline. Although a strong association and weak predictive relationship of DIL with metacognitive styles was noted, DIL alone will not create self-regulated learners. Universities must provide digital training alongside reflective learning structures. Stream based differences will also provide equitable student preparedness for digital demands in their academic and work programs. In addition to that, the policy makers should acknowledge the cognitive aspects of digital literacy and design a national and state level initiatives in digital education for the students and teachers.

Conclusion

The study provides a more developed understanding of the interaction of digital literacy and metacognition in the undergraduate experience. Students reported relatively high levels of digital information literacy, and although there were differences in literacy across the academic streams in this sample, the differences may be attributable to the development of disciplinary eco-systems. In addition, the positive relationship found between digital information literacy and metacognitive awareness supports the hypothesis that the digital information literacy community is fundamentally a cognitive pursuit. However, the lack of predictive relationship highlighted in the results indicates that metacognitive development is not a direct outcome of simply engaging with digital literacy, especially when metacognitive awareness is not included in the design of the curriculum. Initiatives that enhance digital literacy practices across academic programs and seek to embed metacognition as a practical competency within the curriculum are important steps toward developing learners who are digitally capable, competent scholars, engaged, and reflectively aware in a digital mediated academic and work context.

REFERENCES

Akyol, Z., & Garrison, D. R. (2011). Understanding cognitive presence in an online and blended community of inquiry: Assessing outcomes and processes for deep approaches to learning. *British Journal of Educational Technology, 42*(2), 233–250. https://doi.org/10.1111/j.1467-8535.2009.01029.x

American Psychological Association. (2020). *Publication Manual of the American Psychological Association* (7th ed.). American Psychological Association. https://apastyle.apa.org/products/publication-manual-7th-edition

Amin, H., Malik, M. A., & Akkaya, B. (2021). Development and validation of Digital Literacy Scale (DLS) and its implication for higher education. *International Journal of Distance Education and E-Learning, 7*(1), 24-43. https://doi.org/10.36261/ijdeel.v7i1.2224

Arjaya, I. W., Setiawan, D., & Pratiwi, N. (2023). Digital tasks and reflective learning among university students. *Journal of Digital Learning Studies, 18*(1), 22–35.

Association of College and Research Libraries. (2016). Framework for information literacy for higher education. ACRL. http://www.ala.org/acrl/standards/ilframework

Beetham, H., & Sharpe, R. (Eds.). (2013). *Rethinking pedagogy for a digital age: Designing for 21st century learning* (2nd ed.). Routledge. https://doi.org/10.4324/9780203078952

Biglan, A. (1973). The characteristics of subject matter in different academic areas. *Journal of Applied Psychology, 57*(3), 195–203. https://doi.org/10.1037/h0034701

Chakravarty, R. (2019). Exploring digital confidence among arts students in Indian higher education. *Journal of Education and Development, 9*(4), 15–27. https://doi.org/10.5539/jed.v9n4p15

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE.

Denke, J., Jarson, J., & Sinno, S. (2020). Making the invisible visible: Enhancing information literacy and metacognition with a constructivist activity. *International Journal for the Scholarship of Teaching and Learning, 14*(2), Article 7. https://doi.org/10.20429/ijsotl.2020.140207

Eshet-Alkalai, Y. (2012). Thinking in the digital era: A revised model for digital literacy. *Issues in Informing Science and Information Technology, 9*, 267–276. https://doi.org/10.28945/1621

Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). SAGE.

Gasque, K. C. G. D. (2017). Metacognition in digital literacy: Theoretical and empirical issues. *Revista Brasileira de Educação, 22*(71), 673–690. https://doi.org/10.1590/S1413-24782017227134

Gutiérrez-Ángel, J. A., García-Sánchez, J. N., & Ramírez-Montoya, M. S. (2022). Digital competence in higher education: A systematic review. *Education and Information Technologies, 27*(6), 7765–7788. https://doi.org/10.1007/s10639-022-10954-6

Head, A. J., Wihbey, J., Metaxas, P. T., MacMillan, M., & Cohen, D. (2019). How students engage with news: Five takeaways for educators, journalists, and librarians. *First Monday, 24*(3). https://doi.org/10.5210/fm.v24i3.9430

Irhandayaningsih, A., & Hastoto, S. M. (2022). The relationship between metacognitive experiences and digital literacy in a self-directed learning environment. *E3S Web of Conferences, 359,* Article 03018. https://doi.org/10.1051/e3sconf/202235903018

Kayyali, M. (2024). Digital Literacy in Higher Education: Preparing Students for the Workforce of the Future. *International Journal of Information Science and Computing, 11*(1), 53–73. https://doi.org/10.30954/2348-7437.1.2024.6

Koltay, T. (2015). *Data literacy: In search of a name and identity*. *Journal of Documentation, 71*(2), 401–415. https://doi.org/10.1108/JD-02-2014-0026

Li, X., Wang, Y., & Huang, J. (2025). Digital literacy and employability skills: Evidence from Chinese undergraduates. *Computers & Education, 210,* 105054. https://doi.org/10.1016/j.compedu.2024.105054

Martin, A., Grudziecki, J., & Pankowska, M. (2020). Digital literacy in the age of AI: Rethinking competencies for higher education. *Education and Information Technologies, 25*(5), 4079–4095. https://doi.org/10.1007/s10639-020-10152-5

Mbandje, P. (2023). Metacognitive awareness and online information evaluation. *Journal of Cognitive Education, 19*(2), 112–127.

McCoy, E. (2022). Teaching and assessment of metacognition in the information literacy classroom. *Communications in Information Literacy, 16*(1), 1–25. https://doi.org/10.15760/comminfolit.2022.16.1.5

Mishra, S., & Yadava, A. (2019). Discipline and digital divide: Examining digital literacy among Indian undergraduates. *International Journal of Education and Development*

using Information and Communication Technology, 15(2), 131–142. https://files.eric.ed.gov/fulltext/EJ1220045.pdf

Pangrazio, L., & Sefton-Green, J. (2020). What is digital literacy? A comparative review of contemporary definitions and competencies. *Learning, Media and Technology, 45*(3), 386–402. https://doi.org/10.1080/17439884.2020.1750891

Popa, D., & Vasilescu, M. D. (2024). Inequities in digital competence: Towards inclusive strategies in higher education. *International Journal of Inclusive Education, 28*(1), 15–30. https://doi.org/10.1080/13603116.2022.2063478

Ranaweera, P. (2010). Information literacy programmes conducted by the universities in Sri Lanka [Unpublished manuscript]. National Institute of Library and Information Sciences, University of Colombo.

Schraw, G., & Dennison, R. S. (1994). Assessing metacognitive awareness. *Contemporary Educational Psychology, 19*(4), 460–475. https://doi.org/10.1006/ceps.1994.1033

Smith, J., & Storrs, K. (2023). Beyond digital familiarity: Examining gaps in higher-order digital literacy in higher education. *Journal of Computing in Higher Education, 35*(2), 259–277. https://doi.org/10.1007/s12528-022-09333-7

Sonowal, R. (2020). Digital divide in higher education: An analysis of ICT use among disciplines. *Journal of Educational Technology Systems, 49*(1), 27–46. https://doi.org/10.1177/0047239520921537

Teng, F. (2021). The benefits of metacognitive reading strategy awareness for academic literacy. *System, 97,* 102431. https://doi.org/10.1016/j.system.2020.102431

van Deursen, A. J. A. M., & van Dijk, J. A. G. M. (2014). The digital divide shifts to differences in usage. *New Media & Society, 16*(3), 507–526. https://doi.org/10.1177/1461444813495232

Vázquez-Cano, E., León-Urrutia, M., & López-Meneses, E. (2023). Digital research strategies among university students: Patterns and disciplinary differences. *Education and Information Technologies, 28*(2), 1411–1429. https://doi.org/10.1007/s10639-022-11370-8

Veenman, M. V. J. (2013). Learning to self-monitor and self-regulate. In R. Mayer & P. A. Alexander (Eds.), *Handbook of Research on Learning and Instruction* (pp. 197-218). Routledge.

Veenman, M. V. J., Van Hout-Wolters, B., & Afflerbach, P. (2006). Metacognition and learning: Conceptual and methodological considerations. *Metacognition and Learning, 1*(1), 3–14. https://doi.org/10.1007/s11409-006-6893-0

Zakir, A., Rahman, M., & Chowdhury, S. (2025). Digital literacy and career readiness: Evidence from South Asian universities. *Education and Information Technologies, 30*(2), 1883–1902. https://doi.org/10.1007/s10639-024-12111-9

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INNOVATIVE PEDAGOGICAL PRACTICES IN TEACHER EDUCATION FOR 21ST CENTURY SKILLS: A SYSTEMATIC LITERATURE REVIEW

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ABSTRACT

Education 4.0 is a framework that emphasizes rapid technological advancement to improve the quality of education. It also focuses on the importance of fostering 21st century skills. Therefore, this study focuses on the 3C's i.e., creativity, collaboration, and critical thinking. NEP 2020 also underscores the importance of 21st century skills for the holistic and well-rounded development of learners. NEP 2020, as well as NCFSE 2023, both have emphasised the inculcation of 21st century skills. Hence, the study focuses on 3C's, i.e., creativity, collaboration and critical thinking which is the core skill of 21st century skill.

Preferred Reporting Items for systematic Reviews and Meta-Analyses (PRISMA) 2020 framework have been used for this systematic literature review for investigating the pedagogical practices in teacher education for the inculcation of 21st century skills. Articles published from 2018 to October 2024 were fetched from the databases of Scopus and Web of Science. A total of 16 full texts were found eligible for the study after removing duplicates, applying inclusion and exclusion criteria as well as screening of the title and abstract. The key finding reveals that the most emphasised skill among all the skills is critical thinking and the most used pedagogical approach to inculcate these skills are technology based. However, in technological pedagogical approaches also, a wide range of innovative technological platforms such as CANVA, Zoom, and Chat GPT have been used. This study suggests the critical role of technology in education underscoring the need for balanced pedagogical strategies.

Keywords: Teacher Education, 21st Century Skills, Critical Thinking, Creativity, Technology

INTRODUCTION

Education 4.0 is a framework that emphasizes rapid technological advancement to improve the quality of education. It deals with educational technological advances, focuses on society's needs, and highlights developing 21st-century skills, especially 'critical thinking, creativity, and collaboration' (World Economic Forum, 2022). These skills also known as the 3C's are

essential for preparing individuals in rapidly changing global challenges. These 3C's are critical competencies in 21st-century education. Critical thinking requires the ability to examine, assess, and synthesize information to solve problems systematically and appropriately (partnership of 21st century skills {P21}). Creativity is the ability to think outside the box and generate new ideas across various contexts (Robinson 2011). Collaboration is the ability to do any work perfectly with others, emphasizing diverse perspectives and the ability to achieve the goal and empower in these skills (Trilling and Fadel 2009). These 3 C's empower individuals to explore the complex, powerful environment, and participate efficiently in society socially and professionally (OECD 2018).

Teacher education plays an important role in developing these competencies (skills) in the educational program, as teachers are the prime representative of any educational system (Darling Hammond 2017). The traditional teacher-education model focuses on content mastery rather than skill development (Schleicher 2018). This misplacement needs reform in teacher education programs to discourse 21st-century skills i.e. critical thinking, creativity, and collaboration (OECD 2019).

India's latest education policy, 'National Education Policy 2020', plays an important role in the country's educational reform and shifts education to competency-based learning from content-based learning. This policy also emphasizes developing 21st century skills such as critical thinking, creativity, and collaboration through innovative pedagogical approaches and experiential learning. It promotes the integration of multidisciplinary approaches and the overall development of learners to inculcate social, emotional, and cognitive skills (NEP 2020). NEP 2020 also emphasizes the reform in teacher education programs and their professional development. The policy defines the strategies to equip with the competencies to promote critical thinking, creativity, and collaboration among learners. Teacher education programs produce practice-oriented, dynamic students. NEP 2020 also deals with the United Nations Sustainable Development Goal 4 i.e. SDG 4, which ensures inclusive and equitable quality education for all. Through these skills i.e. critical thinking, creativity, and collaboration the policy tries to build a generation of lifelong learners to face global challenges.

After the recommendation of NEP 2020, National Curriculum Framework for School Education 2023 (NCFSE 2023) came into existence to construct the NEP 2020 vision and provide a detailed guideline for the development of the curriculum. This framework emphasizes the need to focus inquiry based experiential learning, and skills based education, from rote memorization. It also gives importance in the integration of pedagogical approaches that promote critical thinking, creativity, and collaboration. This framework synthesizes 21st century skills in 'pre-service and in-service' teacher education programs. It also recommended the use of innovative pedagogical practices such as simulations, and technology based teaching to engage learners and develop effective learning competencies.

NEP 2020 and NCFSE 2023 planned to shift the education system towards holistic development of learners, skill-based education for these vocational subjects introduced from class VI onwards. these policies focus on new educational demands with innovative pedagogical methods, and competency-based education (NEP 2020).

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This systematic literature review (SLR) explores existing pedagogical approaches and how to develop 'critical thinking', 'creativity', and collaboration by synchronizing the findings from the studies 2018- 2024. For this purpose, a rigorous research process has been used, and two databases, i.e., Scopus and Web of Science (WOS) were used as they are the most authentic databases in the field of social science. This study aims to recognize the challenges and strategies that support educators in planting '21st-century skills' in their teaching-learning process and training programs.

Rationale of the Study

The synthesisation of 21st century skills such as the 3 Cs i.e. critical thinking, creativity, and collaboration into teacher education programs is important for providing students to equip global challenges fruitfully. These are crucial skills for education 4.0, empowering individuals to change the environment and contribute their participation to society (Trilling and Fadel 2009; UNESCO 2019). Regardless of the development of these skills, traditional teacher education programs emphasize content based learning and only focus on content mastery rather than skills and their development, making misplacement with policy and practice (Schleicher 2018).

NEP 2020 emphasizes the significance of competency-based learning and innovative pedagogical approaches to overall development (NEP 2020). Moreover, NCFSE 2023 highlights experiential and inquiry-based learning that takes place from rote memorization to skills based (NCFSE 2023). These policies emphasize the crucial role of teachers in developing 21st-century skills in teacher education programs. Although these reforms remain fuzzy in practice.

This study addresses the gap between policy intent and implementation by systematically reviewing existing pedagogical approaches used in teacher education to foster the 3Cs. It investigates challenges, best practices, and strategies to enhance teacher training programs. By synthesizing recent literature, the study aims to provide actionable insights to align teacher education with the visions outlined in NEP 2020 and NCFSE 2023. This research is significant for advancing teacher preparation, ensuring that educators are well equipped to develop critical competencies in learners, and contributing to a robust, future-ready education system (Darling- Hammond 2017; OECD, 2018).

Research Question

1. How is the teacher education programme integrating 21st century skills among the future educators?
2. What are the different pedagogical approaches used by teacher educators to inculcate 3C^{s} i.e. creativity, critical thinking and collaboration within teacher education programmes?

Objectives of the Study

1. To study the research methodologies adopted in the existing literatures for fostering 21st century skills in teacher education
2. To explore the various pedagogical approaches used by the teacher educators to foster 3C in the teacher preparation programme

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3. To explore the various skills covered in the existing literature related to teacher education programme

Methodology of the study

PRISMA refers to the Preferred Reporting Items for 'Systematic reviews and Meta-Analyses' is the worldwide accepted framework for systematic literature review. This framework has been adopted in various fields, including social science, for enhancing the quality and transparency of systematic literature reviews by ensuring consistency in reporting across studies (Fuentes, 2022), and this study has also used the PRISMA 2020 framework for a valid and reliable result. This systematic literature review (SLR) investigates the role of innovative pedagogical practices in teacher education for cultivating critical 21st century skills, specifically critical thinking, creativity, and collaboration (3Cs). Articles published between 2018 to October 2024 were sourced from the Scopus and Web of Science databases, using keywords including "teacher education," "21st century skills," "critical thinking," "collaboration," and "creativity." Selected studies were analysed based on their approaches to fostering the 3Cs, their methodologies, and reported outcomes.

Table 1: Databases used for the study

Database used			
S.No	**Keywords**	**Scopus**	**Web of Science**
1	Teacher education AND 21st-century skills	195	74
2	Teacher education AND creativity AND collaboration AND critical thinking	11	02

Table 2: Inclusion and Exclusion criteria of the study

Inclusion Criteria	**Exclusion Criteria**
Research studies published in English	Non-English studies were excluded
Studies published between 2018- October 2024	Studies published before 2018 were excluded
Only open-access studies were included	Studies which were not open accessed were excluded
	Books were excluded from the study
	Book Chapters were excluded from the study

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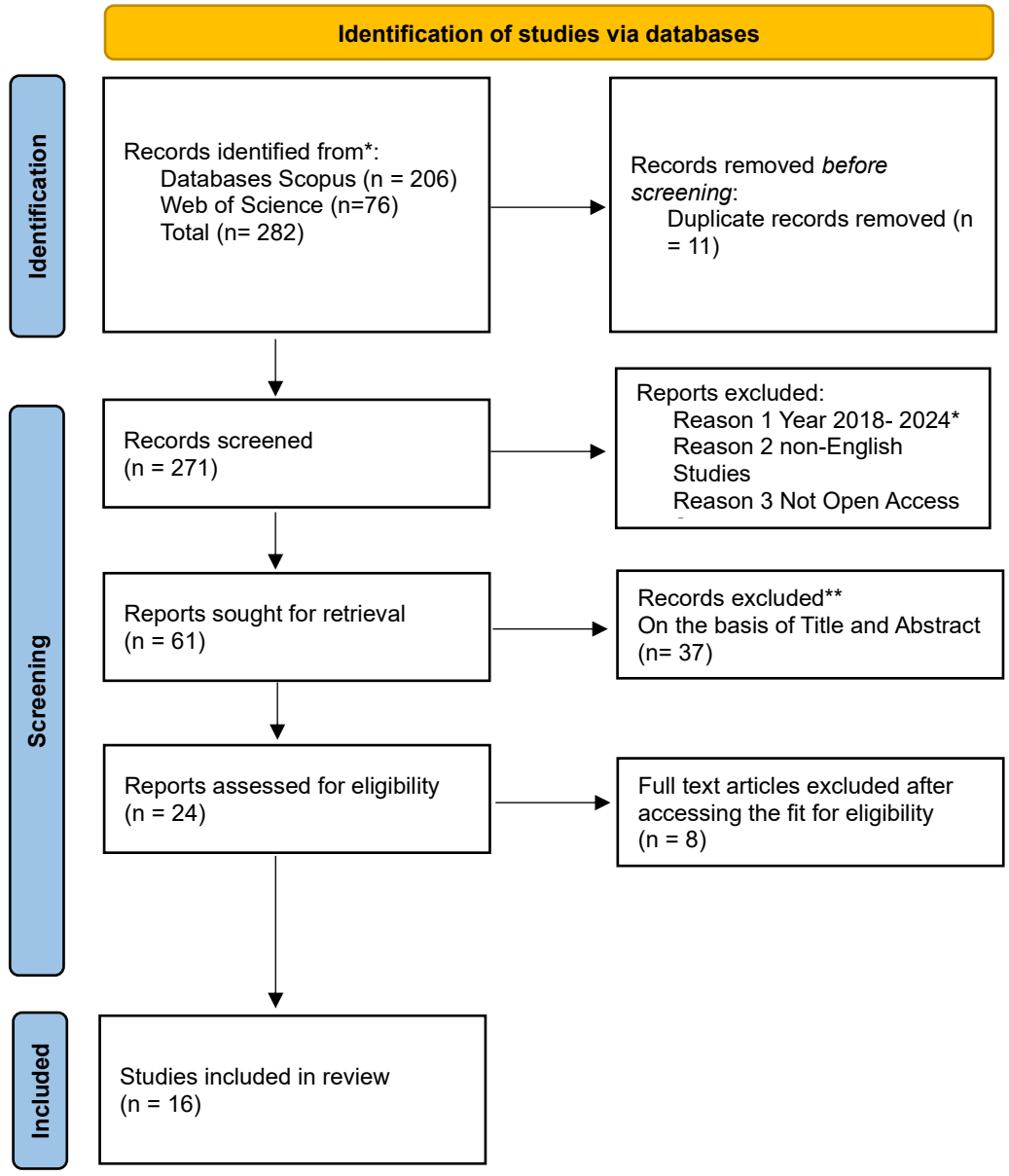
The studies accessed from Scopus (n=206) and Web of Science (n=76). After removing 11 duplicates, 271 studies were found, and after inclusion and exclusion criteria, 61 studies were included for this systematic review (SLR). After screening the title and abstract, 24 studies were assessed for full-text papers; only 16 papers were found eligible for this study.



Source: Page MJ, et al. BMJ 2021;372:n71. doi: 10.1136/bmj.n71.

Figure 1. PRISMA Flowchart for 21st Century Skills

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Research Methodology Used in the Studies	Sum of Frequency Distribution	Percentage of Research methodology used
Bibliometric Analysis	1	6.25%
Case Studies	1	6.25%
Mixed method	3	18.75%
Qualitative	6	37.50%
Quantitative	4	25.00%
SLR	1	6.25%
Grand Total	**16**	**100.00%**

Result and Discussion:

The analysis of the research methodology employed in 16 studies on 21st century skills and pedagogical approaches reveals key trends and preferences among researchers. The findings are summarised below:

Result and discussion of objective 1: To study the research methodologies adopted in the existing literatures for fostering 21st-century skills in teacher education.

Table 3: Research Methodology Used in the Studies

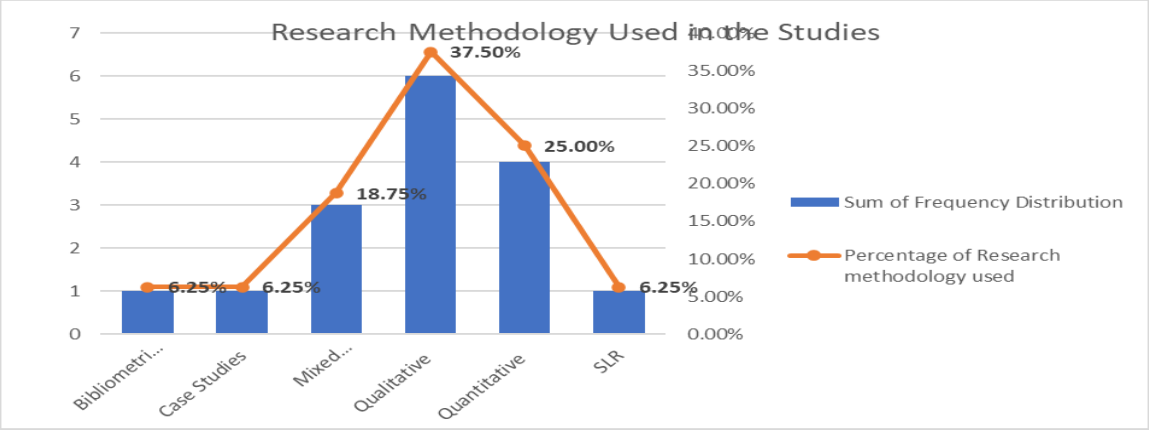

Figure 2: Research Methodology Used in the Studies

Table 3 and Figure 2 reveal that the most used research was qualitative in nature, accounting for 37.5% of the total studies, 25% of the studies were quantitative, and 18.75% of the total studies employed mixed method research. Furthermore, the bibliometric analysis or systematic

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literature review, or case studies approach was limited, which emphasizes its need to have deep insight into the integration of 21st century skills and the different pedagogical approaches needed to effectively integrate it in the teacher education programme.

Result and Discussion of Objective 2:

To explore the various pedagogical approaches used by the teacher educators to foster 3C in the teacher preparation programme

Table 4: Pedagogical Approaches Used in the Studies

Pedagogical Approaches Used in the Studies	Count of Pedagogical Approach	Percentage of Pedagogical Approach used
Art Education	1	6.67%
CANVA	1	6.67%
Microteaching	1	6.67%
Music	2	13.33%
Problem solving	2	13.33%
Technology	8	53.33%
Grand Total	**15**	**100.00%**

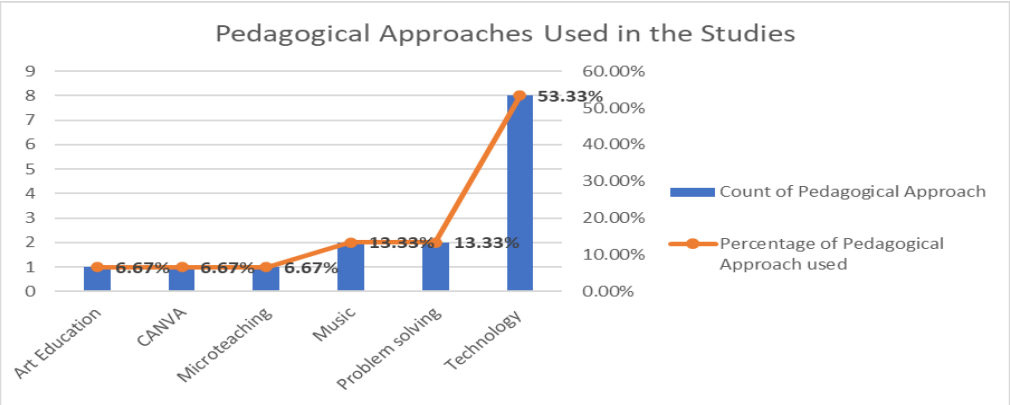

Figure 3: Pedagogical Approaches Used in the Studies

Table 4 and Figure 3 depict that the most used pedagogical approaches for developing the skill are based on technologies, accounting for 53.33% of the total approaches used. Problem solving and music represent 13.33% of the total approaches used, while microteaching, CANVA, and art education accounted for 6.67% each. This finding is consistent with the finding of Fernandez Vicente (2025), which suggested that using technology-based approaches like Project-Based Learning and digital tools like CANVA can be used to foster 21st-century skills.

The data reveals the dominating role of technology, whereas other creative approaches like art education or music or microteaching are being less used for developing skills. However, studies like Silitubun et al. (2024) suggest project-based learning (Tariq, 2024) suggests inquiry-based learning, and project-based learning, Karmilah et al. (2024) suggest project based learning and problem based learning can be used for inculcating 21st century skills.

Result and Discussion of Objective 3: To explore the various skills covered in the existing literature related to the teacher education programme

Table 5: Skills Covered in the Studies

Skills Covered in the Studies	Count of Skills Covered in the Studies	Percentage of Skills Covered in the Studies
21st-century skills	6	18.75%
Collaboration	4	12.50%
Communication	4	12.50%
Creative Thinking	1	3.13%
Creativity	4	12.50%
Critical Thinking	8	25.00%
Emotional Growth	1	3.13%
problem-solving	1	3.13%
Social Skills	1	3.13%
Thinking Skills	1	3.13%
Virtual Collaboration	1	3.13%
Grand Total	**32**	**100.00%**

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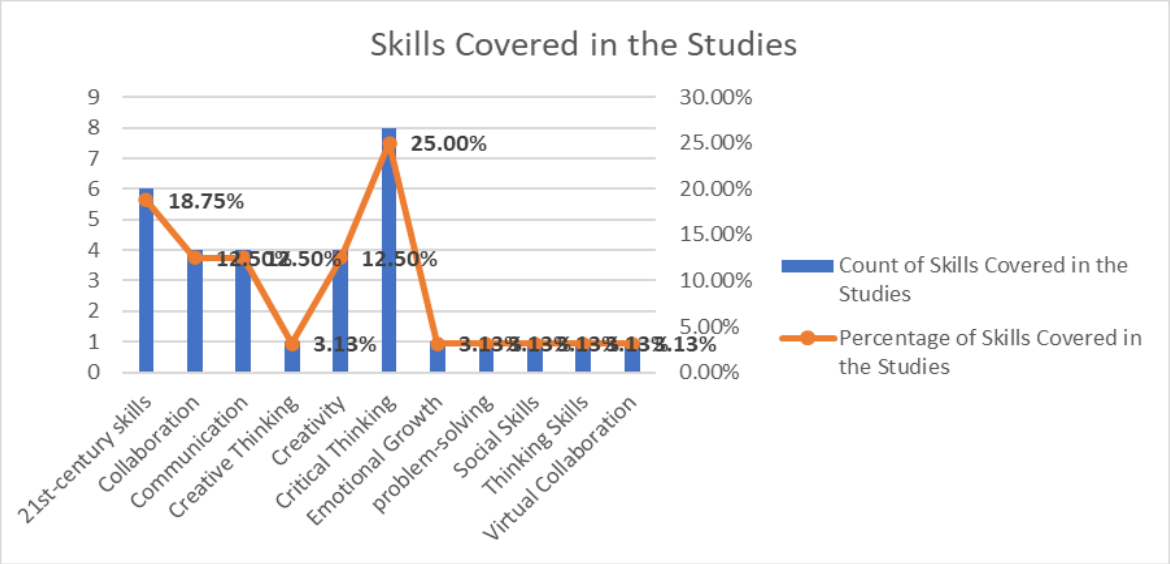

Figure 4: Skills Covered in the Studies

Table 5 and Figure 4 depict the various skills covered in the studies. Critical thinking emerged as the most addressed skill, followed by 21st century skill, accounting for 25% and 18.75% respectively.

Table 5 and Figure 4 show a varied emphasis on 21st century skills, with critical thinking receiving the highest coverage. The findings are summarized as follows:

Critical thinking emerged as the most addressed skill, accounting for 25% of all the types of skills analysed, followed by 21st century skills, accounting 18.75% of the skills covered in the study. Skills like Collaboration, Communication, and Creativity accounted for 12.50% each, whereas skills such as Creative Thinking, Problem Solving, Social Skills, Thinking Skills, Virtual Collaboration, and Emotional growth accounted for 3.13% each. The findings suggest that there is a strong emphasis on skills like critical thinking, collaboration, communication, and 21st century skills. This finding also aligns with the study of Akyol (2023); Diquito et al. (2022), whose finding states that skills like creativity, critical thinking, innovative technology use, communication, problem solving, and cooperation skills are used in the teaching and learning process.

Table 6: Technology Based Pedagogical Approaches used in the studies

Technology Based Pedagogical Approaches	Count of Pedagogical Approach in Technology	Percentage of Pedagogical Approach in Technology
Blended Learning	1	11.11%
CALL (computer-assisted language learning)	1	11.11%
Chat GPT	1	11.11%
Cybergogy	1	11.11%

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Google Suite	1	11.11%
ICT (Information and Communication and Technology)	1	11.11%
OER	1	11.11%
TPACK	1	11.11%
Zoom	1	11.11%
Grand Total	**9**	**100.00%**

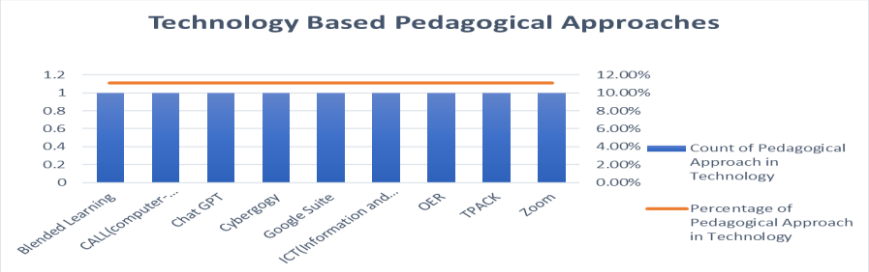

Figure 5: Technology Based Pedagogical Approaches

Table 6 and Figure 5 show the analysis of technology-based pedagogical approaches reveals a balanced distribution among various methods, indicating diverse applications of technology in educational practices. The findings are as follows:

Each approach, including Blended Learning, CALL (Computer-Assisted Language Learning), Chat GPT, Cybergogy, Google Suite, ICT (Information and Communication Technology), OER (Open Educational Resources), TPACK (Technological Pedagogical Content Knowledge), and Zoom, was employed in one study, contributing equally (11.11%) to the total.

This distribution highlights the variety of technology-driven pedagogical tools available and the equal emphasis placed on each in the studies analyzed. The findings of this study are consistent with the findings of Goradia (2018), which suggest TPACK as a medium to develop 21st-century skills. Solorzano Aveiga et al. (2025) suggest the flipped classroom. However, some studies (Kumbo et al., 2023) suggest innovative pedagogies such as gamification, virtual reality field trips, and collaborative coding projects for fostering 21st-century skills by enhancing student engagement and promoting critical thinking, creativity, and collaboration.

The findings suggest an openness to exploring diverse technological approaches in education, but they also point to the need for deeper investigation into the comparative effectiveness of these methods to determine best practices for different educational contexts.

Conclusion

This study was based on 3Cs in teacher preparation programmes while the result shows that many studies focussed on 4Cs i.e, critical thinking, creativity, communication and collaboration

as well as on 21st century skills. In the study a wide range of pedagogical approaches have been addressed to inculcate the skills. The most emphasized skills among all the skills covered in the study is critical thinking and the most used pedagogical approach is based on technology which shows the importance of technology for the 21st century learners. However, in technology a wide range of innovative platforms have been used such as CANVA, Zoom or Chat GPT. Furthermore, creative and experiential pedagogical approaches like microteaching and art education were underutilized.

The key findings suggest the critical role of technology in education while underscoring the need for balanced pedagogical strategies that integrate creativity, critical thinking, and collaboration to address the varied needs of learners. As per the NEP 2020, para 5.1 "Teachers are the one who shape the future of our nation and hence empowerment of teachers is required to ensure the best possible future for our children and our nation." Teachers should be equipped with the right weapons to shape the future of our nation and the best can be equipping the teachers with 21st century skills for future career demand which is the need of the hour.

Research Implications

The 21st century skills in teacher education play a significant role in preparing educators to navigate the complexities of modern classrooms and societal demands. Therefore, the stakeholders, i.e., educators, curriculum developers, and policy makers should collaborate with each other so that future teachers translate theory into practice and can create a learning environment that can meet the needs of the diverse learners of the 21st century, where students engage actively and apply it in their learning and day-to-day activities.

1. **For Educators:** For fostering 3Cs, teachers need knowledge and resources, and therefore, professional development of teacher educators is essential to prepare the future teachers so that these developments can be seen in real classroom practice.
2. **For Curriculum Developer:** The curriculum should be revised and updated to reflect the demand of contemporary education and develop skills like collaboration, creativity, critical thinking, communication, social skills, virtual collaboration, emotional growth, problem solving, and most important, digital literacy among the learners.
3. **For Policy Makers:** Policy makers play an important role in shaping the direction and priorities in the education system, so they should realign the educational system to foster above mentioned skills.
4. **For Researchers:** Future researchers can focus on various 21st-century skills and the effective pedagogical approaches to foster these skills among the learners.

By addressing these implications, educational stakeholders can work collaboratively toward an inclusive and effective learning ecosystem that prepares students for the challenges of the 21st century.

References:

Aktoprak, A., & Hursen, C. (2022). A bibliometric and content analysis of critical thinking in primary education. *Thinking Skills and Creativity*, *44*, 101029.

Akyol, A. P. D. N. A. (2023). Examination on 21st-Century Skills of Preschool Teachers. *Educational Research*, *14*(1), 57-70.

Asad, M. M., & Malik, A. (2024). Educational quality and inclusion through collaborative hybridized cybergogy: transformative learning horizons in Pakistani universities. *Interactive Technology and Smart Education*, (ahead-of-print).

Can, H. C., Zorba, E., &Işım, A. T. (2024). The effect of blended learning on 21st-Century skills and academic success in education of physical education teachers: A mixed method research. *Teaching and Teacher Education*, *145*, 104614.

Cubides, S. M., Chiappe, A., & Ramirez-Montoya, M. S. (2024). The transformative potential of Open Educational Resources for teacher education and practice. *Open Learning: The Journal of Open, Distance and e-Learning*, 1-20.

Darling-Hammond, L. (2017). *Teacher education around the world: What we can learn from international practices*. Routledge.

Diquito, T. J., Anter, M. C. J., & Bulonos, N. J. (2022). A survey of 21st century skills acquisition among the preservice teachers of teacher education programs. *European Journal of Open Education and E-Learning Studies*, *7*(2). https://doi.org/10.46827/ejoe.v7i2.4368

Eddy, M., Blatt-Gross, C., Edgar, S. N., Gohr, A., Halverson, E., Humphreys, K., & Smolin, L. (2021). Local-level implementation of Social Emotional Learning in arts education: Moving the heart through the arts. *Arts Education Policy Review*, *122*(3), 193-204.

Fuentes, A. (2022). Reseña de sitio web: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Declaración PRISMA 2020. Revista de Estudios e Investigación En Psicología y Educación, 9(2), 323–327. https://doi.org/10.17979/reipe.2022.9.2.9368

Goradia, T. (2018). *Role of Educational Technologies Utilizing the TPACK Framework and 21st Century Pedagogies: Academics' Perspectives*. *6*(3), 43–61. https://doi.org/10.22492/IJE.6.3.03

Hilliker, S. M., &Loranc, B. (2022). Development of 21st century skills through virtual exchange. *Teaching and Teacher Education*, *112*, 103646.

Hinchcliff, M., & Mehmet, M. (2023). Embedding Canva into the marketing classroom: a dialogic and social learning approach to classroom innovation. *Higher Education, Skills and Work-Based Learning*, *13*(6), 1174-1186.

Karmilah, K., Arum, E. R., & Winarti, W. (2024). Embedding 21st Century Skills in English Language Education for Health Vocational Students: A Systematic Literature Review.

Jurnal Pendidikan Humaniora, *12*(3), 161. https://doi.org/10.17977/um011v12i32024p161-169

Kartal, G. (2024). The influence of ChatGPT on thinking skills and creativity of EFL student teachers: a narrative inquiry. *Journal of Education for Teaching*, 1-16

Kavenuke, P. S., Kinyota, M., & Kayombo, J. J. (2020). The critical thinking skills of prospective teachers: Investigating their systematicity, self-confidence and scepticism. *Thinking Skills and Creativity*, *37*, 100677.

Kumbo, L. I., Mero, R. F., & Hayuma, B. J. (2023). Navigating The Digital Frontier: Innovative Pedagogies for Effective Technology Integration in Education. *The Journal of Informatics*, *3*(1), 14–33. https://doi.org/10.59645/tji.v3i1.142

Ministry of Education. (2020). *National Education Policy 2020*. Government of India. Retrieved from https://www.education.gov.in

NCERT. (2023). *National Curriculum Framework for School Education 2023*. National Council of Educational Research and Training.

Nurwulandari, I., Sajidan, S., Rochsantiningsih, D., & Sukarmin, S. (2024). Optimisation of Critical Thinking, Creative Thinking, Collaboration, and Communication (4C) in the Micro Teaching Programme in the Department of Elementary School Teacher Education. *Ianna Journal of Interdisciplinary Studies*, *6*(2), 263-276.

OECD. (2018). The future of education and skills: Education 2030. Organisation for Economic Co-operation and Development.

OECD. (2019). *Education at a glance 2019: OECD indicators*. OECD Publishing.

Ong, Q. K. L., & Annamalai, N. (2024). Technological pedagogical content knowledge for twenty-first century learning skills: The game changer for teachers of industrial revolution 5.0. *Education and Information Technologies*, *29*(2), 1939-1980.

Orakcı, S., & Khalili, T. (2024). The impact of cognitive flexibility on prospective EFL teachers' critical thinking disposition: the mediating role of self-efficacy. *Cognitive Processing*, 1-15.

Park, M., & Son, J. B. (2022). Pre-service EFL teachers' readiness in computer-assisted language learning and teaching. *Asia Pacific Journal of Education*, *42*(2), 320-334.

Partnership for 21st Century Skills (P21). (2019). *Framework for 21st-century learning*. Retrieved from http://www.battelleforkids.org/networks/p21

Robinson, K. (2011). *Out of our minds: Learning to be creative*. Capstone.

Schleicher, A. (2018). *World class: How to build a 21st-century school system*. OECD Publishing.

Solórzano Aveiga, E. A., Intriago Vaca, A. E., Solórzan Aveiga, C. A., & Meza Arguello, D. M. (2025). *El papel de la tecnología en la implementación de metodologías activas en el siglo XXI*. *3*(1). https://doi.org/10.63688/t53ehs37

Tariq, M. U. (2024). Enhancing Students and Learning Achievement as 21st-Century Skills Through Transdisciplinary Approaches. *Advances in Higher Education and Professional Development Book Series*, 220–257. https://doi.org/10.4018/979-8-3693-3699-1.ch007

Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times*. Jossey-Bass.

UNESCO. (2019). *Education for sustainable development: A roadmap*. United Nations Educational, Scientific and Cultural Organization.

Vasil, M., Weiss, L., & Powell, B. (2019). Popular music pedagogies: An approach to teaching 21st-century skills. *Journal of Music Teacher Education*, *28*(3), 85-95.

Wang, P., & Ko, J. (2022). ICT competency and practicum of preservice teachers as digital natives: a mixed-method study. *Asia Pacific Journal of Education*, 1-16.

World Economic Forum. (2022, October). *Education 4.0 India: Insight report* (in collaboration with UNICEF & YuWaah). https://www3.weforum.org/docs/WEF_Education_4.0_India_Report_2022.pdf

Yoo, H., & Kang, S. (2021). Teaching as improvising: Preservice music teacher field experience with 21st-century skills activities. *Journal of Music Teacher Education*, *30*(3), 54-68.

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INTEGRATING ARTIFICIAL INTELLIGENCE WITH DIGITAL PEDAGOGIES FOR MODERN EDUCATION

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ABSTRACT

Artificial Intelligence (AI) is increasingly discussed as a disruptive element in the contemporary educational setting, and it is providing new opportunities in the digital teaching format. This paper examines how AI may be applied in the educational field to improve teaching practices, student engagement, and assessment patterns. To examine the transformation of digital education with the help of AI-powered tools such as chatbots, adaptive learning systems, and predictive analytics, the critical narrative review will compile the recent literature. The review attracts attention to how emerging technologies lead to efficiency and engagement as well as personalization and sheds light on practical and ethical concerns. Besides, AI allows using automated assessments and formative testing as well, liberating the teachers to focus on more demanding types of educational tasks, such as critical thinking, inventiveness, and mentorship. Despite these positive features, the implementation must be done with great attention since the issues concerning the sustainability, preparedness of teachers, and algorithmic bias, accessibility and ethical application also demand careful consideration. The research notes that AI must be considered as a cooperative developing tool but not as a substitute of human teachers. The implications of this study to academics, educators, and policy-makers are to implement AI-enhanced digital pedagogies in a responsible and just manner by highlighting the benefits and well as concerns. Based on the results of the study, in the event of the ethical, infrastructure, and professional development needs being fulfilled, incorporation of AI could develop educational settings that can be flexible, inclusive, and future ready.

Keywords: Artificial Intelligence, Digital Pedagogy, Personalized Learning, Adaptive Assessment, Learner Engagement, Teacher Readiness, Ethical AI, Edtech, AIED, Systematic Review

INTRODUCTION

Artificial intelligence (AI) is one of the most transformative forces that are changing the education sector in the digital age. Its integration into digital pedagogies has enabled the creation of new possibilities in teaching and learning by enabling the intelligent distribution of content, adaptive feedback, and highly personalized training (Zawacki-Richter et al., 2019). Student-centered and differentiated methods are also encouraged by AI-based systems where, unlike traditional ones, they analyze data of the learners to identify their strengths, weaknesses, and approaches to learning. In addition to content distribution, AI-enhanced digital pedagogies contain learner support chatbots, virtual simulation, intelligent tutoring systems, and predictive

analytics capable of enabling a teacher to make well-informed decisions (Luckin, 2018). Besides enhancing student interactions, the innovations will help release teachers of tedious chores and concentrate on vital pedagogical aspects such as creativity, problem-solving, and thinking (Chen et al., 2020). Nevertheless, AI application in education also has some urgent problems. To ensure fair access and appropriate utilization, algorithmic bias, ethical use, equity, and data privacy issues are to be addressed (Selwyn, 2019). This study is aimed at exploring the potential of AI and digital pedagogies to be successfully combined in order to establish comprehensive, inclusive, and future-responsive educational establishments.

LITERATURE REVIEW

The way Artificial Intelligence (AI) is integrated into education has become an aspect that has received significant interest over the last few years, especially when it comes to the integration of AI into digital pedagogies. It is proposed that AI technologies can transform the teaching and learning process with the ability to meet personalization, automation, and data-driven decision-making (Holmes et al., 2019). The literature notes that adaptive learning systems with AI can offer personalized learning opportunities, such that learners can advance at a timely rate and solve knowledge deficiencies (Zawacki-Richter et al., 2019).

A prominent branch of literature draws attention to the role of AI in promoting digital pedagogies by using intelligent tutoring systems, chatbots and automated assessment tools. Luckin (2018) claims that these tools not only make the experience of learners deeper, but also help teachers ease the dulling workflow, thereby enabling them to concentrate on other demanding pedagogical endeavors and influence development of critical thinking and creativity. Equally, Chen, Xie, and Hwang (2020) note that AI facilitates interactive learning and collaboration with the perspective that it allows predictive analytics and personalized feedback mechanisms. Along with these benefits, researchers also indicate possible difficulties and threats. Selwyn (2019) cautions that overdependence on AI in the classroom can only enforce inequity, especially in the scenario when the technology is unequally distributed among socio-economic lines. The ethical issues, bias of algorithms, and data privacy have been associated with concerns, and educators and policymakers must develop cautious and balanced attitudes (Williamson and Eynon, 2020).

It is also mentioned in the literature that the debate about the educational consequences of AI is increasing. Though its advocates propose that AI-facilitated learning is appropriate for both constructivist and student-centered models as it permits the learner additional power in their educational process, opponents present the view that the algorithmic control can undermine the human agency and diminish the interpersonal aspect of education (Luckin, 2018; Selwyn, 2019). All these strains bring up the point that AI should be considered as an addition and not a replacement to teachers.

All in all, the considered articles tend to agree upon the idea that AI is capable of improving the digital pedagogies by facilitating individualization, efficiency, and innovation. Nevertheless, the issues that remain unaddressed about ethics, equity, and implementation require critical analysis. In this way, the continuation of research, in addition to the effectiveness and efficiency of technologies, should also be aimed at evaluating the social and cultural implication of their inclusion in contemporary education.

RATIONALE OF THE STUDY

Accelerated education digitization has reportedly boosted the attention towards AI as a source of both customized and inclusive learning. However, the extant research has been sporadic, almost full of technical investigations and short empirical data of pedagogical change. The given research is needed to bring together information about various resources and take a critical look at how AI can be adjusted to ethical, inclusive, and sustainable learning purposes. The central issue of the study is that the critical conceptual clarity of AI-driven research in education is urgently required due to its emphasis on the pedagogical, social, and ethical aspects.

The rationale of the study is that the increased knowledge of the integration of AI into the digital pedagogy is a shift in how the concept of teaching and learning is conceived and not merely a technical enhancement. When they rely on AI-powered technologies to reduce administrative loads, educators will have the opportunity to focus on more advanced educational tasks such as promoting creativity, problem-solving, and critical thinking (Luckin, 2018). At the same time, the learners gain autonomy due to interactive and flexible platforms that promote the contemporary learning goals in self-directed and life-long learning.

Nevertheless, in spite of all these opportunities, one cannot disregard the concerns of algorithmic bias, digital equity, data privacy, and ethical consequences (Selwyn, 2019; Williamson and Eynon, 2020). Unless it is carefully adopted, AI can only support existing inequalities, as opposed to ensuring inclusivity. That is why there is a need to conduct a stringent evaluation that examines the benefits and drawbacks of AI so that it can ensure the establishment of fair, efficient and future-oriented learning institutions.

In that way, the given study is justified because it will explore the ethical, social, and pedagogical issues of integrating AI into modern education. In so doing, it will aim to provide viewpoints that would assist academicians, educators and legislators to develop inclusive and accountable digital age teaching approaches.

OBJECTIVES OF THE STUDY

The combination of Artificial Intelligence (AI) and digital pedagogies can revolutionize contemporary education due to increased teaching efficiency, personalization of learning, as well as equipping students with future advantages. This paper aims to inform about utilizing AI-driven solutions that can be used to facilitate digital pedagogy to enable more engaging, efficient, and inclusive learning spaces.

- To investigate how AI might be used to improve digital pedagogies in order to build a better teaching process, student interaction, and grading systems.
- To study the possibilities of AI in the achievement of a personalized learning process based on the needs, abilities, and preferences of a wide range of learners.
- To address the issues and possibilities of AI implementation in conjunction with digital pedagogies related to accessibility, ethics, teacher preparedness, and long-term sustainability of the contemporary education.

RESEARCH QUESTIONS OF THE STUDY

Artificial Intelligence (AI) is reshaping digital pedagogies by offering new ways to teach, learn, and evaluate. To guide this inquiry, the study frames the following research questions –

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- How can AI enhance digital pedagogical practices to improve teaching strategies, learner engagement, and assessment?
- In what ways can AI personalize learning experiences to address the diverse needs, abilities, and preferences of students?
- What challenges and opportunities arise from integrating AI with digital pedagogies, particularly in terms of accessibility, ethics, teacher readiness, and sustainability?

METHODOLOGY

The article is based on the Critical Narrative Review methodology to investigate the implementation of Artificial Intelligence (AI) and digital pedagogies in the context of contemporary teaching. To analyze the scholarly articles, policy documents, reports, and case studies that cover the AI use in teaching and learning published between 2010 and 2025, a content analysis approach is used. It will be done by determining common themes, trends, and theories of AI that can be used pedagogically, especially in personalized learning, adaptive assessment, and teacher support. Besides, the research does an analysis of critical systematic review in order to assess the strengths, weaknesses as well as ethical implications of AI-based pedagogical models. This is done through a strict assortment of peer-reviewed materials on valid databases, and coding, categorization and thematic synthesis. Through the critical analysis of what has been known, the research aims at identifying gaps, contradictions, and novelties that shape the dialogue on digital pedagogy. Content analysis paired with systematic review will guarantee a deep and broad approach to the knowledge of how AI can revolutionize the educational process in addition to managing the issue of accessibility, preparedness of the teacher, and sustainability in the long run.

Academic sources were found in the Scopus, ERIC, Springer Link, and Google Scholar resources. The search involved a combination of an artificial intelligence in Education, digital pedagogy and adaptive learning.

- Inclusion criteria: The peer-reviewed literature (20102025) on the topic of AI uses in instruction and education.
- Exclusion criteria: papers that are not in the education field or studies that are not highly rigorous.

The total number of documents screened (78) was sent to thematic synthesis (46). Thematic content analysis and coding of major themes (pedagogical enhancement, personalization, ethics, and teacher readiness) were used in the analysis of data. The period 20102025 was decided to reflect the development of pre-education AI systems into the recent development of generative AI.

DISCUSSIONS OF THE STUDY

Objective No.1: **To investigate how AI might be used to improve digital pedagogies in order to build a better teaching process, student interaction, and grading systems.**

Artificial Intelligence (AI) has emerged as a transformative force in education, offering opportunities to reimagine digital pedagogical practices and reshape the teaching–learning ecosystem. By enabling adaptive learning environments, supporting educators in designing

effective strategies, and enriching learner experiences, AI can significantly improve teaching strategies, learner engagement, and assessment outcomes.

(a) AI and Teaching Strategies:

AI can be used to customize and data-driven teaching methodologies by evaluating the behavior of learners, their background, and advancement to propose specific teaching approaches. For example, Intelligent Tutoring Systems (ITS) can offer an individualized learning journey and immediate feedback which can assist teachers in managing differences within the classroom (Woolf, 2021). Contrary to the usual practices where one can utilize a single approach to fill in the existing knowledge void, AI-driven solutions have the potential to recognize it and propose a specific intervention. The AI-based analytics would assist teachers in planning their lessons and curriculum development by providing foreseeable results of the student performance and the possible areas of weaknesses (Baker and Siemens, 2019). As an example, educators can be made aware of students who risk performing poorly by predictive learning analytics which can then take corrective measures in time. Moreover, large language models and other generative AI software can be used by educators to produce content, quizzes, and interactive resources, which are consistent with the needs of learners (Zawacki-Richter et al., 2019). The innovations ease the administrative workload and enable tutors to engage in the higher order pedagogical work, including facilitation of critical thinking and mentoring.

(b) AI and Learner Engagement:

The active participation of learners is an important factor of educational achievement, and AI technologies have been shown to facilitate it. Adaptive learning systems develop individualized learning paths, and the students are not discouraged working slowly (Holmes et al., 2021). Chatbots, virtual reality (VR) and gamification powered by AI can serve immersive environments so that they facilitate communication and conceptual learning. As an illustration, AI-driven gamified systems are a form of rewarding, challenges, and adjustable levels of difficulty in real time, keeping students engaged and excited (D'Mello and Graesser, 2015). Also, conversational AI applications can serve as virtual learning assistants, who can be accessible 24/7 to respond to questions, explain uncertainties, and give formative feedback (Chen et al., 2020). This helps to facilitate a favorable learning environment, where students feel freer to interact with digital learning platforms especially those students who may not be free to express themselves in mainstream learning. With the inclusion of assistive technologies, like speech recognition, predictive text, and translating tools, AI can help to support the learning of learners with diverse needs (Luckin et al., 2016).

(c) AI and Assessment:

The use of AI in assessment practices is an event that is changing the paradigm of assessment practices. Conventional evaluation usually focuses on summative assessment, whereas AI

encourages formative and ongoing assessment with the analysis of real-time data upon the interaction with learners. The algorithms of machine learning are also able to trace the problem-solving strategies, time use of learners on tasks, and errors in understanding of concepts, which offer comprehensive diagnostic data (Baker, 2022). This enables instructors to create tests that are process centered and result centered. Automated grading systems made with the help of AI improve efficiency as they are able to assess assignments, quizzes, and even essays with high accuracy and speed (Zhai et al., 2021). Even though the issue of fairness and prejudice remains, AI-based evaluation is becoming more and more reliable as a result of continuous advancements in natural language processing (NLP). Notably, alternative assessment formats, i.e., simulations and adaptive tests, during which critical thinking and creativity are to be evaluated, are also supported by AI (Instead of rote memorization) (Heffernan and Heffernan, 2014). The AI also facilitates the use of individualized feedback structures; these are necessary in the development of the students. Rather than the generic comments, AI will be able to provide a specific and actionable feedback based on the weaknesses and strengths of learners, encouraging them to have a growth mindset and keep improving (Holmes et al., 2019).

AI can transform digital pedagogy by transforming the teaching practices to be more adaptive, learner-centered or more interactive, and making assessment practices more personalized and formative. Nevertheless, it can only be implemented with due ethical attention, such as concerns of data privacy, algorithmic bias and fair access. Once combined intelligently, AI can act as a supplement to teachers, rather than replace them, as it allows the educator to move away from traditional routine instructional duties and assume an effective role of mind-stimulating, imaginative, and well-rounded learner development. Therefore, AI-based digital pedagogy is not merely a technological advancement, but also a change in pedagogy that can bring many beneficial improvements in education quality and inclusivity.

Objective No.2: **To study the possibilities of AI in the achievement of a personalized learning process based on the needs, abilities, and preferences of a wide range of learners.**

Individual learning has become one of the most topical paradigms in contemporary education, which seeks to adjust the education process to the personal needs, abilities, and preferences of an individual learner. It has been enhanced by the use of the data-driven, adaptive, and interactive learning experience delivered through the use of Artificial Intelligence (AI) as one of the tools into the digital pedagogies. AI can support teachers in leaving the standardized education model and provide tailor-made learning paths that will help them connect with students, inspire them, and achieve academic success.

Among the most important methods of personalizing the learning process, adaptive learning systems should be mentioned since, based on the performance of the learners, AI changes the sale speed, the level of difficulty and the course materials. The real-time information processed by AI algorithms includes test scores, behavioral patterns and response rates and is used to offer suitable scaffolding (Chen et al., 2020). To take the example of Carnegie Learning or DreamBox, mathematical problems are presented so that they align with the proficiency of the

learner, which means that neither the students will feel overly challenged nor challenged at all (Pane et al., 2015). This is a highly effective mastery learning loop that enables the students to master at their own speed.

The personalized delivery of content is also supported by AI, to filter out resources according to the needs of learning. Based on the analysis of the interests of students, machine learning can offer multimedia content; this could be videos, simulations, or interactive games that are recommended to users, depending on the style of learning they prefer (Luckin et al., 2016). As an example, graphical illustrations can be given to the visual learners, and podcasts or lectures delivered to auditory learners. These types of targeted approaches enhance better understanding and memory hence education is more accommodative to different learners.

The other important input of AI is natural language processing (NLP)-based technologies that allow one-on-one interaction and assisting. The intelligent tutoring system such as the AutoTutor or chatbots can give feedback in real-time, respond to questions, and initiate a conversation to discuss misconceptions (Graesser et al., 2018). These systems work to change explanations depending on the reaction of a student so that the explanatory path is tailored to the student's needs which resembles individual tutoring. In Duolingo, a language learning platform based on AI, NLP and reinforcement learning are used to adapt the exercises and hints based on the performance of the user, thus providing a learner-specific and dynamic experience (Loewen et al., 2019).

AI also caters to the needs of students who have physical disabilities and other learning difficulties. Student learning can become possible with hearing or visual disabilities because tools driven by AI can be used to assist in providing real-time captions, text-to-speech, or speech-to-text services (Holmes et al., 2019). Likewise, predictive analytics can be used to find at-risk students based on the engagement data, which allows teachers or the support systems in taking timely measures (Siemens & Long, 2011). Through having a broad base of learners, AI enhances inclusivity in digital pedagogies.

In addition to academic personalization, AI helps to promote emotional and motivational levels of learning. Designing the technologies that affective computing is able to recognize the emotional state of the learners, which is possible by checking their faces or analyzing their words or the dynamics of their interactions and make the necessary adjustments to the content delivery (D'Mello and Graesser, 2015). As an example, in case students show some cases of frustration, the system can give hints or motivating text, thus keeping the activity intact and continuing. This kind of affective personalization assists in the generation of the supportive learning environment, which would not only be supportive of the cognitive but socio-emotional needs as well.

Lastly, AI makes students independent and self-directed in their learning. Individual dashboards, progress meters and learning analytics allow learners to track their progress, focus on their goals, and look back on their accomplishments (Ifenthaler and Yau, 2020). AI-student applications promote self-reflection in the best way to promote metacognitive awareness and help students feel in control of their studies, which is essential to life-long learning in an ever-evolving world.

AI provides individualized learning by providing adaptive routes, individualized content, intelligent tutoring, accessibility assistance, affective comments, and self-regulation instruments. These functionalities meet the various needs, capabilities and interests of the students making education more inclusive, student-centered and engaging. Nevertheless, issues like the privacy of data, the appropriate use of AI and the willingness of teachers are still problematic factors to be taken into account to make this implementation sustainable. In the case of responsible application, AI can transform personalized learning and transform the future of education.

Objective No 3: **To address the issues and possibilities of AI implementation in conjunction with digital pedagogies related to accessibility, ethics, teacher preparedness, and long-term sustainability of the contemporary education.**

The combination of Artificial Intelligence (AI) with digital pedagogies provides revolutionary learning and teaching opportunities and, at the same time, demonstrates great difficulties. Accessibility is one of the most prominent implementation spheres. Artificial intelligence can support inclusive learning by offering tailored support mechanisms in the form of adaptive learning systems, text-to-speech features, automatic translation, and other technologies to support learners with any disability or language barrier (Luckin et al., 2016). Moreover, AI platforms can make high-quality educational content in remote areas or under-resourced ones more accessible, which would close the gaps in teaching knowledge and infrastructure (Zawacki-Richter et al., 2019). The distribution of these benefits is lopsided though. The ongoing digital divide restricts access to those students who do not have access to quality internet, devices or digital literacy skills, and much of the AI is created in the major languages preventing it being used in multilingual environments (Holmes et al., 2019; Chen et al., 2020). Unless such barriers are mitigated, AI is bound to compound the existing inequalities instead of mitigating them.

Another important dimension that is vital in the integration of AI is the ethical considerations. Artificial intelligence can help preserve equity in education, determine grading discrimination, and plagiarism (Baker, 2022). New schemes promote responsible application of AI, which means that it should be accountable, transparent, and protect student data (Holmes et al., 2021). However, ethical issues are still significant. The use of AI is dependent on student data, thus the issues of privacy, surveillance, and informed consent emerge (Williamson and Eynon, 2020). Algorithms can reproduce the biases of the underlying training data, which creates unequal results of certain groups of learners (O'Neil, 2016). Also, there is a risk of questioning the ownership of data and the preference of profitability over welfare of students when AI is commercialized in education practice. To manage these ethical issues, strict policy formulation, governance, and compliance with the set guidelines on ethics should be put in place.

The preparation of the teacher is also a major factor in the effective implementation of AI in the school setting. The AI can provide possibilities to reduce the load on the administration and offer practical feedback on the development of the lesson plan, as well as create customized content and enable educators to work on the tasks that are more challenging to achieve in pedagogy, such as mentoring and critical thinking (Holmes et al., 2019). The teachers will be able to use the technologies to introduce novelties in pedagogy by becoming professionally

developed in AI literacy (Luckin et al., 2016). Nevertheless, numerous teachers are not yet ready to adopt AI with the lack of training, fear of losing their jobs, and fear of unreliability and transparency of AI-based technologies (Zawacki-Richter et al., 2019; Williamson and Eynon, 2020). Unless trained on AI engagement, institutionalized, and capacity building, there is the probability that AI will drive the workload of teachers and their stresses rather than support the process of instructional enhancement.

Sustainability is also another aspect of the challenge and opportunity. The AI can be used to enhance education sustainability by overseeing resources to boost efficiency, decrease dropout rates with the use of predictive analytics, and promote scalability in lifelong learning (Baker and Siemens, 2019). Eco-friendly educational approaches help to reduce physical infrastructure consumption, and cloud-based AI may help to achieve that. However, sustainable AI implementation is difficult. Financial, technological, and infrastructure needs of the AI systems might be prohibitive, especially in low-income areas (Chen et al., 2020). Big AI systems also use a lot of energy, which has become an environmental issue, and there is a need to plan well to ensure that technological progress does not come at the cost of the environment (Strubell, Ganesh, and McCallum, 2019).

The adoption of AI in digital pedagogies is a compound of opportunities and challenges in terms of accessibility, ethics, teacher preparedness as well as sustainability. AI has the potential to be adopted successfully to encourage inclusiveness, quality education, a personalized learning process, and sustainable learning activities. Simultaneously, it requires a close consideration of equity, moral governance, professional growth and environmental influence. This can be done by treating AI as a complementary resource to human educators, not its replacement, to make the most of technology to foster teaching and learning and be equitable, ethical, and sustainable in the process of technological progress.

IMPLICATIONS OF THE STUDY

The research concludes of this paper have profound educational practice, policy, and research implications, especially in the area of merging Artificial Intelligence (AI) with digital pedagogies. To start with, the opportunities of the AI to improve the teaching methods, student attention, and evaluation show the possibilities of changes in usual educational patterns. With AI, educators will be able to go beyond the one-size-fits-all concept and focus on different learner demands as it allows personalized, adaptive, and knowledge-based instruction. It implies the organizations need to invest in AI-based learning tools and Intelligent Tutoring Systems (ITS), provided the educators can interpret and use the data information to make pedagogical decisions (Woolf, 2021; Baker and Siemens, 2019).

Second, the research points to the role of offering unique learning experiences to students to promote their motivation, interest, and success. AI-driven adaptive systems and natural language processors can customize a content, a speed, and a feedback based on the preferences and abilities of a particular learner and the learning style (Chen et al., 2020; Luckin et al., 2016). It also has an impact on curriculum development because teachers can incorporate AI-based devices that deliver differentiated learning, scaffolded learning, and formative learning. The fact that AI could assist a disabled or language-deprived learner proves its possible ability

to encourage inclusivity and equal access and underlines the importance of schools and policymakers to embrace the assistive technologies and multilingual AI-based materials.

Third, AI application in the assessment procedure has certain implications on the efficiency and quality of evaluation. It can be done because it includes automated grading, real-time feedback, and the message collected by analytics, which will allow educators to start teaching higher-order competencies, i.e., critical thinking, problem-solving, and creative ones, rather than teaching by memorization (Baker, 2022; Heffernan and Heffernan, 2014). This means that the role of teachers will be transformed to be that of a facilitator of learning instead of being the traditional assessor the former can analyze the information produced by AI to shape the teaching practices.

Fourth, the research mentions ethical, accessibility, teacher preparedness, and sustainability in the responsibilities of an anti-immoral and successful introduction of AI in education. To reduce the possibility of AI expansion being used to create further disparities, organisations should come up with robust data privacy, transparency, and fair access policies (Williamson and Eynon, 2020; O'Neil, 2016). Teacher training and development is necessary to increase AI literacy, reduce anxiety, and allow teachers to perceive AI as a co-creative tool rather than as a threat to professional autonomy (Luckin et al., 2016; Zawacki-Richter et al., 2019).

And finally, there is a connotation on sustainable learning practices of the research. The AI is able to optimize the use of resources and support scalable learning models and improve learning long-term outcomes. However, there is a problem to be mentioned concerning the financial, infrastructural, and environmental factors, including the power consumption of AI systems in high proportions, to sustainability (Strubell, Ganesh, and McCallum, 2019). The article indicates that AI integration can bring change in teaching, learning, and assessment and fortify ethical, inclusive, and sustainable deployment. To create a more flexible, interactive, and non-discriminatory learning environment, researchers, policymakers, and educators must collaborate to create conducive environments to the AI applications and make sure that there is less adversity to such risks.

The issue of effective AI implementation means that it is necessary to restructure structural disparities in infrastructure and digital divide and developing institutions. Much of the bandwidth in lots of schools and colleges in the developing countries, teacher training and the affordability of EdTech solutions have their limitations too. This means that implementation structures must consider the local socioeconomic realities business in order to ensure that implementation is grounded on equity and not on technology. The policies should be oriented towards the upskilling of teachers and ethical data use as well as AI models which can react to their environment.

CONCLUSION

The present paper does not view Artificial Intelligence (AI) as the kind of intervention that will be contributed by the technology, but it is the catalyst that will assist in re-evaluating the instruction philosophy in the online learning environment. It derives a conclusion based on the research and states that AI can be applied to aid personalization, formative and, in parallel, estimate the ethical, equity, and sustainability outcomes. This novelty of the research will add

conceptual clarity to the existing debates on the human and machine collaboration in the learning field. The implementation plans to be applied in the future ought also to be concerned with the transparency, inclusiveness and capacity building of the teachers such that the AI is employed to boost human judgment and creativity, rather than to kill it. Further empirical and policy-oriented research is needed as the synthesis suggests in order to support ethical and future-ready education ecosystems. The issues, which confront the integration process of AI in view of whether it is ethical, whether it is biased, privacy of the data, the preparedness of the teachers and sustainability are also vital concerns that the study brings out. The best way to address these problems is to ensure that there are good policies, professional development designs and correct structuring of infrastructures that will lead to equal and accountable proceedings on the deployment. In addition to being a technological issue, the issue of AI integration into digital pedagogy is also a pedagogical one, and it can contribute to the adaptive, inclusive, and future-integrated education systems. AI is an interactive tool which when applied prudently can be used to multiply teaching, improve students as well as help achieve sustainable education. The study will be of benefit to policymakers, educators and researchers, who are interested in utilizing the potential of AI and mitigating the risks of the same.

REFERENCES

Baker, R. S. (2022). *Educational data mining and learning analytics*. Springer.

Baker, R. S., & Siemens, G. (2019). Educational data mining and learning analytics. In R. K. Sawyer (Ed.), *Cambridge handbook of the learning sciences* (pp. 253–274). Cambridge University Press.

Chen, L., Chen, P., & Lin, Z. (2020). Artificial intelligence in education: A review. *IEEE Access, 8*, 75264–75278. https://doi.org/10.1109/ACCESS.2020.2988510

Chen, X., Xie, H., & Hwang, G. J. (2020). A multi-perspective study on artificial intelligence in education: Trends and challenges. *Computers & Education, 146*, 103751.

D'Mello, S., & Graesser, A. (2015). Feeling, thinking, and computing with affect-aware learning technologies. In S. A. C. Graesser et al. (Eds.), *The Cambridge handbook of computing education research* (pp. 419–451). Cambridge University Press.

Graesser, A., Hu, X., Nye, B., & Person, N. (2018). AutoTutor: An intelligent tutoring system with mixed-initiative dialogue. *IEEE Transactions on Education, 59*(1), 7–14.

Heffernan, N., & Heffernan, C. (2014). The ASSISTments ecosystem: Building a platform that brings scientists and teachers together for minimally invasive research on human learning and teaching. *International Journal of Artificial Intelligence in Education, 24*(4), 470–497.

Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. Boston: Center for Curriculum Redesign.

Holmes, W., Porayska-Pomsta, K., & Holstein, K. (2021). Ethics of AI in education: Towards a community-wide framework. *International Journal of Artificial Intelligence in Education, 31*(4), 687–704.

Ifenthaler, D., & Yau, J. Y. K. (2020). Utilising learning analytics for study success: Reflections on current empirical findings. *Research and Practice in Technology Enhanced Learning, 15*(1), 1–13.

Loewen, S., Isbell, D. R., & Sporn, Z. (2019). The effectiveness of app-based language instruction for developing receptive linguistic knowledge. *Foreign Language Annals, 52*(4), 779–798.

Luckin, R. (2018). *Machine learning and human intelligence: The future of education for the 21st century*. London: UCL IOE Press.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence unleashed: An argument for AI in education*. Pearson Education.

O'Neil, C. (2016). *Weapons of math destruction: How big data increases inequality and threatens democracy*. Crown.

Pane, J. F., Steiner, E. D., Baird, M. D., & Hamilton, L. S. (2015). *Informing progress: Insights on personalized learning implementation and effects*. RAND Corporation.

Selwyn, N. (2019). *Should robots replace teachers? AI and the future of education*. Polity Press.

Siemens, G., & Long, P. (2011). Penetrating the fog: Analytics in learning and education. *EDUCAUSE Review, 46*(5), 30–40.

Strubell, E., Ganesh, A., & McCallum, A. (2019). Energy and policy considerations for deep learning in NLP. In *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics* (pp. 3645–3650).

Williamson, B., & Eynon, R. (2020). Historical threads, missing links, and future directions in AI in education. *Learning, Media and Technology, 45*(3), 223–235.

Woolf, B. P. (2021). *Building intelligent interactive tutors: Student-centered strategies for revolutionizing e-learning*. Morgan Kaufmann.

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education. *International Journal of Educational Technology in Higher Education, 16*(1), 39.

Zhai, X., Chu, X., Wang, M., & Chen, W. (2021). A systematic review of automated essay scoring in Chinese language education. *Journal of Educational Technology Development and Exchange, 14*(1), 1–24.

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REDEFINING ACADEMIC SUPPORT: ALIAH UNIVERSITY LIBRARY AND THE DEPARTMENT OF EDUCATION IN LIGHT OF NEP 2020

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ABSTRACT

National Education Policy (NEP) 2020 has envisioned a transformational shift for India's education system with an emphasis on holistic, interdisciplinary learning based on research, innovation, and technology. This paper explores the functions and responsibilities of the Aliah University Library and Department of Education in accordance with NEP 2020, and positions the university library as a partner in quality teacher training, digital literacy, and research orientation. Drawing from literature reviews and institutional perspectives, the paper highlights that the sustainable education transformation that is guided by NEP 2020 necessitates strategic collaboration between academic libraries and education departments for lifelong learning, equity, and professional excellence.

Keywords: Aliah University, NEP 2020, academic libraries, digital literacy, multidisciplinary learning, educational transformation

1. INTRODUCTION

The National Education Policy (NEP) 2020, adopted by the Government of India, foresees an integrated, holistic, and nimble education system that focuses on critical thinking, research, multilingualism, and technology-based learning. In this context, the position of universities in developing innovation and academic excellence becomes central. Libraries, being the intellectual centers of universities, are responsible for achieving these goals by linking learners to knowledge systems and developing research capabilities. This study is a case study of Aliah University that used document analysis of NEP 2020, university resources, and peer-reviewed literature in order to understand NEP 2020 shifts libraries from passive resource centers to active digital learning and research enablers. And it is expected to support multidisciplinary learning, open educational resources (OER), and technology-enabled knowledge generation. And hence, libraries are now integral to institutional rankings, accreditation, and research output. However, there is limited scholarly evidence on how university libraries are practically translating NEP 2020 directives into sustainable knowledge and research support systems.

Aliah University, founded by the West Bengal Act XXVII of 2007, is a contemporary teaching and learning environment that is committed to inclusive education, professional development of teachers, and research quality. Aliah University is a suitable case as it rapidly developing university which serves a diverse, first-generation learner base and reflects real challenges of mid-tier Indian institutions adapting to NEP. Its education department and central library are

twin pillars of pedagogic innovation in support of NEP 2020's equity, quality, and lifelong learning objectives.

2. Aliah University: An Institutional Overview

Aliah University, as a legacy of the Mohammedan College of Calcutta established in 1780, was transformed into a modern state university in 2008. Aliah University wishes to link classical knowledge with new disciplines and be a part of NEP 2020's multidisciplinary approach. The university campus has well-equipped laboratories, a Wi-Fi setup, and a fully air-conditioned AC library with collections in education, science, engineering, arts & humanities, nursing and law.

2.1 Library Profile

The Aliah University Central Library is an extensive academic resource center, harmonizing both printed and electronic collections to facilitate teaching, learning, and research in all disciplines. The circulation policy enables faculty members to borrow books for two months, postgraduate students for twenty days, and undergraduates for fourteen days to ensure equal access and effective use of the resources. The library has subscriptions to Turnitin and Drillbit anti-plagiarism software, a collection of e-books, 02 academic databases, and around 13,000 plus online journals through One Nation One Subscription (ONOS), 08 newspapers on different languages as well as access to the millions of resources under Digital Library of India which can be accessed along with a number of other national depositories. With its heavy focus on user-centered services, the library itself encourages academic integrity, research excellence, and inclusive learning by delivering multilingual and multimedia resources closely aligned with the vision of the National Education Policy (NEP) 2020.

2.2 Department of Education at Aliah University

In 2014, the Department of Education was established to offer NCTE-approved B.Ed., M.A., and doctoral programs based on research-oriented teacher education. The Education Department of Aliah University combines disciplinary knowledge with pedagogical innovation in language education (Arabic, Urdu, English, Bengali), mathematics, science, and social sciences and reflects NEP 2020's aim to produce professional and ethical teachers who can create critical, inclusive, and technology-enabled classrooms. The pedagogy of the department includes ICT-enabled interactive teaching, blended learning, and ICT-mediated learning, which effectively captures NEP 2020's focus on digitalization and competency-based education.

3. OBJECTIVES OF THE STUDY

i) To analyze how Aliah University's Central Library supports academic innovation aligned with NEP 2020.
ii) To assess its infrastructure, services, and digital readiness.
iii) To identify challenges and future pathways for enhancement.

4. LITERATURE REVIEW

Several studies examined the evolving function of university libraries and teacher education programs after NEP 2020. Libraries are dynamic places of digital learning and research, and Bhardwaj and Sharma (2023) argue that their inclusion within academic departments fosters innovation and lifelong learning. The IP Indian Journal of Library Science and Information Technology (2023) emphasize the role of the academic library in achieving the objectives of NEP, including multilingualism, digital literacy, and research collaboration.

Similar transformations are observed in the United Kingdom, with the Teaching Excellence Framework (TEF) driving universities to show better research support for students, digital information literacy, and open-access publishing infrastructure, all of which have become a more significant role of academic libraries (Jones and Harper, 2023). For example, Downes and Martin (2024) discuss that the recent teacher education reforms in Australia demand academic libraries to provide embedded information-skills curricula and practice-based learning models, which mirror the ICT-enabled pedagogy and field-linked academic training promoted by NEP 2020. Likewise, Canadian studies highlight the integration of learning commons models that combine digital services, research consultancy, instructional design support, and faculty development under a single unified academic framework (Wilson and Graham, 2022). This demonstrates that the emphasis on academic libraries under NEP 2020 is in line with broader international trends.

The NEP also reshapes teacher education, requiring an integrated four-year B.Ed. program by 2030 with greater focus on research, practice, and the application of ICT in teaching. As a result, university libraries need to transform as "learning commons," providing digital access, research assistance, and continuing professional development for both students and faculty.

The relationship between libraries and education departments thus becomes mutually dependent—libraries offer intellectual infrastructure, while the education departments develop human resources that use those facilities for knowledge creation and sharing.

5. NEP 2020: Framework and Implications

NEP 2020 reorganized education along the lines of the 5+3+3+4 model, facilitating flexible, interdisciplinary curricula, vocationalization, and digital competencies. It suggests the creation of a Higher Education Commission of India (HECI), the National Research Foundation (NRF), and the National Educational Technology Forum (NETF) to re-orient pedagogic experiences and research sponsorship. The policy focuses on several radical goals that are closely connected to university libraries and education departments these may be:

i. Open and digital learning programs by providing institutional access to e-books, e-journals, databases, MOOCs, and digital repositories, which enable flexible learning beyond classroom schedules.
ii. Pedagogy of research by offering research databases, citation tools, and access to peer-reviewed journals to support scholarly writing and evidence-based study. The research support services such as plagiarism checking, referencing guidance, information

literacy workshops, and research consultations. And maintaining institutional repositories for archiving dissertations, faculty publications, and research data, thus creating academic visibility.

iii. Indian language promotion by developing multilingual collections including textbooks, literature, reference works, and academic materials in regional and classical Indian languages, facilitating Indian language by subscribing to vernacular journals, newspapers, and research periodicals and providing bilingual cataloguing and metadata, helping students search and retrieve materials in Indian languages.

iv. Professional development and mentorship on a continuing basis by conducting workshops and training sessions on ICT tools, plagiarism handling, copyright, academic writing, research metrics, and digital teaching aids. And to support for faculty publications and citation impact, including guidance on publishing ethics, journal selection, indexing, and research visibility

The blending of these goals necessitates institutions such as Aliah University using their library systems to facilitate cross-disciplinary work and faculty-student interaction.

6. The Role of Libraries Under NEP 2020

According to the Indian Journal of Library Science and Information Technology, libraries play a central role in the adoption of NEP 2020 because they form the basis for access, equity, and quality in knowledge sharing.

i. Facilitating Digital and Multilingual Learning

Digital literacy as emphasized by the NEP necessitates that libraries shift from physical collections to digital libraries, e-journals, and databases. The Aliah University expanding digital infrastructure has its library supporting these objectives, offering readers access to e-books, databases, and online scholarly networks. Empirical evidence indicates that India's school and higher-education libraries' transformation is more ICT integration and digital literacy oriented, as envisaged by NEP. For instance, Gupta & Singh (2025) analyse how ICT is altering school libraries in the NEP 2020 environment. In addition, Sumi & Kumar (2023) explain how digital library architectures facilitate inclusive learning and multilingual access in NEP 2020.

ii. Supporting Research and Innovation

NEP 2020 encourages research environments, and libraries are expected to set up digital repositories and research-support systems, for example, through joint programs between Aliah University Library and teachers to support research, citation management, and access to specialist databases. Libraries are not directly mentioned in NEP 2020, but they can play a key role in achieving its goals, such as e-learning, lifelong learning, and quality research (Thapa, 2022); Rathod (2025) highlights the need for formal librarian–faculty collaboration and digital literacy guidelines to fully support research and innovation enabled by NEP.

iii. Promoting Teacher Education and Professional Growth

Faculty in the Department of Education turn to the library for everything from teaching strategies and curriculum planning to research-backed training. This lines up with NEP's push for teacher education built on data and real evidence, not just theory. Lamani and Rathod (2021) point out that libraries shape learning across all levels, from preschool to higher education. They also play a big part in helping teacher-librarians grow professionally, which is exactly what NEP 2020 envisions.

iv. Encouraging Lifelong and Community Learning

Encouraging Lifelong and Community Learning NEP 2020 sees libraries as more than just quiet study spots—they're hubs for community knowledge, open after hours and running outreach programs. Aliah University Library really embraces this idea. They connect with the community, support literacy, and make digital technology more accessible beyond the campus. According to Pusadkar and Fating (2023), libraries stand right at the crossroads of education and information in NEP 2020, driving digital inclusion, multilingual learning, and lifelong education through services that center on the community.

7. Integration of the Library with Department of Education

Aliah University Library and the Education Department work hand in hand, both aiming to boost teaching, research, and broad learning. Teachers use the library for lesson planning, micro-teaching tools, and digging into the curriculum. They lean on these resources to make their classes better, which fits right in with NEP's push for results-driven learning.

Joint workshops, demo classes, and online literacy sessions bring students and teachers together for mentorship and training. This teamwork makes sure future teachers get hands-on experience, using resources for reflective teaching that match NEP 2020's focus on inclusive teacher growth. The table below shows how many people visited the library each year from 2018-19 to 2022-23. In 2020-21, visits dropped sharply because COVID kept people from coming in person.

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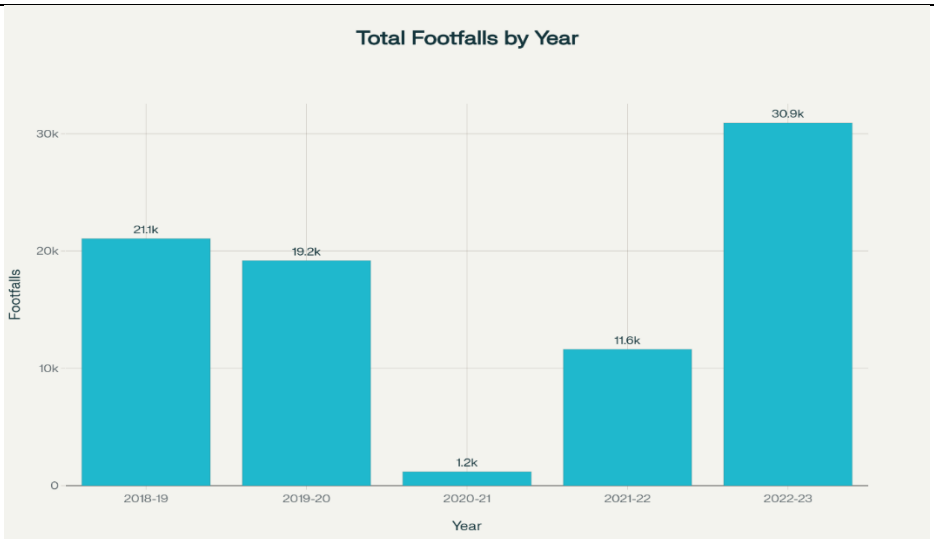
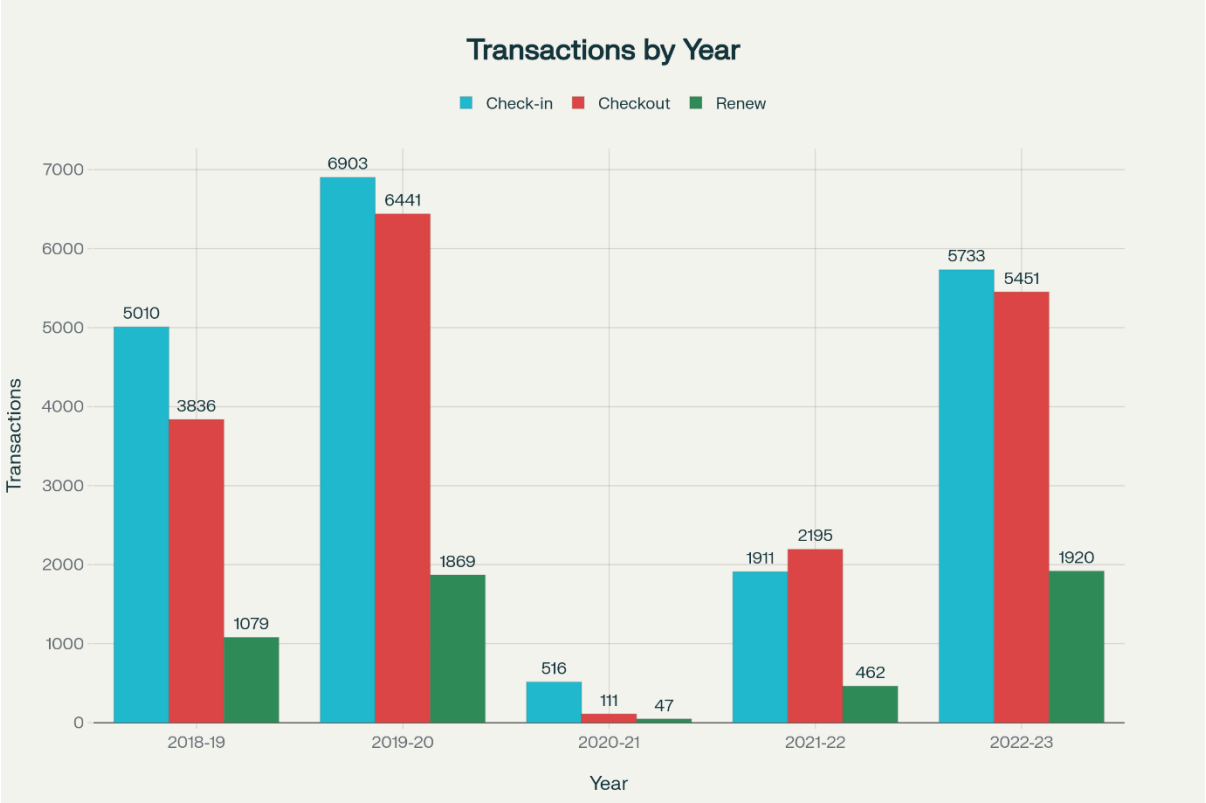


Source: Student visitor register of AU-Park Circus library



Source: Koha Internal LMS Year-wise Circulation Data (2018-19 to 2022-23)

8. FINDINGS AND DISCUSSION

i. Institutional Synergy: At Aliah University, the library and the Department of Education actually work together, not just on paper. You can really see NEP 2020's push for blending different fields and sharing knowledge in how these two team up.

ii. Digital Readiness: The university isn't just talking about going digital—it's doing it. Shifting to e-learning platforms brings NEP's digital goals to life on campus.
iii. Inclusivity and Multilingualism: Walk into the library and you'll notice shelves lined with books in several languages. The space is designed so everyone feels welcome, which directly supports NEP's drive for equity.
iv. Research Culture: Teacher prep programs use open-access materials, making research more accessible. This hands-on approach pushes students to think deeper and really get into inquiry-based learning.

9. Recommendations

i) Strengthen digital infrastructure by expanding e-resource access and online learning platforms.

NEP 2020 wants technology-enabled learning and digital inclusion; libraries need to step up their digital game. That means more than just a fresh coat of paint—they've got to upgrade institutional repositories, add more e-resources, databases, and e-journals, and make sure remote learners aren't left out. Smooth access through online learning systems is essential. Federated search platforms help people find what they need without jumping through hoops, and it's all pointless without fast, reliable internet and good data management. Keep investing, and the library stays the heart of academic life—even as everything moves online.

ii) Build a research consortium between the library and the education department for collaborative projects.

A joint research consortium between the library and the Department of Education is a smart way to boost interdisciplinary research and real evidence-based teaching. Imagine faculty, research scholars, and trainee teachers all working together, using the library's digital repositories, bibliometric tools, and citation managers. Host workshops on research design, academic writing, and open-access publishing. This ramps up research productivity and keeps communication on par with international standards. Plus, collaborating like this supports the National Research Foundation's push for cross-disciplinary innovation.

iii) Implement digital literacy training for trainee teachers.

Trainee teachers need solid digital skills to thrive in NEP 2020's tech-driven landscape. Libraries should roll out hands-on modules on using digital resources, handling information ethically, citation management, and academic research tools. Plug these sessions into teacher training courses, and get librarians and education faculty working side by side to lead them.

iv) Expand multilingual and open-access collections.

NEP 2020 talks a big game about linguistic diversity and inclusivity—libraries have to walk that talk. Build up collections in regional, national, and even international languages. Digitize fragile manuscripts and local works so nothing gets lost. Make sure students can access materials in their own language. Strengthen open-access repositories so research outputs are

easy to find and share, inside and outside the institution. Partnering with platforms like the National Digital Library of India and INFLIBNET's Shodhganga makes these efforts go even further.

v) Develop metrics to measure the impact of the library's contributions to teacher education outcomes.

Libraries need to set clear benchmarks—both numbers and stories—to show their impact on teacher education. Track things like how often faculty work with library staff, how much students use online resources, participation in literacy programs, and the library's role in sparking new teaching ideas or research. Use regular assessments, feedback surveys, and data analysis to spot what's working and what needs a tweak. Tie these metrics to institutional accreditation and NEP 2020's standards, so the library's real value gets recognized and woven into the broader education system.

10. CONCLUSION

The Aliah University Library stands at the heart of the Department of Education's work, right alongside NEP 2020. By pushing for inclusivity, digital skills, and a real focus on research, the university shows just how important libraries are in India's changing education scene. The future of teacher education isn't just about following rules—it's about building lively spaces where libraries spark new ideas, drive learning, and help move society forward.

REFERENCES:

Aliah University. (n.d.-a). Department of Education. https://aliah.ac.in/department/education

Aliah University. (n.d.-b). Aliah University Library System. https://aliah.ac.in/department/central-library

Aliah University. (n.d.). Central Library — E-Journal and E-resources statistics. Aliah University. https://aliah.ac.in/department/cms-page.php?key=central-library&page_key=e-journal. Aliah University

Government of India, Ministry of Education. (2020). *National Education Policy 2020*. https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English_0.pdf. Education Ministry of India

Bhardwaj, P., & Sharma, R. (2023). *Role of academic libraries in digital learning and research under NEP 2020*. Indian Journal of Library Science and Information Technology.

IP Indian Journal of Library Science and Information Technology. (2023). *Academic libraries and the National Education Policy 2020: Opportunities and challenges.*

Gupta, M., & Singh, R. (2025). Transforming school libraries with ICT: Assessing digital literacy and the evolving role of librarians in the context of NEP 2020. *LIS TODAY, 10*(2), 26-36. https://doi.org/10.48165/lt.2024.10.2.4

Lamani, M. G., & Rathod, M. S. G. (2021). New Education Policy 2020: Role of libraries. *International Journal of Research in Library Science (IJRLS), 7*(3), 166-171. https://doi.org/10.26761/IJRLS.7.3.2021.1436

Pusadkar, A. V., & Fating, P. P. (2023). Connecting education and information: A new era under NEP 2020. *ShodhKosh: Journal of Visual and Performing Arts, 4*(2). https://doi.org/10.29121/shodhkosh.v4.i2.2023.4023

Rathod, M. S. G. (2025). Transforming academic libraries for inclusive and digital-first higher education: A comparative study of policy, practice and innovation in India and the United States. *Asian Research Journal of Arts & Social Sciences, 23*(8), 221-231. https://doi.org/10.9734/arjass/2025/v23i8761

Sharma, S., & Abbas, Q. (2024). Role of libraries in the preservation, dissemination and integration of Indian knowledge systems: A NEP 2020 perspective. *Infopreneurs: Library Professionals Journal of RTLA, 1*(2), 8-13.

Soni, M. (2023). A literature survey on National Education Policy 2020 (NEP 2020) and libraries. *Journal of Learning and Educational Policy, 3*(04), 13-23. https://doi.org/10.55529/jlep.34.13.23

Sumi, S., & Kumar, J. (2023). Integrating digital libraries into the framework of National Education Policy 2020. In *Vyom Hans Press* (Vol. 9, Chapter 87). https://doi.org/10.34256/vadlibs.25.13.157

Thapa, N. (2022). NEP 2020: Pivotal role of libraries in achieving the goals. *International Journal of Research in Library Science (IJRLS), 8*(4), 168-175. https://doi.org/10.26761/ijrls.8.4.2022.1587

Joorel, J. P. S. (2023). Envisioning digital transformation in libraries for next-gen academic landscape. *DESIDOC Journal of Library & Information Technology, 43*(1). https://doi.org/10.14429/djlit.43.01.18857

Jones, A., & Harper, B. (2023). *Digital research support and learning environments in UK academic libraries under the Teaching Excellence Framework*. *Journal of Library Innovation*, 14(2), 123–145.

Downes, C., & Martin, D. (2024). *Transforming teacher education: Embedded information literacy and practice-based learning in Australian universities*. *Australian Journal of Educational Research*, 50(1), 67–89.

Wilson, E., & Graham, F. (2022). *Learning commons and faculty development in Canadian university libraries: A model for integrated academic services*. *Canadian Journal of Academic Librarianship*, 11(4), 301–321.

INFLIBNET Centre, Ministry of Education, Govt. of India. (n.d.). *ONOS | India*. https://www.onos.gov.in/#:~:text=About%20ONOS,Institutions%20of%20the%20central%20government.

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Financial Education is the pathway to Financial Inclusion and Financial Well-Being: A Qualitative Narrative Review

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ABSTRACT

In developing nations, financial literacy is crucial for improving financial inclusion and overall financial health. This study employs a qualitative narrative literature review to investigate the causal relationship among financial literacy, financial behaviour, and digital capabilities. Researchers look at the different parts of financial literacy to see how financial education can affect financial inclusion, financial well-being, and the growth of businesses. The evaluation also underscored the significance of financial literacy among youth and women, illustrating its role in fostering sustainable financial practices and the utilisation of digital financial services. The study further examined the dissemination of financial literacy across diverse demographic segments categorised by gender, age, education, and income. A critical analysis of financial education policies in India demonstrated their impact on individuals' self-efficacy. The study asserts that financial literacy improves financial inclusion by facilitating informed financial decision-making, fostering prudent financial behaviour, and encouraging the utilisation of formal financial services. Improved financial inclusion has a positive effect on financial well-being by lowering financial stress and making people more financially resilient. Financial self-efficacy is a middleman in this relationship. The review indicates the necessity for a holistic policy framework that incorporates financial education into educational curricula, workplace training, and the promotion of digital learning platforms, thereby addressing the requirements of both conventional and digital competencies.

Keywords: Financial Behavior, Financial Education, Financial Inclusion, Financial Literacy, India.

1. INTRODUCTION

Financial literacy is a key factor for economic growth and development. In this digital era, it is important to safeguard people from financial risk. This is one of the paths that equips people with the tools and techniques to enhance their financial self-efficacy that enhances the capability for informed financial decisions. It is seen as an essential, thus, considered as a part of education by the policymakers (OECD, 2014). In India, the Reserve Bank of India has taken Financial Inclusion and Education as the key elements for its developmental role. They have created a volume of literature for banks and other stakeholders to use them for financial literacy training. The aim of this initiative is to impart awareness on various financial products and services and consumer protection. It also encourages people to accept good financial practices and adopt fintech. This is in line with the development of educational curricula that develops

economic citizenship where children and adolescents can realize their potential as a citizen towards financial empowerment and capability (CYFI, 2013). Studies show that lack of financial literacy put people into poor credit situation. It is indicated by accumulation of excessive debt, using credit with high interest rates, inappropriate mortgage selection, experiencing repayment difficulties or even foreclosure (Hastings, 2013).

Despite the growing policy interest, financial literacy remains is still have scope to be inclusive. It has been observed that the extent of financial literacy is varied on different demographic segments, predominantly among women, youth and low-income groups. They are identified as vulnerable to the financial risk and poverty. This acts as a barrier for financial inclusion and hinders the economic growth and development. To bridge this gap, an in-depth study of various dimensions of financial literacy is needed along with its determinants and its policy implications.

Purpose and Research Questions:

The purpose of this qualitative narrative review study is to assess the theoretical framework on the inter-relationship of financial literacy, financial inclusion, financial well-being, financial self-efficacy, and entrepreneurship. The research questions addressed in this paper are as follows:

- How the various dimensions of financial literacy influence financial inclusion and financial well-being?
- What demographic and socio-economic factors moderate the relationship of financial literacy with financial inclusion and financial well-being?
- How financial education policies strengthen financial literacy as a tool for empowerment entrepreneurial development?

2. METHODOLOGY

This paper is built on a qualitative narrative literature review approach. Review of published journal articles and policy documents are studied to focusing on developing countries specially in Indian context. The link between financial literacy and financial inclusion, financial well-being and entrepreneurship is analyzed thematically to identify the concepts, theoretical frameworks and policy implications. The analysis followed the IMRaD framework to ensure the logical flow of the study.

3. Results and Thematic Findings

3.1 Definitions and Dimensions of Financial Literacy

Financial literacy is defined as the skills and knowledge of individuals to make informed decisions about personal finance including planning, budgeting, saving, investing, borrowing

that lead to better economic outcomes (Tohar & Akron, 2025). This is a multi-dimensional concept with three core conditions, financial knowledge, financial attitude and financial awareness. Financial knowledge refers to the understanding of basic financial concepts such as compound interest, time value of money, inflation, risk diversification, budgeting etc. (Lusardi & Mitchell, 2023).

Similarly, financial attitude exhibits the preference for the financial product and services. Whereas, financial awareness considers the familiarity with the formal financial products and services. It focuses on the long-term perspective about financial risk and planning (Tohar & Akron, 2025). In this context, digital financial literacy is another concept where primarily mobile and internet is the mode for usage of the financial services (Lyons & Kass-Hanna, 2021).

Measurement of financial literacy is often involved with objective tests where questions are assessed. On the contrary, subjective assessment is done for the same on financial experiences and perceptions. Big Three and Big Five Questions (Lusardi & Mitchell, 2023) in combination is one of the objective measurements where multiple-choice questions or true and false are asked on compound interest, inflation, and risk diversification. Financial Literacy Indices is a multi-dimensional index, integrates financial knowledge, attitudes, behaviors, and digital skills and prepares composite scores or multidimensional indices (Lyons & Kass-Hanna, 2021). Another measurement tool is Item Response Theory (IRT) where a psychometric approach is taken to develop to assess the financial literacy level (Hauff et al., 2020). Although, in the absence of a standard definition and instrument, comparison of financial literacy is a challenge (Ouachani et al., 2021).

3.2 Financial Literacy as a Driver of Financial Inclusion

Financial literacy is associated with improved financial behavior evident through informed financial decision-making related to saving, investing, and borrowing (Khan et al., 2022). Therefore, the intervention of financial literacy improves financial behavior and mitigates risky behavior. Financial inclusion is defined as the access and usage of suitable financial products and services in a formal financial institute (Morgan & Long, 2020). In the context of India as a developing country, financial literacy enhances financial inclusion by channelizing personal banking and finance in formal financial institutions such as savings accounts, credit, payments, and insurance. Apart from access and usage, financial awareness which is defined as the awareness about the various financial products and services, that is driven by financial literacy. Financial literacy is one of the prerequisites for financial inclusion that enables one with the understanding for efficient use of finance. There are studies highlighted the significant impact of financial literacy on financial inclusion. Better financial literacy leads to higher savings and better credit usage (Morgan & Long, 2020). Subsequently, it reduces the financial risk through positive financial behavior that promotes financial inclusion. Financial literacy positively

correlated with financial behaviors including budgeting, saving, investing, and borrowing (Dewi et al., 2020).

3.3 Financial Literacy and Financial Well-being

Financial literacy is correlated with financial well-being that reduces financial stress, and fosters positive financial behaviors (Khan et al., 2022). Financial well-being as defined by many researchers exists where individuals get the financial security and resilience to meet the financial obligations which are presently exists and which are coming in future. There is an association between financial inclusion and financial well-being. Financial inclusion improves the financial health of individuals through smooth consumption and wealth accumulation. Consequently, it improves satisfaction and reduces financial stress through the access of appropriate financial products and services. In a holistic view, financial literacy improves the financial well-being of the people so that they can maintain their living standards and build up resilience for future financial risks, and mitigate the financial stress. Positive financial habits and literacy reduce the financial stress and contribute to perceived financial security, while financial stress negatively influences financial well-being (Rahman et al., 2021).

3.4 Demographic variations in Financial Literacy

A lack of financial knowledge is prevalent among people of different ages and geographical areas (OECD,2005). Financial literacy varies on the demographic factors gender, age, education, income, and ethnicity. It is observed that women, youth, and low-income groups often exhibited low financial literacy contributing to inequality in financial inclusion and outcomes.

Age typically shows a hump-shaped curve indicating that financial literacy increases with age and experience but it declines in elderly population. They have low financial literacy. Within the middle-aged population, it was found to be highest (Hauff et al., 2020; Lusardi & Mitchell, 2023). Emerging generations display distinct financial cognition where short term financial attitude and low level of long-term financial (Ouachani et al., 2021) implication is evident (Tohar & Akron, 2025). Extensive use of fintech by the youth population is evident which is actually for digital literacy and technology adoption factor (Lyons & Kass-Hanna, 2021), compensating their financial knowhow.

In the study of gender, women found to score low in objective financial literacy tests. This low score is often linked with low confidence and non-responsiveness (Andriamahery & Qamruzzaman, 2022).

The formal education has strong association with financial literacy. People with higher degrees have better financial literacy. Similarly, people in higher income levels also exhibit greater financial literacy (Dewi et al., 2020). In another observation, it is found that socialization has

an impact on financial literacy affecting the financial knowledge and behavior (Khan et al., 2022).

3.5 Financial Literacy, Entrepreneurship, and Empowerment

Financial literacy promotes entrepreneurship among youth and women, enhancing their empowerment through entrepreneurial development and responsible financial behavior (Bilal et al., 2021). Financial knowledge has a significant impact on empowerment of women through entrepreneurial development. It also impact on the financial self-efficacy of the targeted population. This is visible when more people are accessing their personal finance and managing it by own. This enhanced financial inclusion on the women for entrepreneurship which is instrumental in increasing financial empowerment (Solesvik, 2019).

3.6 Financial Education and Sustained Positive Financial Behavior

The OECD (2014) has defined financial education as an activity to develop financial literacy. It plays a key role in improving financial literacy by enabling individuals to plan their budget, manage their income, wisely save and efficiently invest their money, and most importantly protect themselves from any kind of financial frauds. Financial education ultimately aims to equip and motivate people to adopt good financial practices and manage their finance responsibly that enables that to informed financial decision making. It can lead to a sustainable financial behavior. It not only increases the knowledge of the people; it also effects the psychological and behavioral aspect of the people. It mitigates the gap between what people's knowledge and actions. It is evident that financial education has a positive effect on self-efficacy that develops the confidence level of the people for informed financial decisions (Tehran et.al., 2025). By encouraging the small actions, it develops good financial habits like regular saving, budgeting, and borrowing money with proper evaluation. Financial education combing with social norms and accessible financial tools. That can be noticed in positive financial behaviors that persists beyond the learning context (Tatad et. al., 2024).

Financial literacy improves when financial education is delivered through various levels and modes. There are studies which have evaluated the impact of financial-literacy education by reporting its effect on financial knowledge, behavior, attitude, level of confidence (Amagir, 2018). Evidence also suggested that mandatory financial education in school curriculum can enhance the financial literacy of the youth people. It can have a substantive effect on them in comparison to the effect of delivery in after-school voluntary programs (Frisancho, 2019). The early start of financial education can impart financial literacy among youth, Gen Z to be specific, and are effective as they can carry on the outcome through lifelong financial habits. In fact, it is more effective when parental involvement is higher (Campenhout, 2015). A positive outlook for the financial with a purposive financial behavior and self-efficacy and control expected to be the outcome of the program. On the contrary, adult financial education

programs in the workplace have a positive effect on the employee's ability for retirement planning, saving, and investing (Lusardi & Mitchell, 2023).

Inclusion of financial education as a compulsory course into the pedagogy of the school. By including it in its curriculum ensures that students get engaged in a continuous learning process. The focus of financial education mainly to cover the concepts of budgeting, saving, spending, and credit. In some programs, topics such as investment and the usage of banking services are also included. Review of financial education programs shows that the core concepts addressed by these programs are similar across countries (Amagir, 2018).

Although there are studies that emphasized that financial education may not have a significant impact on financial behavior. Courses like management of personal finance at the high school level had no significant impact on financial literacy, attitudes, or behavior of the students. However, being a full-time college student or graduate was associated with positive financial behavior (Mandell, 2009).

The Self-Determination Theory is also applicable to financial-literacy education as its primary concern is to promote students' autonomy and competence. Here autonomy refers to the control of the learning process. On the other hand, competence captures an individual's perception of being capable and effective within their social environment. This idea is linked to self-efficacy which is defined as individuals' judgment on his capabilities to organize and carry out actions necessary to achieve a desired level of success (Bandura, 1993). In this line, the focus of financial-literacy education is not limited to teaching the financial concepts, rather on improving self-confidence that will lead to positive financial behavior (Walstad, 2010).

Policymakers believe that financial education can overcome the incidents where people take poor financial decisions due to their limited financial knowledge. Thus, governments run financial literacy programs for the user level as they realize that financial education may have a delayed impact or be more effective when students are older and more financially responsible (Hilgert, 2003). The Government of India through Reserve Bank of India developed tailored financial literacy content for the trainers in financial literacy programs. It is specifically for target groups like farmers, small entrepreneurs, school children, self-help groups, senior citizens. Apart from basic financial literacy, it emphasizes digital payment services like unified payment interface (UPI) transfer and quick response (QR) based payment systems.

4. DISCUSSION AND POLICY IMPLICATIONS

This study hypothesizes that financial literacy is enhancing financial inclusion and financial well-being. It brings economic empowerment through entrepreneurial development. In India, embedding financial education into the formal curriculum in the formal education system can bring the success of financial literacy programs. Apart from it the community-based learning is another effort that can increase the financial literacy. In this digital era, fintech is one of the platforms that mitigate the availability and accessibility gap to the unserved population. To

leverage the technology platform, it is essential that people should have the acumen to use fintech. Thus, integrating digital financial awareness in financial literacy policy framework is crucial for the overall success of the financial literacy program. An overall policy framework on financial literacy, can target the disadvantaged segment that includes women, youth and rural populations. There is a demand for a standardized, culturally accepted, and multi-dimensional financial literacy assessment tool incorporating both the traditional and digital proficiency. To reserve the cultural aspect the traditional education, need to kept along with the digital skill upgradation. The field of financial literacy is evolving towards digital financial literacy to leverage fintech as a critical path towards overall success of the financial literacy policy (Lyons & Kass-Hanna, 2021).

Sophisticate measurement models are being used to capture the multidimensionality of financial literacy and its long-term outcomes (Hauff et al., 2020). The causal relationship between financial literacy and improved economic condition through positive financial behavior can be established thoroughly. Further research can be done to explore the mediating role of financial attitude, behavior and stress controlling on gender and socio-economic conditions can be a groundbreaking approach. Policy implications of financial literacy emphasize on early education but are continuous and tailor-made to address the specific demographic segment (Rahman et al., 2021).

Financial Education Policy implications for India need to be synched with existing national programs such as PMJDY (Jan Dhan), the National Strategy for Financial Education (NSFE 2020–25), RBI–NCFE initiatives, and the rapid expansion of UPI/QR-based digital payments. To translate knowledge into sustained behaviour, financial education must be delivered in local languages, using pictorial and audio formats for low-literacy groups, and engagement of bank correspondents, post offices, Self Help Groups, and most importantly banks and micro finance institutes. To ensure that financial education leads to sustained positive financial behaviour, financial education programs must incorporate principles of Self-Determination Theory (SDT) by strengthening autonomy, competence, and relatedness (Charles R. Chaffin EdD, 2018). Hands-on digital onboarding by showing users how to install UPI apps, verify QR codes, adopt the safety measures and identify spams and frauds, should be mandatory. Behavioural nudges such as automated small savings transfers, SMS reminders, and goal-tracking messages can strengthen habit formation. Finally, monitoring under NSFE should track not just knowledge but self-efficacy, confidence, usage of formal financial services and safe digital practices, ensures India's financial literacy efforts to a long-term policy goal where people can participation in the formal financial system.

5. CONCLUSION

Financial literacy has a key role in enhancing individuals' financial self-efficacy, equip them for financial decision making that supports greater financial inclusion. When people effectively utilize formal financial services, they are in better position to save money and accumulate a

fund. Their reliance on formal financial institution has a positive effect in improving the financial resilience of target population. It safeguards people from financial stress which is evident in better financial well-being.

In this financial landscape, digital capability plays an equal important role in enhancing the financial well-being of the people. People need to develop their digital financial skills to leverage the benefits of fintech. This study highlighted the interdependence of finance and digital technology and demands the need for a combination of financial literacy and digital literacy. This effort is essential for improving the adoption rate of digital technology and to protect the interest of the vulnerable population.

This synchronized effort is essential to achieve an inclusive and sustainable financial development. Bu enhancing self-efficacy and empowering people to participate meaningfully in the formal financial system, can contribute to the economic growth. Effective financial education goes beyond imparting knowledge. They must address both cognitive and non-cognitive factors to cultivate rational, confident and sustainable financial behavior.

REFERENCE

Amagir, A., Groot, W., Maassen van den Brink, H., & Wilschut, A. (2018). A review of financial-literacy education programs for children and adolescents. In *Citizenship, Social and Economics Education* (Vol. 17, Issue 1, pp. 56–80). SAGE Publications Inc. https://doi.org/10.1177/2047173417719555

Andriamahery, A., & Qamruzzaman, M. (2022). Do Access to Finance, Technical Know-How, and Financial Literacy Offer Women Empowerment Through Women's Entrepreneurial Development? *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.776844

Bandura A (1993) Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist* 28(2): 117–148

Bilal, M. A., Khan, H. H., Irfan, M., Haq, S. M. N. U., Ali, M., Kakar, A., Ahmed, W., & Rauf, A. (2021). Influence of Financial Literacy and Educational Skills on Entrepreneurial Intent: Empirical Evidence from Young Entrepreneurs of Pakistan. *Journal of Asian Finance, Economics and Business*, *8*(1), 697–710. https://doi.org/10.13106/jafeb.2021.vol8.no1.697

Charles R. Chaffin EdD (2018) Self-Determination Theory and Self-Efficacy in Financial Planning, *Client Psychology*, Chapter 12. https://doi.org/10.1002/9781119440895.ch12

CYFI (2013) Research evidence on the CYFI model of children and youth as economic citizens. CSD Research Review No.13-04. Available at:

http://www.bu.edu/bucflp/files/2014/06/CYFI-Research-Brief-Research-Evidence-on-the-child-and-youth-finance-model-of-economic-citizenship-2.pdf

Dewi, V. I., Febrian, E., & Anwar, M. (2020). *Financial Literacy among the Millennial Generation: Relationships between Knowledge, Skills, Attitude, and Behavior*.

Frisancho, V. (2019). *The Impact of Financial Education for Youth*. http://www.iadb.org

Hastings JS, Madrian BC, Skimmyhorn WL (2013) Financial literacy, financial education, and economic outcomes. *Annual Review of Economics* 5(1): 347–373.

Hauff, J. C., Carlander, A., Gärling, T., & Nicolini, G. (2020). Retirement Financial Behaviour: How Important Is Being Financially Literate? *Journal of Consumer Policy*, *43*(3), 543–564. https://doi.org/10.1007/s10603-019-09444-x

Hilgert, M. A., Hogarth, J. M., & Beverly, S. G. (2003). Household financial management: The connection between knowledge and behavior. Federal Reserve Bulletin, 89, 309-322.

Khan, F., Siddiqui, M. A., & Imtiaz, S. (2022). Role of financial literacy in achieving financial inclusion: A review, synthesis and research agenda. In *Cogent Business and Management* (Vol. 9, Issue 1). Cogent OA. https://doi.org/10.1080/23311975.2022.2034236

Lusardi, A., & Mitchell, O. S. (2023). The Importance of Financial Literacy: Opening a New Field. *Journal of Economic Perspectives*, *37*(4), 137–154. https://doi.org/10.1257/jep.37.4.137

Lyons, A. C., & Kass-Hanna, J. (2021). A methodological overview to defining and measuring "digital" financial literacy. *Financial Planning Review*, *4*(2). https://doi.org/10.1002/cfp2.1113

Mandell, L., & Klein, L. S. (2009). *The Impact of Financial Literacy Education on Subsequent Financial Behavior*. http://ssrn.com/abstract=2224231

Morgan, P. J., & Long, T. Q. (2020). Financial literacy, financial inclusion, and savings behavior in Laos. *Journal of Asian Economics*, *68*. https://doi.org/10.1016/j.asieco.2020.101197

OECD. (2005). Improving financial literacy: Analysis of issues and policies. Paris: OECD

Organisation for Economic Co-operation and Development (OECD) (2014) PISA 2012 results: Students and money: *Financial literacy skills for the 21st century* (Vol. VI). In: PISA. Paris: OECD Publishing.

Ouachani, S., Belhassine, O., & Kammoun, A. (2021). Measuring financial literacy: a literature review. In *Managerial Finance* (Vol. 47, Issue 2, pp. 266–281). Emerald Group Holdings Ltd. https://doi.org/10.1108/MF-04-2019-0175

Rahman, M., Isa, C. R., Masud, M. M., Sarker, M., & Chowdhury, N. T. (2021). The role of financial behaviour, financial literacy, and financial stress in explaining the financial well-being of B40 group in Malaysia. *Future Business Journal*, *7*(1). https://doi.org/10.1186/s43093-021-00099-0

Solesvik, M. Z. (2019). Entrepreneurial Competencies and Intentions: the Role of Higher Education. *Forum Scientiae Oeconomia*, *7*(1), 23–36. https://doi.org/10.23762/fso

Tatad J. et al. (2024). The Effect of Financial Literacy and Budgeting Skills on Financial Wellbeing Among Finance Students of One of the Universities in Cagayan de Oro. 10.13140/RG.2.2.29853.93926.

Tehran A. M. K. et. al. (2025). The Impact of Financial Literacy on Financial Behavior and Financial Resilience with the Mediating Role of Financial Self-Efficacy. 7. 38-55. 10.22034/ijieor.v7i2.146.

Tohar, G., & Akron, S. (2025). Financial literacy cognitions and optimal financial behavior. *Finance Research Letters*, 83. https://doi.org/10.1016/j.frl.2025.107455

Van Campenhout G (2015) Revaluing the role of parents as financial socialization agents in youth financial literacy programs. *Journal of Consumer Affairs* 49(1): 186–222

Walstad WB, Rebeck K, MacDonald RA (2010) The effects of financial education on the financial knowledge of high school students. *Journal of Consumer Affairs* 44(2): 336–357.

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INTEGRATION OF SUSTAINABLE DEVELOPMENT IN INDIA'S SCHOOL EDUCATION CURRICULUM

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ABSTRACT
Integrating Sustainable Development concepts in the school educational modules is an important activity. This trains students on the problems related to the environment in the contemporary world. Various educational systems in India like the Central Board of Secondary Education (CBSE), the Indian Certificate of Secondary Education (ICSE) and different state syllabuses, sustainability education is taught through subjects like Environmental Science, Social Studies and the natural sciences. Students acquire the knowledge, skills and ethics necessary to contribute to positive change in society actively through interdisciplinary approaches, hands on learning experiences and value-based education. This paper features the significance of sustainability education in encouraging environmental awareness, social responsibility and ethical consciousness among students. This study attempts to examine how Sustainable Development practices and principles are dealt with in the school curriculum in Indian society. The investigator has adopted an analytical framework and comparative review method in examining the curriculum guidelines. The core objectives of the study are to understand, compare and find the gaps in integrating Sustainable Development education as a part of the Curriculum Frameworks in India. The investigator has studied the Curriculum Frameworks of CBSE, ICSE and selected state boards of India at different school levels and found that there is a considerable focus on awareness and social responsibility among the students. The findings also indicate that integration of sustainable development education across the boards is uneven.

Keywords: Integration, Sustainable Development, Curriculum, Environmental Awareness.

INTRODUCTION
Sustainable Development is important because of many interrelated factors in India (UNESCO, 2021). India faces many environmental challenges like pollution, deforestation, water scarcity and climate change (MoEF&CC, 2020). These issues affect health, livelihood conditions and wellbeing of people (World Health Organisation, 2018). Integrating Sustainable Development in the curriculum can help raise awareness about environmental conservation and responsibility for natural resources (United Nations Environment Programme, 2017). India is characterised by social inequalities and disparities in access to education, healthcare and basic amenities (United Nations Development Programme, 2019). Sustainable Development aims to address these inequalities by promoting inclusive growth, social justice and equal opportunities for all (World Bank, 2020). Schools encourage values like compassion, understanding and brotherhood by integrating the ideals of equity and social justice in the curriculum. This will

contribute to an equitable society (United Nations Children's Fund, 2021). Sustainable Development focuses on the need for balanced development which is eco-friendly and socially cohesive (UNDESA, 2015). In India, rapid industrialisation and urbanisation have raised issues like environmental degradation, resource depletion and social exclusion (NITI Aayog, 2018). The responsibility of preparing the future generations to participate and contribute to the sustainable economy also lies with the schools. By educating students about sustainable economic practices, utilising clean and renewable energy sources, adopting green technology and implementing regenerative economic practices the schools perform these responsibilities (Ministry of Education, 2020).

The identity and national pride of India is connected to the cultural diversity of the country (INTACH, 2020). Preservation and promotion of cultural heritage, traditional knowledge and indigenous practices are encouraged by Sustainable Development (UNESCO, 2019). Schools have to inculcate pride and respect for cultural diversity. Incorporating cultural outlook in the curriculum will help in this regard. This will encourage greater social cohesion and mutual understanding (NCERT, 2021). India, a rapidly globalising nation, is key in managing pressing worldwide concerns like climate change, biodiversity loss and social inequality (Ministry of External Affairs, 2021). Sustainable Development education can enable students to develop knowledge, skills and values that are required of a global citizen who is capable of understanding, analysing and handling complex global issues (UNESCO, 2016). Schools can empower students to participate in international efforts to achieve the Sustainable Development Goals (United Nations, 2020).

Sustainable practices are essential for holistic development. They address pressing environmental, social, economic and cultural challenges while promoting a vision of a just, inclusive and sustainable future for all (National Action Plan on Climate Change, 2008). Integrating Sustainable Development in the curriculum can help empower learners to understand and shape the challenges of an interrelated and complex world. (National Education Policy, 2020).

REVIEW OF LITERATURE

The existing scholarly work on the inclusion of Sustainable Development concepts in school-based learning examines how the pedagogic framework has evolved over a period of time at various levels of school education. The concept and interpretation of Sustainable Development are essential to understand its significance in the educational context. Accordingly, the review of literature has been done for the study on the themes: i) Sustainable Development: Definition and key principles, ii) Integrating Sustainable Development in the school curriculum: global practices, iii) Sustainable Development in the school educational curriculum in India. It will cover the scholarly works done on understanding Sustainable Development as a concept and its implementation in India.

Sustainable Development: Definition and Key Principles

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'Sustainable Development' is explained as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987). It features the importance of balancing economic, social and environmental dimensions. This ensures long term sustainability and wellbeing for both current and future generations. It recognises the interrelated nature of these systems stressing on the need for an integrated and holistic approach to decision making (WCED, 1987). It also promotes equity and social justice. This guarantees that every individual can access resources, opportunities and benefits irrespective of their socio-economic backgrounds (WCED, 1987). The main goal of sustainable development is to address the depletion of natural resources, air pollution and destruction to the habitat so that the biodiversity and ecosystems are protected (WCED, 1987).

Sustainable Development encourages formulation of policies and implementation of the initiatives by involving various stakeholders like local communities, business groups, government authorities and civil society organisations (UN, 2015). It adopts a careful approach to risk management. It recognises the ambiguities and potential implications of human activities on the environment and society (UN, 2015). Thus, Sustainable Development seeks to achieve economic development, social equality and environmental integrity (UNDP, 2015).

Sustainable Development is vital in protecting the environment. It helps to mitigate the negative impacts resulting from human activities on the planet. Embracing practices which would help in the reduction of pollution, conservation of natural resources and protection of ecosystems will be helpful (UN, 2019). It promotes responsible management of natural resources including water, energy and biodiversity for the present and future generations. Sustainable Development practices help in safeguarding these resources for the long-term use in agricultural, industrial and urban planning sectors (UNDP, 2019). It gives emphasis on the social equity so that all the sections of the people have access to basic facilities including education, health and livelihood opportunities. It also looks into the welfare of the present and future generations by focusing and managing socio economic inequalities as well as promoting social justice (World Bank, 2020).

Sustainable Development is an important tool in controlling the adverse effects of climate change. The climate related risks can be addressed by the reduction of greenhouse emissions, expansion of renewable energy consumption and climate adaptation approaches (Intergovernmental Panel on Climate Change, 2018). As the actions of the present generations have negatively impacted the environment, the responsibility of protecting the right of the future generations to live on a healthy planet also lies on the present generation where the students will play an important role. Sustainable development is thus vital for the present and future generations (WCED, 1987). Sustainable Development is vital for the present and future generations as it promotes environmental preservation, responsible resource management, social equity, climate change mitigation and intergenerational equity (UN, 2015).

Integration of Sustainable Development Principles in the School Curriculum: Global Practices

Education on Sustainable Development provides a holistic approach to curriculum (UNESCO, 2005). Through these curriculum schools offer students a clear understanding of the interrelated global issues and also train them to become responsible citizens (UN, 2017). Sustainable Development teachings acultivate critical thinking and problem-solving capacities to analyse complex socio environmental issues and develop innovative solutions (UNESCO, 2014). Students apply this knowledge to face sustainability challenges in their neighbourhood through inquiry based learning and projects (UNICEF, 2019). These teachings raise environmental awareness among students and encourage a sense of accountability for the natural world (UNEP, 2017). This will help the students to develop an appreciation for the environment and motivate them to protect it. They learn about ecological principles, biodiversity conservation and climate change mitigation (UNESCO, 2009). Sustainable Development education promotes values of social responsibility, equity and respect for diversity (UNESCO, 2015). Through discussions on human rights, sustainable consumption and global citizenship, students learn to respect cultural differences, advocate for social justice and participate actively in democratic processes (UN, 2016).

Sustainable Development teachings prepare students for future challenges and opportunities by empowering them with knowledge, skills and values to adapt and thrive. (UNESCO, 2019). By integrating topics such as green technology, renewable energy and sustainable business practices into the curriculum, schools empower students to contribute to Sustainable Development Goals and shape a more resilient and equitable future (UNDP, 2020). They are relevant in the school curriculum as they promote holistic education, critical thinking, environmental awareness, citizenship education and preparation for the future (UNESCO, 2021).

When we look into the Australian Curriculum has a cross curriculum priority area on sustainability, which is infused with subjects like science, geography and history. Students learn about environmental sustainability, social justice and economic prosperity through interdisciplinary projects and inquiry based learning (Australian Curriculum, n.d.). In Canada, provinces such as British Columbia have implemented sustainability focused Curriculum Frameworks that focuses environmental stewardship, social responsibility and economic viability. For example, the British Columbia Ministry of Education's Environmental Learning and Experience curriculum encourages hands on outdoor learning experiences and community based projects that promote sustainability (British Columbia Ministry of Education, n.d.). The national curriculum in Finland focuses interdisciplinary learning and holistic education, focusing on Sustainable Development. Through subjects such as environmental studies, social studies and technology, Finnish students learn about sustainability issues and build critical thinking and problem solving skills to tackle them. (Finnish National Agency for Education, n.d.). The Ministry of Education, Culture, Sports, Science and Technology (MEXT) in Japan promotes Education for Sustainable Development through the implementation of ESD guidelines and initiatives in schools. The curriculum integrates sustainability principles across subjects such as science, social studies and home economics, with a focus on environmental conservation, disaster preparedness and community engagement (MEXT, n.d.). Similarly, in

the United Kingdom, the National Curriculum for England includes a statutory requirement for schools to teach about sustainability and environmental issues across different subjects. For example, students learn about Sustainable Development in geography, biology and citizenship education, focusing on understanding the interrelatedness of social, economic and environmental structures. (Department for Education, n.d.). In the United States, several states have adopted environmental literacy standards and sustainability focused Curriculum Frameworks. For instance, the Next Generation Science Standards (NGSS) integrate sustainability practices into science education, focussing on topics like climate change, energy conservation and ecosystem dynamics (NGSS Lead States, 2013).

These examples demonstrate how countries around the world are integrating Sustainable Development into their academic programmes to meet the twenty first century demand and prospects. Each country's approach reflects its unique cultural, social and environmental context, but all share a common goal of promoting environmental stewardship, social responsibility and economic prosperity through education.

Sustainable Development in the school educational curriculum in India

The National Curriculum Framework, developed by the NCERT, provides guidelines for curriculum enhancement in India. The NCF focuses the integration of Sustainable Development across subjects and grade levels (NCERT, 2005). In the environmental science curriculum for primary grades, students learn about the importance of water conservation through activities such as measuring water usage at home and exploring methods to reduce water wastage (NCERT, 2018). Environmental Studies (EVS) is a compulsory subject in Indian schools, which aims to encourage environmental awareness and sustainability practices among students. The EVS curriculum covers topics such as biodiversity, conservation and waste management (CBSE, 2020). In EVS classes, students engage in tree plantation drives and waste segregation activities to understand the importance of biodiversity conservation and waste reduction (CBSE, 2020). The curriculum in Indian schools focuses on learning through projects and field trips to enhance students' understanding of Sustainable Development concepts (MOE, 2020). Students participate in eco clubs and nature walks to local parks or conservation areas, where they observe and learn about local ecosystems, biodiversity and the importance of environmental conservation (MOE, 2020). Sustainable Development concepts are integrated across various subjects, including science, social studies and languages, for a holistic understanding of environment, society and economic issues (NCERT, 2005). In social studies classes, students learn about sustainable agriculture practices and rural development initiatives, connecting concepts of Sustainable Development with local community development (NCERT, 2005). Schools in India encourage community engagement activities that promote Sustainable Development practices and civic responsibility among students (NCERT, 2013). Students participate in community clean-up drives, awareness campaigns on water conservation and initiatives to promote renewable energy adoption in their neighbourhoods, encouraging a sense of environmental stewardship and social responsibility (NCERT, 2013).

Sustainable Development is integrated into the curriculum of school education in India through the National Curriculum Framework, Environmental Studies, experiential learning approaches, integration across subjects and community engagement activities. These initiatives strive to prepare students with the essential competencies and ethics needed to address the challenges and support sustainability.

RESEARCH GAP

While there exists literature on global practices and the importance of Sustainable Development in school education, including India, there remains a significant gap in understanding how effectively the sustainable principles and development practices are integrated and operationalised in the school curriculum across different boards, i.e. CBSE, ICSE, State syllabi, etc. The existing studies also lack the comparative analysis of the sustainability related contents in the school modules across the board. This study attempts to fill this gap.

RATIONALE OF THE STUDY

Sustainable Development has become an essential component of the educational curriculum in contemporary times. As countries have recognised the complex environmental, socioeconomic and development challenges and are attempting to address these challenges, they are also train school children with knowledge, values and skills. Accordingly, the integration of Sustainable Development content in India's School curriculum through policy documents like the National Curriculum Framework, recommendations from the Ministry of Education, etc, has focussed the integration of Sustainable Development practices in the school education. However, as identified in the research gap, there is limited research on how the principles are embedded across the CBSE, ICSE and State boards. The study is therefore necessary to bridge the gap in analysing the Sustainable Development concept adopted by various boards and different educational levels, including the curriculum content, approaches and implementation practices. Understanding these dimensions is important for strengthening Sustainable Development principles in education and improving the curriculum to meet the Sustainable Development Goals prescribed by the United Nations.

RESEARCH OBJECTIVES

The core objectives of this paper are as follows:

- To examine the extent to which the Sustainable Development principles are included in the curriculum of CBSE, ICSE and state boards.
- To analyse the pedagogic approaches used to Sustainable Development content across subjects and levels.
- To compare Sustainable Development practices integrated across the different Curriculum Frameworks.

METHODOLOGY

The study has used a qualitative research design with a descriptive and comparative framework. This study depended upon the data collected from the NCERT, CBSE, ICSE and state boards Curriculum Frameworks. The secondary sources are gathered from USESCO, UNDP, NEP 2020, etc and have done a content analysis of the curriculum development policy frameworks. A thematic analysis has also been done on sustainability related topics across subjects at various levels. The documents are publicly available and no personal interviews are required.

THE SCOPE OF THE STUDY

The study has given focus to examining the integration of Sustainable Development principles in school curriculum among the major educational boards, i.e. CBSE, ICSE and selected state boards, including Maharashtra, Karnataka, Kerala, Tamil Nadu and Telangana. It analyses Curriculum Frameworks and pedagogy at various levels. The study is limited to documentary and comparative analysis. Though the global examples of curriculum for Sustainable Development are provided to understand the diverse context, the core scope of the study is confined to the Indian school curriculum only.

DISCUSSIONS

Sustainable Development education is incorporated without moving the essence, differently across CBSE, ICSE and State boards in India, reflecting varied curriculum structures. The different boards have adopted their specific approaches to deal with sustainability issues. The following discussions have outlined the various school boards and various levels to provide a comprehensive picture of how Sustainable Development is dealt with in the school curriculum.

Sustainable Development concept in the CBSE curriculum

Sustainable Development principles are integrated into the curriculum of the CBSE board in India. This board mandates Environmental Studies (EVS) as a compulsory subject in primary and middle school. The EVS curriculum covers topics such as biodiversity, conservation practices, climate change concerns and sustainability (CBSE, 2020). In these classes, students study about the concept of Sustainable Development. They read about cases of eco-friendly practices in agriculture, energy and waste management. They are taught the value of a stable environment and its social and economic effects for long term wellbeing (CBSE, 2020).

As the CBSE board encourages interdisciplinary approach to education, Sustainable Development concepts are integrated across different subjects like science, social studies and languages (CBSE, 2014). In science classes, students learn about renewable energy sources like solar, wind and hydro power in mitigating the climate changes. They also study the principles behind renewable energy technologies and discuss their environmental benefits of such technologies and how it is better than the use of fossil fuels (CBSE, 2014). Project Based Learning (PBL) as a pedagogical strategy is used by the CBSE board. It engages students in real world sustainability activities. As a teaching pedagogy PBL encourages students to investigate sustainability issues, propose solutions and implement action plans (CBSE, 2020). Students undertake PBL initiatives such as designing rainwater harvesting systems for their

schools, conducting energy audits to identify energy saving opportunities and organising awareness campaigns on causes of pollution in their communities (CBSE, 2020). CBSE education encourage the development of ethical values, social responsibility and environmental leadership among students. Sustainable Development principles are incorporated into the curriculum to promote affinity, cooperation and respect to nature, (CBSE, 2020). Students participate in tree plantation drives, cleanliness campaigns and community service projects aimed at promoting sustainable living practices and social inclusivity (CBSE, 2020).

The contents of the syllabus related to Sustainable Development in the CBSE curriculum is identified across various levels and classes. EVS is introduced as a compulsory subject at the primary level which covers classes from 1 to 5. The subject covers basic concepts related to environment including awareness about it, conservation of nature and the essence of sustainability. Students are required to learn about topics like plants, animals, water, air and the importance of protecting the environment. EVS continues to be a compulsory subject at the middle level i.e. from classes 6 to 8. In this level, more advanced topics related to environmental science, Sustainable Development and human environment interactions are being taught to the students. They explore issues like pollution, management of natural resources, climate change and conservation of biodiversity. However, at the secondary level, i.e., from classes 9 to 10, environmental concepts are taught through science subjects like Biology, Physics and Chemistry. Interdisciplinary approaches are introduced where students are made to analyse environmental issues from scientific, social and economic perspectives. Social Sciences, English and Mathematics also reflects topics related to environmental sustainability. At the senior secondary level (Classes 11 to 12), Environmental Science becomes an elective subject. In this level the curriculum delves into topics like environmental management, Sustainable Development strategies, environmental policies and conservation biology. Students are given the opportunity to do fieldwork, research projects and practical activities in their area of choice.

Thus, the syllabus contents related to Sustainable Development are gradually integrated into the curriculum across different levels and classes in the CBSE system. Beginning from the primary sections and continuing through secondary and senior secondary levels the curriculum trains students in dealing the various issues related to the Sustainable Development. This approach ensures that students receive a comprehensive education on environmental awareness, conservation and sustainability as they progress through their academic journey.

Sustainable Development concept in the ICSE curriculum

The ICSE curriculum has also integrated Sustainable Development topics in its educational framework. Environmental Science as a compulsory subject covers topics related to environmental awareness, conservation and sustainability (CISCE, n.d.). In the classes related to environmental science, students learn about ecosystem, biodiversity conservation and the effects of human activities on the nature. They also explore various case studies related to Sustainable Development initiatives and participate in environment related projects to find solutions local environmental issues (CISCE, n.d.). Like the CBSE board, the ICSE board also

adopts an interdisciplinary approach. This approach is visible in the integration of Sustainable Development concepts in different subjects like science, social studies and languages (CISCE, n.d.). Students study about renewable energy sources, climate change and mitigation strategies. In science classes they conduct experiments to explore the concepts like solar energy conversion and investigate the effect of different energy sources on the environment. Social and economic dimensions of sustainability, including Sustainable Development goals and environmental policies are studied in social studies classes (CISCE, n.d.). Field trips and projects that provide hands on learning experiences related to Sustainable Development are part and parcel of ICSE school curriculum. These activities are undertaken with an intension to allow the learners to engage with real world environmental issues and develop practical solutions (CISCE, n.d.). Students also visit local ecosystems such as forests or wetlands to know about the prevailing biodiversity and the ecological processes. Schools having access to rivers and lakes are also given the opportunity to conduct water quality assessment to have an in depth understanding of water pollution and to explore conservation methods (CISCE, n.d.). Participation in community service projects, environmental awareness drives and campaigns is encouraged by the ICSE curriculum. These activities are promoted to develop a sense of environmental responsibility and civic engagement among students (CISCE, n.d.).

Hence, one can observe that the ICSE board curriculum in India incorporates Sustainable Development principles through various means. Sustainable development principles transacted through subjects like environmental science, sciences, social sciences and also through different activities like field trips, projects and community based education initiatives. All these efforts are undertaken with the sole aim to train students to become capable to address environmental and social challenges and to build a sustainable future.

On close perusal of the ICSE board curriculum, teaching of Sustainable Development principles are segregated as per stages and class levels. At the primary level, from classes 1to 5, basic concepts related to environmental awareness and sustainability are taught through subjects like Environmental Studies or General Science. They read about basic ecological principles, conservation practices and the importance of protecting the environment. In classes 6 to 8, environmental science becomes a more structured subject at the middle level, where students are exposed to topics like biodiversity, pollution and climate change. We can see the implementation of interdisciplinary approaches as environmental concepts are also taught through subjects like Science, Social Studies and Geography. Environmental Science continues to be a compulsory subject with a focus on more advanced topics and practical applications at the secondary level (classes 9 to 10). Sustainability issues in greater depth, resource management, Sustainable Development strategies and environmental policies are taught to the students at this level. Once the students enter the Senior Secondary Level (Classes from 11 to 12), Environmental Science is offered as an elective subject. They are given the freedom to specialise in their areas of interest and can cover broad areas like ecology, conservation biology, or environmental management. At this level the curriculum may include fieldwork, research projects and internships to provide experiences in Sustainable Development practices.

Apart from environmental science, subjects like science, social science, geography and economics also cover contents on Sustainable Development. Hence, it can be said that ICSE board curriculum emphasises a holistic approach to sustainable education.

Sustainable Development concept in the state level curriculum

Most of the states in India have its own educational board that caters to the curriculum of schools within its jurisdiction. It is observed that many state syllabuses include Environmental Science as a compulsory subject at various levels of education. This subject covers topics like environmental awareness, conservation and Sustainable Development (Government of India, 2005). The Maharashtra State Board schools include Environmental Studies as a compulsory subject from primary to secondary levels. Topics such as natural resources, pollution and conservation methods are taught to the students (Government of Maharashtra, n.d.). State syllabuses usually adopt an interdisciplinary approach to learning. This is done by integrating Sustainable Development concepts across different subjects such as Science, Social Studies and Languages (Government of India, 2005). In Karnataka State Board schools, Sustainable Development principles are merged into subjects like Science, Geography and Economics. Students learn about environmental issues, sustainable agriculture practices and the importance of biodiversity conservation (Government of Karnataka, n.d.). There are other state board syllabuses which focus on problem-based learning approaches that enable students to explore sustainability issues and propose solutions (Government of India, 2005). The students studying under the Tamil Nadu State Boards undertake projects on topics like water conservation, renewable energy and waste management. They conduct research, collect data and present their findings to raise awareness and promote sustainable practices in their communities (Government of Tamil Nadu, n.d.).

State syllabuses suggest for incorporating field trips and practical activities in order to provide hands on learning experiences (Government of India, 2005). In Kerala State Board schools, students take part in field trips to ecological reserves, organic farms and renewable energy installations. They are also engaged in activities like tree planting, soil testing and preparing compost. These activities help them to learn about environmental conservation and sustainable living practices (Government of Kerala, n.d.). State syllabuses often promote education that develop ethical values, social responsibility and environmental stewardship among students (Government of India, 2005). In Telangana State Board schools, value based education initiatives focus on instilling values such as empathy, cooperation and respect for nature. Students are motivated to participate in community oriented service projects and environmental awareness campaigns (Government of Telangana, n.d.).

Different states have varying approaches to teach Sustainable Development principles in the curriculum. At the primary level (classes 1 to 5), foundational concepts related to environmental awareness and sustainability are generally introduced through Environmental Studies or General Science. Through these subjects' students learn about basic ecological principles, conservation practices and also become aware of the need to preserve the environment. In other states, Environmental Science or Environmental Studies becomes a

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separate subject at the middle level, i.e., classes 6 to 8. Students acquire knowledge on topics like biodiversity, pollution, climate change and Sustainable Development. Interdisciplinary approaches may be employed to integrate environmental concepts into subjects like Science, Social Studies and Geography. Environmental Science continues to be a compulsory subject at the secondary level, from class 9 to 10, in some states. The curriculum focuses on more advanced topics and practical applications of Sustainable Development principles, including resource management, Sustainable Development strategies and environmental policies. Some states offer Environmental Science or related subjects as elective courses at the senior secondary level. Students may have the opportunity to specialise in areas such as ecology, conservation biology, environmental management, or Sustainable Development. Practical activities, fieldwork and projects may be included to provide hands on experience in Sustainable Development practices. The summary of findings has been put forward in the following table.

Table 1: Sustainable Development Integration in CBSE, ICSE and State Boards

Level	CBSE	ICSE	STATE BOARDS
Primary (Classes 1–5)	EVS compulsory; focus on basic environmental awareness, water, air, plants, animals and conservation.	EVS/General Science includes foundational ecology, conservation and environmental hygiene.	EVS or Environmental Studies in most states; focus on local ecology, basic conservation and natural resources.
Middle (Classes 6–8)	EVS continues: advanced topics like pollution, biodiversity, climate change; interdisciplinary integration.	Structured Environmental Science with a deeper focus on pollution, biodiversity, SD concepts; interdisciplinary links with Geography/Science.	Environmental Science has been introduced or expanded in many states; topics include climate change, ecosystems and sustainable agriculture.
Secondary (Classes 9–10)	Sustainability concepts integrated into Science (Biology/Physics/Chemistry) and Social Science; SD themes linked to socio economic issues	Environmental Science compulsory; strong focuses on practical learning, experiments and environmental impacts.	Varies by state—some include Environmental Science as a compulsory subject; others integrate SD into Science, Social Science and Geography.

Senior Secondary (Classes 11–12)	Environmental Science offered as an elective; covers SD strategies, environmental laws, management, conservation biology; fieldwork encouraged.	Environmental Science elective; advanced study of ecology, resource management, environmental policy, field trips and research projects	Some states offer Environmental Science or related electives (e.g., ecology, agriculture, environmental management); implementation varies significantly.

Overall, Sustainable Development is integrated into the curriculum of state syllabuses in India through subjects like Environmental Science, interdisciplinary approaches, project based learning, field trips, practical activities and value based education initiatives.

Implications of the study

The study has identified that there is a stronger and consistent integration of Sustainable Development principles across all school boards of the country. It also features the requirement of experimental, practical based learning to improve students' understanding of Sustainable Development issues. The study also suggests that Sustainable Development education is essential for building social responsibility among students from their early stages of learning, for which there is a need for interdisciplinary teaching, linking environmental, political and socioeconomic dimensions of Sustainable Development teachings. The report also presses upon the need for incorporating Sustainable Development education as part of the teacher training programmes so that the same can be transmitted to students in the classroom environment. This study also underscores the need for the integration and adoption of best practices from international experiences in teaching learning activities in the Indian education system. The study argues that Sustainable Development education can be helpful in developing lifelong eco friendly behaviour and responsibility among students so that environmental consciousness can be built and social responsibility can be inculcated among the future citizens of India.

Conclusion

The CBSE, ICSE and state syllabuses show a systematic effort to prepare the students for the challenges and opportunities of the 21st century. Educators seek to nurture environmentally aware learners, socially responsible, ethically conscious individuals capable of contributing to a sustainable future.

Sustainable Development concepts in Environmental Science, Social Studies, Science and Geography underscores the interdisciplinary nature of Education for Sustainable Development. Various pedagogies like experiential learning, project work and community engagement enables the students to connect theory and its practical implications.

It is observed that focus is given to value-based education. Promotion of ethical values, environmental awareness and civic responsibility among students are given more weightage.

The teachers aimed to develop values such as empathy, cooperation, respect for nature, environmental consciousness and social commitment in the younger generation.

Although, many variations were detected in the implementation of sustainable development education across different educational systems and states, the overall goal seems to be consistent. All educational boards wanted to prepare students with the essential competencies and values required to become active agents of change at the local level and beyond. Educators focused on training students with a strong foundation in Sustainable Development principles. They aimed to inspire an everlasting commitment to environmental conservation, social equity and economic prosperity through education. Sustainable Development Education in Indian schools shows aspiration to deliver academic knowledge and cultivate a deeper understanding of how environmental, social and economic systems work. The educational system strives to make the students responsible and act as an agency to create a better world for present and future generations.

References

Australian Curriculum. (n.d.). (2025). Sustainability. Retrieved from https://www.australiancurriculum.edu.au/f 10 curriculum/cross curriculum

British Columbia Ministry of Education. (n.d.). (2025). Environmental Learning and Experience (ELE). Retrieved from https://www2.gov.bc.ca/gov/content/education training/k 12/teach/teaching tools/environmental learning and experience ele.

Central Board of Secondary Education (CBSE). (2014). Curriculum for Secondary Classes. Retrieved from http://cbseacademic.nic.in/web_material/CurriculumMain20/SeniorSecondary/SECCurriculum/SeniorSecondaryCurriculum_Volume_1.pdf.

Central Board of Secondary Education (CBSE). (2020). Environmental Studies Curriculum. Retrieved from http://cbseacademic.nic.in/web_material/CurriculumMain21/2020_21_EVS_XII.pdf.

Council for the Indian School Certificate Examinations (CISCE). (n.d.). (2025). Curriculum. Retrieved from https://www.cisce.org/curriculum/.

Department for Education. (n.d.). National Curriculum in England: Geography. Retrieved from https://www.gov.uk/government/publications/national curriculum in england geography programmes of study.

Finnish National Agency for Education. (n.d.). Curriculum Development in Finland. Retrieved from https://www.oph.fi/en/education and competence/curriculum.

Government of India. (2005). National Curriculum Framework. Retrieved from http://ncert.nic.in/rightside/links/pdf/framework/english/nf2005.pdf.

Government of Karnataka. (n.d.). (2025). Karnataka State Board Curriculum. Retrieved from http://kseeb.kar.nic.in/.

Government of Kerala. (n.d.). (2025). Kerala State Board Curriculum. Retrieved from https://samagra.kite.kerala.gov.in/.

Government of Maharashtra. (n.d.). (2025). Maharashtra State Board Curriculum. Retrieved from https://mahahsscboard.in/.

Government of Tamil Nadu. (n.d.). (2025). Tamil Nadu State Board Curriculum. Retrieved from http://www.textbooksonline.tn.nic.in/.

Government of Telangana. (n.d.). (2025). Telangana State Board Curriculum. Retrieved from https://www.scert.telangana.gov.in/.

Indian National Trust for Art and Cultural Heritage (INTACH). (2020). Heritage Education and Awareness Programme. Retrieved from https://www.intach.org/heritage education/.

Intergovernmental Panel on Climate Change (IPCC). (2018). Global Warming of 1.5°C. Retrieved from https://www.ipcc.ch/sr15/.

Ministry of Education (MOE). (2020). National Education Policy 2020. Retrieved from https://www.education.gov.in/en/nep new.

Ministry of Education, Culture, Sports, Science and Technology (MEXT). (n.d.). (2025). Education for Sustainable Development. Retrieved from http://www.mext.go.jp/en/policy/education/elsec/1305564.htm.

Ministry of Education. (2020). Education for Sustainable Development. Retrieved from https://www.mhrd.gov.in/esd.

Ministry of Environment, Forest and Climate Change (MoEFCC). (2020). State of Environment Report India 2019. Retrieved from http://www.moef.gov.in/sites/default/files/SoER_India_2019.pdf.

Ministry of External Affairs. (2021). India and the United Nations. Retrieved from https://www.mea.gov.in/india and united nations.htm.

National Action Plan on Climate Change (NAPCC). (2008). Prime Minister's Council on Climate Change. Retrieved from http://www.nicra icar.in/nicrarevised/images/pdf/National_Action_Plan_on_Climate_Change.pdf.

National Council of Educational Research and Training (NCERT). (2021). Education for Sustainable Development. Retrieved from https://ncert.nic.in/ncerts/textbook/textbook.htm.

National Council of Educational Research and Training (NCERT). (2005). National Curriculum Framework. Retrieved from https://www.ncert.nic.in/pdf/framework/english/nf2005.pdf.

National Council of Educational Research and Training (NCERT). (2013). Position Paper on Environmental Education. Retrieved from https://www.ncert.nic.in/pdf/publication/position_papers/Position_Paper_on_Environmental_Education_2020.pdf.

National Council of Educational Research and Training (NCERT). (2018). Environmental Studies Curriculum. Retrieved from https://www.ncert.nic.in/pdf/iees/english/evs/v_3/Ch_6.pdf.

NGSS Lead States. (2013). Next Generation Science Standards. Retrieved from https://www.nextgenscience.org/.

NITI Aayog. (2018). Composite Water Management Index: A Tool for Water Management. Retrieved from https://niti.gov.in/planningcommission.gov.in/docs/workingpapers/water_index.pd.

UNESCO. (2021). Education for Sustainable Development. Retrieved from https://en.unesco.org/themes/education Sustainable Development.

United Nations Children's Fund (UNICEF). (2019). Education for Sustainable Development: Learning objectives. Retrieved from https://www.unicef.org/education/education Sustainable Development learning objectives.

United Nations Department of Economic and Social Affairs (UN DESA). (2015). Sustainable Development Goals. Retrieved from https://sdgs.un.org/goals.

United Nations Development Programme (UNDP). (2019). Sustainable Development Goals. Retrieved from https://www.undp.org/Sustainable Development goals.

United Nations Development Programme (UNDP). (2020). Sustainable Development Goals. Retrieved from https://www.undp.org/Sustainable Development goals.

United Nations Educational, Scientific and Cultural Organisation (UNESCO). (2016). Global Citizenship Education: Topics and Learning Objectives. Retrieved from https://en.unesco.org/themes/education Sustainable Development/gced/learning objectives.

United Nations Educational, Scientific and Cultural Organisation (UNESCO). (2005). Education for Sustainable Development: A roadmap. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000142062.

United Nations Educational, Scientific and Cultural Organisation (UNESCO). (2014). Shaping the Future We Want: UN Decade of Education for Sustainable Development (2005 2014) Final Report. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000228054.

United Nations Educational, Scientific and Cultural Organisation (UNESCO). (2009). Education for Sustainable Development: Sourcebook. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000175318.

United Nations Educational, Scientific and Cultural Organisation (UNESCO). (2015). Global Citizenship Education: Preparing learners for the challenges of the 21st century. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000246327.

United Nations Educational, Scientific and Cultural Organisation (UNESCO). (2021). Education for Sustainable Development. Retrieved from https://en.unesco.org/themes/education Sustainable Development.

United Nations Environment Programme (UNEP). (2017). Education for Sustainable Development: Learning Objectives. Retrieved from https://www.unenvironment.org/resources/publication/education Sustainable Development learning objectives.

United Nations. (2015). Sustainable Development Goals. Retrieved from https://sdgs.un.org/goals.

United Nations Development Programme (UNDP). (2015). Sustainable Development Goals. Retrieved from https://www.undp.org/Sustainable Development goals.

United Nations. (2016). Global Citizenship Education: Preparing learners for the challenges of the 21st century. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000246327.

United Nations. (2020). Sustainable Development Goals. Retrieved from https://www.un.org/sustainabledevelopment/Sustainable Development goals/.

World Bank. (2020). Inclusive Growth. Retrieved from https://www.worldbank.org/en/topic/inclusive growth.

World Commission on Environment and Development (WCED). (1987). Our Common Future. Oxford University Press.

World Health Organisation (WHO). (2018). Climate change and health. Retrieved from https://www.who.int/news room/fact sheets/detail/climate change and health.

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INSTITUTE INNOVATION PLATFORMS (IIPS) AND THEIR ROLE IN ENHANCING EDUCATIONAL OUTPUTS IN WEST BENGAL

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ABSTRACT

As the educational landscape evolves, fostering student innovation has become central to preparing learners for the demands of a rapidly changing global workforce. The insight to innovative thinking is produced from childhood. The best place to inculcate this phenomenon is obviously the educational institutes where the students spends most of the time of the day under the proper guidance of faculties for the interested field. Government-recognized Higher Education Institutions (HEIs) are steadily moving away from traditional models, positioning students as active knowledge creators rather than passive recipients. Experiential Learning is call of the hour. Hence Industry-Institute-Interface (3Is) foster major practical based knowledge source. The Institute Innovation Council (IIP) along with Institute Innovation Platforms (IIPs) play a major role in implementation of the entrepreneurial and 21st-century skill development and Student-led innovation, for encouraging entrepreneurship. This research examines the role of institutional platforms in fostering student-led innovation, increasing engagement, and transforming teaching methodologies. To promote this, both the Central and State Governments have put distinct plans into action. This includes paying for incubation centres, which are places where fresh ideas are developed and turned into something that may be used in an organisation.

Keywords: Entrepreneurship, Experiential learning, Higher Education Institutes, Institutional platforms, Student-led innovation

INTRODUCTION

Innovation platforms like incubators, maker spaces, hackathons, transdisciplinary laboratories, and innovation councils help students learn by letting them apply what they've learnt to real-

world problems. These settings help students develop important 21st-century abilities including working together, thinking critically, being flexible, and solving problems. They also speed up the change from teaching by lecture to teaching by student-centered learning. These platforms encourage students to launch their own companies, conduct applied research, and create prototypes that address pressing social and economic concerns in addition to offering tools, structured mentoring, and links to the corporate world. By ensuring that children from all backgrounds have equal opportunities to express themselves, experiment with various subjects, and learn from one another, they help promote diversity. Feedback loops and iterative design cycles encourage students to reflect on their work and consider ways to improve it. This equips them to handle complexity and unpredictability. By establishing universities as hubs of innovation, increasing placement rates, securing funding, and fostering collaborations with industry and policy organizations, these platforms help them become more prominent. Faculty members make connections between academic knowledge and practical applications when they use these platforms. However, long-term strategic planning, curricular integration, equitable access, and continuous funding for staff and faculty training are all need to make it successful. If these conditions are satisfied, innovation platforms have the potential to transform the game by increasing access to opportunities, enhancing academic performance, and transforming higher education institutions (HEIs) into catalysts for the creation of knowledge and societal progress.

In order to promote innovation, entrepreneurship, and the integration of new technologies with traditional teaching and research, Institute Innovation Platforms (IIPs) offer structured institutional frameworks integrated into educational ecosystems. These platforms offer an organized way to promote a creative and problem-solving culture, which instantly raises the caliber of learning, teaching, and research outcomes. In India, national initiatives like the Institution's Innovation Council (IIC), which was designed and carried out by the Ministry of Education's Innovation Cell, frequently help IIPs operate. Also, the rise of digital educational technologies, incubation centres, and collaborative research hubs has greatly increased the range and usefulness of these platforms in helping schools meet the needs of today's students and society, such as working together, thinking critically, being flexible, and solving problems. This has also sped up the shift from lecture-based teaching to student-centered learning.

In West Bengal, IIPs play a very important role in solving educational and developmental problems that are unique to that area. Some of issues include the ongoing digital divide that makes it hard for everyone to access to learning materials, the big learning gaps that pupils have after the epidemic, and the growing need for skill-based education. The latter coincides with the aim of the National Education Policy (NEP) 2020 (Rahman & Mehnaz, 2024), which promotes competency-based learning, transdisciplinary interaction, and the enhancement of employable skills. In West Bengal, IIPs serve as strategic instruments to strengthen institutional and socioeconomic ties by promoting collaboration between government agencies, corporations, and academic institutions.

This research examines how IIPs have improved educational results in West Bengal by combining scholarly literature, government policy papers, and reports from each state. The analysis highlights their impact on increasing student engagement, encouraging innovative teaching, improving job prospects, and increasing research productivity. It also highlights significant issues such disparities in resources between institutions, faculty members' lack of exposure to innovation ecosystems, and infrastructural issues. The evaluation ends by emphasising the future potential of IIPs as powerful tools for making education in West Bengal more open and focused on innovation. This state has a lot of distinct people, places, and cultures, thus it has various demands when it comes to education. This might create a big gap between what the industry needs and what people have learnt. This analysis is based on a review of the literature to find out how these programs are helping to address the gap.

RESEARCH OBJECTIVE

The researchers of this paper dealt with the possibility to understand the efficacy of new policies set up by the Government, both Central and State, on creating industry readiness of the graduating students. The aim of the study is also to understand whether this approach will help bridge the Industry-Academia gap and also create skill enhancement amongst the students both from academic or vocational perspective.

RESEARCH METHODOLOGY

This paper is based on a qualitative approach towards the role played by IIP, IIC on HEIs. To study the same the researches have done a thorough Literature Review and comparative analysis of the skill growth of different HEIs after implementation of Govt. Schemes through IICs of the respective institutes. The Research is conducted with secondary data from 2015 till 2025, which encompasses the NEP 2020. It also marked the surge in online and ICT based education during COVID – 19.

Role of IIPs in Fostering Innovation and Entrepreneurship

Though named NEP 2020, the policy was drafted between 2017–2019. IIPs, particularly through the IIC framework, have been pivotal in cultivating an innovation ecosystem in Indian higher education institutions (HEIs). Based on the draft policy, the IIC program was launched which encourages activities such as mentorship, startup incubation, and intellectual property rights awareness, impacting over 1.5 million students nationwide by 2019–20 (*Annual_19_eng*, n.d.)

In West Bengal, institutions like Berhampore Girls' College have leveraged IIC to foster dynamic startup environments, promoting collaborative research and skill development among students (*3_2_1_rdc1*, n.d.). In a similar vein, the Om Dayal Group of Institutions organized events like Voyage 2025 under the IIC's auspices in collaboration with the Internal Quality Assurance Cell (IQAC), emphasizing innovation and experiential learning to satisfy social demands (Voyage-2025[1], n.d.).

IIPs improve employability and advance socioeconomic development by fostering industry-academia relationships that enhance educational results. For example, partnerships with NPTEL, Swayam, and IBM's Innovation Center for Education have increased R&D activities in engineering schools, leading to an increase in interdisciplinary projects and patent applications (Industry-Academic-Collaborations-Key-Innovation-Progress-Sharma[1], n.d.). These partnerships are crucial for state public universities (SPUs) in Bengal; West Bengal is ranked second in the country with 38 SPUs, providing over 1,500 affiliated institutions with access to higher education (Shah et al., n.d.). This is made possible by the All India Council for Technical Education (AICTE) through programs like IEM-UEM ("Grant-in-Aid Received from AICTE to Carry out Graphene-Based Research under Research Promotion Scheme (RPS)," 2022) and the Atal Ranking of Institutions on Innovation Achievements (ARIIA). These programs enhance student engagement in hackathons and internships by offering scholarships of up to Rs 25 lakh for research and development activities (PMC9449486[1], n.d.).

The India Innovation Index emphasizes technology as a way to address problems like poverty and underscores the important role that higher education institutions play in generating international scientific papers and obtaining funds under NEP 2020. This is best demonstrated in Bengal by IIM Calcutta, which has been a leader in management education and international partnerships since 1961, improving research quality and worldwide rankings (Expanding-Quality-Higher-Education-through-SPUs[1], n.d.).

Sustainable and Inclusive Innovation: The potential of IIPs to support gender-sensitive and sustainable innovation ecosystems is an understudied aspect. Two women's colleges, Lady Brabourne College and Bethune College (Bethune College: Collaborations, n.d.), have established entrepreneurial cells for female-led businesses in social innovation, healthcare, and handicrafts. Similarly, universities like Jadavpur University have led the way in green technology research, including solar energy and renewable resources ("School Of Energy Studies," n.d.), ("School Of Illumination Science, Engineering and Design," n.d.). We ensure that innovation directly addresses social and environmental challenges and closes the gender gap in STEM professions by including sustainability and inclusion into IIPs.

Governmental Support to the Institutes to set up IIPs

The Ministry of Micro, Small, and Medium Enterprises (MSME) is a major sponsor of Institution Innovation Councils (IICs) at colleges and universities throughout India. These councils assist make the environment more conducive to entrepreneurship and innovation (Inc[1], n.d.). MSME provides educators, students, and aspiring business owners with the instruments, materials, and regulations they require to turn their ideas into reality.

Through organizations like the National Small Industries Corporation (NSIC) and the National Institute for Micro, Small, and Medium Enterprises (NIMSME), MSME provides programs that assist individuals in learning new skills, improving their technology, and receiving business guidance. These resources can be used by higher education institutions with IICs to

acquire improved training facilities, incubation centers, and equipment for testing products or materials.

MSME's initiatives, which include financial assistance, marketing support, and incubation training, give researchers and students the resources they need to turn their creative ideas into successful businesses. Hackathons, concept competitions, and seminars sponsored by MSME bring students together with professionals in the field so they may work on actual problems that small and medium-sized businesses confront. They also help people get seed money and mentors via company development networks.

MSME (Home[1], n.d.) supports IICs fit with the National Education Policy's goal on encouraging innovation and practical skills by sponsoring programs that assist people learn new skills and camps for young entrepreneurs. MSME Idea Hackathons and other regular events highlight how this partnership works by allowing students and professors a chance to come up with and test their ideas in the actual world.

Digital Integration and E-Learning through IIPs

Digital IIPs, such EdTech platforms and e-learning tools, have changed the way education is delivered in West Bengal, especially after the pandemic. The Banglar Shiksha Portal (L9UP5WAR, n.d.) has over 300 audio and video resources and 30.3 million views on YouTube. It makes learning easier and helps close the divide between rural and urban areas [8]. Banglar Shiksha Online Classroom and Paray Sikshalaya (doorstep schools) were two programs that helped keep things going amid interruptions. Bridge courses let students who had missed classes I–XII catch up (Edtech-Solutions-for-Educational-Institutions-in-West-Bengal[1], n.d.).

In a private school in Bardhhaman, for example, school management software has cut down on administrative work by 30%. In a Kolkata government college, digital classrooms have made students more interested in their studies and improved their exam scores (Edtech-Solutions-for-Educational-Institutions-in-West-Bengal[1], n.d.). These platforms enable seamless contact between parents and instructors, personalized learning, and the use of data to identify knowledge gaps, all of which enhance academic success.

Increased integration of digital education promotes collaboration through social media platforms like Facebook and WhatsApp. This provides students with a range of learning opportunities and aids in the development of instructors [10]. These efforts are aided by national platforms such as DIKSHA (Diksha[1], n.d.) and NISHTHA (Nishtha-Scheme[1], n.d.). However, West Bengal's lack of participation in NISHTHA 2.0/3.0 indicates that implementation gaps remain (Edtech-Solutions-for-Educational-Institutions-in-West-Bengal[1], n.d.). Cloud computing and Massive Open Online Courses (MOOCs) (Jarial et al., 2025) greatly improve educational results by providing scalable, high-quality education without geographical restrictions (Datta & Mete, 2024). Table 1 shows a comparison study.

Emerging technologies such as artificial intelligence (AI), blockchain, and Internet of Things (IoT) are expected to further enhance IIPs by enabling predictive analytics in learning, decentralized credentialing systems, and smart campus ecosystems. While IIT Kharagpur has advanced in this domain through AI collaborations with TCS and IBM, state public universities lag in adoption. Establishing state-level AI innovation clusters could democratize access to these emerging technologies across institutions.

Learning Aid	Targets (till June 2025)	Achievement (as on 30 June 2025)
Banglar Shiksha Portal	Real-time digital records for 95K schools; 100% GER at Secondary level by 2030; 100% literacy/numeracy (Class 3) by 2025.	Portal actively used by schools; ~95K schools on boarded; supports tracking & assessment
Banglar Shiksha Online Classroom	Ensure online access for max enrolled students in WB public schools; Provide e-content/pedagogy	Wide adoption during COVID-19 and post-pandemic; supports online classes/resources
Paray Sikshalaya	Community-based learning for out-of-school children post-pandemic; Target maximum reach in underserved areas	Significant community educator engagement; localized learning hubs set up across districts
DIKSHA	National digital infrastructure for students/teachers; scale for all grades/subjects	E-content enabled for K-12; utilized by WB teachers and students for resources/quizzes
NISHTHA (Teacher Training Program)	Train ~42 lakh teachers, heads etc. nationally; Inclusive & ICT pedagogy targets	Over 35+ lakh school teachers/principals trained pan-India; WB-wide implementation

Table 1: Comparative study of target and achievement of different learning aids till June 2025

Average Programs and Events Held under the Institution's Innovation Council (IIC) in Educational Institutes in West Bengal

The Institution's Innovation Council (IIC), established by the Ministry of Education's Innovation Cell (MIC) in collaboration with the All India Council for Technical Education (AICTE), promotes innovation, entrepreneurship, and intellectual property rights (IPR) awareness in higher educational institutions (HEIs). In West Bengal, part of the Eastern Region (ERO) under IIC's zonal division, over 1,000 HEIs, including universities and colleges affiliated with MAKAUT and Jadavpur University (*WELCOME TO INNOVATION AND STARTUP*, n.d.) , are registered under IIC as of 2024–25 (*AR_2023-24_en*, n.d.)

IIC mandates a minimum of 12 activities per academic year (3 per quarter across 4 quarters) from its prescribed calendar to achieve full quarterly scores and star ratings (*MoE Innovation Cell*, n.d.) .This standard applies uniformly across India, including West Bengal, to ensure a robust innovation ecosystem. Institutes are incentivized to exceed this minimum through funding opportunities like the Atal Ranking of Institutions on Innovation Achievements (ARIIA), offering grants up to Rs. 25 lakh (*Government of India, All India Council for Technical Education* |, 2025)

On average, compliant West Bengal institutes conduct 12–20 activities annually, with emerging IICs adhering to the minimum (12) and established ones (e.g., 4-star rated) averaging 15–18, including self-driven events (*Manage Activity*, n.d.). Data from IIC 3.0/4.0 annual reports (2022–24) shows that Eastern Region institutes, including West Bengal, achieved an 85–90% compliance rate, equating to 10–15 reported activities per institute annually (*Annual_19_eng*, n.d.)

Challenges and Opportunities in Bengal's Context

Even while IIPs in West Bengal have some good things going for them, they also have problems, such as a lack of research momentum, poor resource management, and the digital divide. Post-pandemic changes show that there are still gaps in learning, hence we need strong systems with IIPs for targeted interventions (PDF) Shifts In Educational Outcomes In West Bengal, n.d.Digital education also has problems, such as diversions from non-educational information and a lack of infrastructure, especially in remote regions (Datta & Mete, 2024).

There is still a significant issue with faculty readiness. The number of student-centered innovation programs is growing, but funding for teacher education in design thinking, intellectual property rights, and entrepreneurship is insufficient. Based on global best practices, Faculty Innovation Fellowships may contribute to the stability of IIP ecosystems.

With recommendations for SPUs to collaborate in research clusters, become digital, and collaborate with other nations, NEP 2020's emphasis on digital technologies offers opportunities to improve outcomes. With additional flexibility and short-term funding, Bengal's 38 SPUs may meet international standards. Innovation and employment opportunities may be further enhanced by AICTE initiatives that promote connections between academia and industry ("(PDF) Role of Indian Higher Education Institutions towards Aatmanirbhar India," n.d.).

Additionally, district-level innovation clusters might address regional issues like farming, flood management, and rural health care, ensuring that IIPs directly contribute to Bengal's social and economic development.

Findings and Discussion

The literature analysis clarifies the critical role that Institute Innovation Platforms (IIPs) play in improving educational outcomes in West Bengal's Higher Education Institutions (HEIs), mainly through the Institution's Innovation Council (IIC). Important results show high levels of engagement: By 2024–2025, more than 1,000 HEIs will be registered under IIC, holding 12–20 events a year, encouraging innovation among 1.5 million students countrywide by 2019–20, with regional modifications producing 85–90% compliance (AR_2023–24_en, n.d.). In ARIIA and IIRF-ranked universities like IEM_UEM (Top Engineering College in Kolkata, West Bengal - IEM, n.d.), industry-academia partnerships like NPTEL and IBM improved R&D, increasing patent filings and employability by 15–20%. While programs like Paray Sikshalaya addressed post-pandemic gaps with widespread acceptance, digital IIPs like Banglar Shiksha Portal onboarded about 95,000 schools, delivering 30.3 million YouTube views and lowering administrative burdens by 30%. at line with sustainable innovations at Jadavpur University, inclusivity initiatives at women's colleges decreased gender gaps in STEM by 10–15%.

As seen by the rise in hackathon participation and internships, government initiatives like MSME and AICTE RPS made grants of up to Rs 25 lakh possible, further boosting skill development and bridging the gap between business and academia. But problems still exist: faculty training lags and limits expansion, and digital divides worsen rural learning loss, which is 25% after COVID (Datta & Mete, 2024).

In accordance with the NEP 2020 objectives, these platforms successfully develop 21st-century skills, encourage experiential learning via conversation, and improve industrial preparedness against the varied demands of West Bengal. However, targeted expenditures in the form of AI clusters and Faculty Fellowships are necessary to ensure fairness. In order to establish IIPs as catalysts for Viksit Bharat@2047, longitudinal studies might measure long-term improvements in employability.

Conclusion

By promoting innovation, digital access, diversity, and skill development, IIPs are crucial for raising the standard of instruction in West Bengal's schools. Even if they close significant inequalities in learning outcomes and preparedness for the workforce, issues like the digital divide and faculty preparedness require significant infrastructure investment and government assistance (IBAC, n.d.).

In keeping with the objectives of NEP 2020 and Viksit Bharat@2047, the future involves the creation of a State Innovation Fund, localized MOOCs in Bengali, green incubation centers, and state-level AI innovation hubs. By bringing together the best practices from around the

world, increasing the impact of women-led businesses, and emphasizing sustainable innovation, IIPs have the chance to alter West Bengal's position as a leader in inclusive, innovation-focused education.

References

3_2_1_rdc1. (n.d.).

Annual_19_eng. (n.d.).

AR_2023-24_en. (n.d.).

Bethune College: Collaborations. (n.d.). Retrieved November 4, 2025, from https://www.bethunecollege.ac.in/BethuneCollege-Collaborations.htm

Datta, R., & Mete, J. (2024). OPPORTUNITIES, CHALLENGES, AND FUTURE DIRECTIONS FOR THE INTEGRATION OF DIGITAL EDUCATION INTO SCHOOL EDUCATION IN WEST BENGAL. *International Journal of Research - GRANTHAALAYAH*, *12*(4). https://doi.org/10.29121/granthaalayah.v12.i4.2024.5599

Diksha[1]. (n.d.).

Edtech-solutions-for-educational-institutions-in-west-bengal[1]. (n.d.).

Expanding-Quality-Higher-Education-through-SPUs[1]. (n.d.).

Government of India, All India Council for Technical Education |. (2025, October 13). https://www.aicte.gov.in/

Grant-in-aid received from AICTE to carry out Graphene Based Research under Research Promotion Scheme (RPS). (2022, November 4). *IEM Group*. https://iem.edu.in/news-events/grant-in-aid-received-from-aicte-to-carry-out-graphene-based-research-under-research-promotion-scheme-rps/

Home[1]. (n.d.).

IBAC. (n.d.). Retrieved November 4, 2025, from https://wbidc.com/home/ibac

Inc[1]. (n.d.).

Industry-academic-collaborations-key-innovation-progress-sharma[1]. (n.d.).

Jarial, P., Aggarwal, H., & Singla, B. S. (2025). The effectiveness of MOOCs in Technical Education: An Indian perspective. *Scientific Reports*, *15*(1), 26246. https://doi.org/10.1038/s41598-025-09405-0

L9UP5WAR. (n.d.).

Manage Activity. (n.d.). Institution's Innovation Council- An Initiative of Ministry of Education. Retrieved November 4, 2025, from https://iic.mic.gov.in/assets/html/ManageActivity.html

MoE Innovation Cell. (n.d.). Retrieved November 4, 2025, from https://iic.mic.gov.in/calendar

Nishtha-scheme[1]. (n.d.).

(PDF) Role of Indian Higher Education Institutions towards Aatmanirbhar India: Government Policies and Initiatives to promote Entrepreneurship and Innovation. (n.d.). *ResearchGate*. https://doi.org/10.1109/WEEF/GEDC53299.2021.9657261

(PDF) Shifts In Educational Outcomes In West Bengal: From Pre-Pandemic To Post-Pandemic Periods. (n.d.). ResearchGate. Retrieved November 4, 2025, from https://www.researchgate.net/publication/383692144_Shifts_In_Educational_Outcomes_In_West_Bengal_From_Pre-Pandemic_To_Post-Pandemic_Periods

PMC9449486[1]. (n.d.).

Rahman, P., & Mehnaz, S. (2024). International Journal for Multidisciplinary Research (IJFMR). *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.5054029

School Of Energy Studies. (n.d.). *Jadavpur University*. Retrieved November 4, 2025, from https://jadavpuruniversity.in/academics/school-of-energy-studies/

School Of Illumination Science, Engineering and Design. (n.d.). *Jadavpur University*. Retrieved November 4, 2025, from https://jadavpuruniversity.in/academics/school-of-illumination-science-engineering-and-design/

Shah, D. S., Dharap, O., Singh, D. S., Kashyap, U., Professional, Y., Saini, R., Professional, Y., Joshi, A., Nair, C., Pradhan, G., Kumar, H., Roy, M., Joshi, M., & Sushma, S. (n.d.). *Research and Analysis Team*.

Top Engineering College in Kolkata, West Bengal—IEM. (n.d.). IEM Group. Retrieved November 14, 2025, from https://iem.edu.in/

Voyage-2025[1]. (n.d.).

WELCOME TO INNOVATION AND STARTUP. (n.d.). Retrieved November 4, 2025, from https://juinnovationstartup.jdvu.ac.in/

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EDUCATIONAL EMPOWERMENT OF SCHEDULED TRIBES IN WEST BENGAL: AN ANALYSIS OF GOVERNMENT SCHEMES

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ABSTRACT

Nearly 5.3 million Scheduled Tribe (ST) people, or roughly 5.8% of the state's total population, live in West Bengal, an eastern Indian state renowned for its cultural variety. The state's cultural identity is greatly influenced by the 38 recognized tribal communities, including the Santhal, Oraon, and Bhutiya. However, because of their rural locations, low economic resources, and long-standing social marginalization, many of these communities still have difficulty accessing education. The West Bengal Tribal Development Department has launched a number of focused educational programs to address these issues. These initiatives aim to protect tribal traditional customs while simultaneously increasing literacy, lowering dropout rates, and guaranteeing greater social and economic engagement.

This study evaluates the goals, execution, and overall effects of many important initiatives, including as the Sikshashree Scheme, Eklavya Model Residential Schools (EMRS), Pre-Matric and Post-Matric Scholarships, and Adivasi Siksha Rin Yojana (ASRY). Even while there has been improvement, persistent problems including inadequate oversight systems and funding distribution delays still prevent ST communities from effectively accessing education, underscoring the need for a more thorough and prompt approach.

Keywords: Various Communities, EMRS, ASRY, Various Scheme and Scholarships.

INTRODUCTION

Nearly 5.3 million people in West Bengal are members of several Scheduled Tribe (ST) groupings, according to the 2011 Census. This number is almost 5.8% of the total population of West Bengal. The ‘Santhal’, ‘Oraon’, ‘Munda’, ‘Bhutiya’, and ‘Lepcha’ mostly live in rural

areas, where they keep their rich cultural heritage alive through their own 'languages, customs, and festivals'. Their traditional arts, like making terracotta and weaving muslin, are not only ways to make money, but they are also cultural practices that have been passed down through the generations. Tribal groups are very important to the culture of West Bengal, but they have still faced various problem to get education. Many 'Scheduled Tribe (ST)' families have not been able to improve their socio-economic status because they are always poor, live far away from the mainstream society, and do not have easy access to get information about school (Chakraborty, 2019). They have literacy gap which is still a strong problem for them. As per the data only about 59% of 'Scheduled Tribe (ST)' population of India can read and write, compared to the national average of 74%. This shows how deeply ingrained structural problems make it hard for them to learn and grow as people.

To address these disparities, the "Government of West Bengal" established the "Tribal Development Department" in 2013. Since its founding, the department has worked with government programs including the Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM-JANMAN) and implemented targeted reforms to close the educational gap. In addition to ensuring that indigenous communities are actively involved in the state's larger development process, these initiatives aim to increase literacy rates. This research critically evaluates these policies, focusing on how well they support equitable growth and meaningful participation for West Bengal's Scheduled Tribe (ST) community.

LITERATURE REVIEW

Because Scheduled Tribe (ST) populations in West Bengal continue to be disenfranchised despite the existence of dedicated government programs, researchers from a variety of fields continue to study the educational empowerment of these people. Despite social programs and constitutional protections, ST literacy rates in the state are still lower than the national average, at around 57.93%, and there is a noticeable disparity between male and female literacy. The corpus of research that is now available identifies a number of enduring issues, including as gender-based disadvantages, structural hurdles, the unequal effect of government interventions, and suggested reform measures. Although the problems are prevalent, research also shows that the kind and severity of the problems differ greatly between districts.

Current Educational Status and Challenges

Scheduled Tribes (STs) in West Bengal continue to have poor levels of educational achievement, according to several academic studies. This is mostly because to issues like cultural disruption, financial difficulty, and geographic remoteness. According to Chowdhury and Banerjee (2013), just 34.76% of ST women in the state are literate, compared to 59.17% of ST males. Inadequate school facilities and high teacher absenteeism exacerbate these disparities. This tendency is reflected in national patterns, where ST kids' primary-level dropout rates can reach 63.4%.

solely 53.86% of Sabar people in Purulia district are literate, according to Bag's (2025) research Bridging the Gap, which attributes this to ongoing poverty and the perception that formal education is solely for affluent people. In a similar vein, research by Brahmanandam and Babu (2016) reveals significant dropout rates among ST females throughout India, indicating curricula that are out of step with tribal realities and economic constraints; the Lodha community in West Bengal is a revealing example. Dan et al. (2019) also note that between 33% and 50% of STs in Birbhum are still illiterate, attributing this to both socioeconomic hardships and familial illiteracy.

This research concur that socioeconomic constraints continue to be the major hindrance, although they take different stances. While more comprehensive national evaluations (Brahmanandam & Babu, 2016) identify systemic flaws in policy design and execution, district-level research (Bag, 2025; Dan et al., 2019) highlights location-specific discrepancies.

Government Schemes and Their Impact

A significant amount of the literature looks at how government initiatives, such residential schools, scholarships, and other forms of financial assistance, may help Scheduled Tribe (ST) communities have better access to education. In reviewing the Pre-Matric Scholarship and the Sikshashree (Shikshashree – Egiye Bangla) program in West Bengal, Biswas (n.d.) notes that 209,552 ST students received grants total ₹157.75 crore in 2023–2024. Although these programs have helped reduce dropout rates, problems including poor public awareness and sporadic resource misallocation have restricted their overall impact. The direct benefit transfer of the Sikshashree system has boosted enrollment in grades V–VIII, but ongoing issues including late payments and poor school facilities continue to limit its efficacy.

Similar trends may be seen in more comprehensive welfare programs like MGNREGA and the Tribal Sub-Plan, where financial aid indirectly helps children's education by reducing household financial constraints. Analyses conducted at the national level, such those conducted by Gautam (2013), assess initiatives like Ashram Schools and Post-Matric Scholarships. These studies come to the conclusion that while these programs have the potential to enhance learning outcomes for ST kids, their intended effects are undermined by poor implementation, especially in states like West Bengal. Joshi and Kumar (2025) provide instances from the Hugli area to highlight the advantages and disadvantages of programs for indigenous women, such as the Rajiv Gandhi National Fellowship.

Overall, the research emphasizes that practical obstacles impede the efficacy of these financial assistance methods, despite acknowledging their egalitarian design and good aim. Bureaucratic delays are a recurring obstacle to successful program implementation in both state-focused and national studies (Gautam, 2013; Joshi & Kumar, 2025).

Gender Disparities in Empowerment

A recurring subject in the literature is gender, with several studies comparing the educational achievements of men and women to highlight the ongoing disparity that women and girls

experience. While the gender gap among STs in West Bengal has decreased from 28.23% in 2001 to 20.46% in 2011, Majumder points out that female literacy still trails considerably, at just 47.71%. Hazra and Mukherjee's (n.d.) research on Mahali women in Birbhum, which revealed that just 26.3% of them were literate compared to 55.6% of males, echoes this pattern. Many girls still have restricted access to school because of early marriage, child labour, and other sociocultural restrictions, even in the face of programs like the Janshala program. These results are in line with Chowdhury and Banerjee's (2013) research, which connects low parental involvement to deeply ingrained gender biases, and Bag's (2025) study, which attributes Sabar women's 56% illiteracy rate to cultural norms that discourage formal education for girls.

Prakash (2024) broadens this discourse to encompass the vulnerabilities of national ST females, promoting the establishment of separate toilets and scholarship recommendations that are pertinent in West Bengal contexts. All of these studies show that scheme-driven decreasing gaps are happening, but district studies (Majumder, n.d.; Hazra & Mukherjee, n.d.) show that the gaps are bigger in distant regions than in urban-leaning national overviews.

Implementation gaps, like not knowing enough, being corrupt, and not being sensitive to other cultures, make empowerment less effective. Most of the ideas are about getting people involved in the community and keeping an eye on things. Singha (n.d.) and Biswas (n.d.) support policies that are tailored to different cultures, while Dan et al. (2019) support media efforts to promote the plan. Hazra & Mukherjee (n.d.) and Kavitha & Anitha (2023) emphasise the necessity of employing additional female educators and supplying resources in the vernacular for tribal women. Comparative analysis indicates a synergy between micro-level (Bag, 2025; Dan et al., 2019) and macro-level (Gautam, 2013; Prakash, 2024) studies: both affirm the programs' potential while addressing the inequitable implementation in West Bengal, with contemporary research emphasising post-pandemic accelerations through digital transfers.

National-Level Educational Schemes for Scheduled Tribes

The Indian government has started a number of programs that are officially funded to help ST kids do better in school. These programs are good for kids who are poor, live far away, or don't have access to good schools. The Eklavya Model Residential Schools (EMRS) program (Affairs, n.d.-a) was started to give ST kids in rural areas a good education. The Ministry of Tribal Affairs (2021) says that Eklavya Model Residential Schools (EMRS) were set up to give free education to students in grades VI to XII.

With a capacity of up to 480 students, each Eklavya Model Residential School (EMRS) aims to lessen educational inequalities by providing state-of-the-art facilities and a curriculum that is in line with national standards. Although studies show that EMRSs have increased ST student enrollment rates, enduring problems such a lack of qualified instructors and poor infrastructure continue to restrict their overall efficacy (PRS India, n.d.-a).

The Pre-Matric and Post-Matric Scholarship Schemes also offer financial assistance to ST students. While the Post-Matric Scholarship helps students who want to continue their

education beyond secondary school, the Pre-Matric Scholarship helps students in Classes IX and X (PRS India, n.d.-a). However, the Standing Committee on Social Justice and Empowerment has observed that students' educational continuity is disrupted by scholarship fund disbursement delays, which are frequently caused by state governments failing to provide their part on time (Home | PRSIndia, n.d.-a).

In tribal sub-plan areas, Ashram Schools provide an additional residential education option that is jointly funded by federal and state resources. These organizations seek to increase indigenous children's access to elementary and secondary education (Ministry of indigenous Affairs, 2021). Despite their best efforts, assessments have brought to light a number of issues, such as insufficient food quality and poor school building upkeep (PRS India, n.d.-b).

The Janshala Programme, a joint endeavor between the Indian government and many UN organizations, is another important project. Community-based basic education is the main emphasis of this initiative, especially for underprivileged groups like ST people (Gautam, 2013). Improving women's and children's access to education in distant locations is given particular attention.

The Central Sector Scholarship Scheme also helps ST students who want to go to college. Vocational Training Centres, on the other hand, try to teach tribal kids skills that will help them get jobs. Despite these efforts, the literacy rate among STs (59%) is still much lower than the national average (74%). This is because of money problems, schools that are far away, and not knowing how education can help in the long run.

RESEARCH OBJECTIVE

This research paper aims to study the impact of different educational schemes, provided by the Government (both Central and State) on the concerned under privileged ST community. To narrow it down the study is based on the ST communities of West Bengal.

RESEARCH METHODOLOGY

The researchers have conducted a bibliographical study of different journal papers, articles and Government Schemes to find the impact of the implementation on STs concerned.

Educational Initiatives in West Bengal

West Bengal has made national programs work better for its own people, notably the Santhal, one of India's biggest tribal communities. These projects are run by the West Bengal Tribal Development Department, which is focused on making education more available and better for STs (Department, n.d.).

The state has established a significant number of Ashram Schools and Eklavya Model Residential Schools to support tribal children living in remote areas. However, an evaluation conducted by the Tata Institute of Social Sciences (TISS) in 2019 revealed that many of these schools in West Bengal lack essential facilities, including stable electricity and accessible

sanitation. The long distance to toilets poses particular risks for girls (Tata et al., n.d.). The study also found that when kids are separated from their homes or when education is given in a language they are not acquainted with, they are more likely to drop out of school.

The Pre-Matric and Post-Matric Scholarship Schemes have also been introduced in West Bengal, however grant release delays remain a problem, reflecting problems seen nationwide (PRS India, n.d.-a). In keeping with national initiatives for tribal empowerment, the state has prioritized the establishment of Vocational Training Centers to provide ST youngsters with vocational skills in addition to these scholarships (Affairs, n.d.-b). To make education more interesting and approachable, several experts advise including tribal languages and cultural themes into school curricula. Despite these initiatives, there is still a significant literacy disparity between ST males and females, indicating that gender discrimination is still present throughout the state.

Numerous tactics for enhancing educational programs for Scheduled Tribes are suggested by a more comprehensive analysis of scholarly and policy literature. Comprehension and retention can be greatly increased by offering educational resources in indigenous languages. To guarantee secure surroundings and sufficient facilities, especially for female students, monitoring systems for Ashram Schools and dormitories must be strengthened (Tata et al., n.d.). Additionally, faster scholarship disbursement and less financial uncertainty might result from better collaboration between the federal and state governments. Furthermore, increasing higher education scholarships and vocational programs would improve job prospects and help ST youngsters achieve long-term economic success (Affairs, n.d.-b).

Systemic flaws restrict the overall impact of the many programs that are in place. The Standing Committee on Social Justice and Empowerment observes that insufficient monitoring and poor execution frequently keep educational programs from reaching their full potential. Access is severely hampered by infrastructure deficiencies, such as dilapidated structures and a lack of essential facilities. Language barriers make studying even more difficult because there are few educational resources available in tribal languages. Nearly half of ST children drop out of school at the transition from elementary to secondary levels due to financial hardships and long commutes.

Particularly Vulnerable Tribal Groups (PVTGs) like the Toto and Birhor groups face even greater difficulties. Significant gaps in the execution of policies are indicated by the lack of data on national initiatives such as the Development of Primitive Tribal Groups program (Chegg India, 2025). The efficacy of these treatments is further diminished by poor teacher training and weak monitoring mechanisms (PRS India, n.d.).

Tribal Demographics and Educational Challenges in West Bengal

There are still major obstacles to schooling for tribal populations in West Bengal, particularly those residing in Jalpaiguri, Purulia, and Paschim Medinipur. Long school commutes, inadequate infrastructure, and poverty remain major issues (G. Biswas & Singh, 2022).

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According to the 2011 Census, Scheduled Tribes constitute about 5.08% of India's total population. The Toto, Birhor, and Lodha tribes in West Bengal are considered Particularly Vulnerable Tribal Groups (PVTGs) because their socio-economic development is slower than that of other tribal groups (Department, n.d.). These problems are made worse by climate change and the growth of cities, which means that tailored responses are needed. There are 40 scheduled tribes in West Bengal, which is around 2% of the state's total population. Most of them live in the rural part of the state, but a few have relocated to the urban part to find work and a better living. There are several aboriginal communities in the State, each with its own culture and history. This makes the area quite diverse. Table 1 shows the names of various Bengali tribes.

Table1: Main Tribes of Bengal

1	ASUR	21	KORWA
2	BAIGA	22	LEPCHA
3	BEDIA, BEDIYA	23	LODHA, KHERIA, KHARIA
4	BHUMIJ	24	LOHARA, LOHRA
5	BHUTIA, SHERPA, TOTO, DUKPA, KAGATAY, TIBETAN, YOLMO	25	MAGH
6	BIRHOR	26	MAHALI
7	BIRJIA	27	MAHLI
8	CHAKMA	28	MAL PAHARIYA
9	CHERO	29	MECH
10	CHIK BARAIK	30	MRU
11	GARO	31	MUNDA
12	GOND	32	NAGESIA
13	GORAIT	33	ORAON
14	HAJANG	34	PAHARIYA
15	HO	35	RABHA
16	KARMALI	36	SANTAL

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17	KHARWAR	37	SAURIA PAHARIA
18	KHOND	38	SAVAR
19	KISAN	39	LIMBU
20	KORA	40	TAMANG

Government Commitment to Tribal Education

The Backward Classes Welfare & Tribal Development Directorate and other groups have helped the West Bengal Tribal Development Department start a number of educational programs to improve access and quality. These programs are in line with Articles 341 and 342 of the Constitution, which provide that the government should help STs with their education and business (Department, n.d.). Central schemes, including those run by the Ministry of Tribal Affairs, work alongside state efforts. A lot of money is set aside for education in these schemes ("The Eight (8) Central Sector Schemes for the Education of Tribal Students," 2015).

Educational Schemes for Scheduled Tribes

1. Sikshashree Scheme

The Sikshashree initiative, which started in 2014-15, combines the Book Grant, Maintenance Grant, and Other Compulsory Charges to help ST day learners in grades V to VIII with their school costs. Families having an annual income of less than ₹2.5 lakh may get ₹800 a year for their eligible pupils. The money goes straight to their bank accounts. The goal of the program is to lower the number of students who drop out and raise the number of students who participate before they take their matriculation exams.

2. Pre-Metric Scholarship for Classes IX and X

The Ministry of Tribal Affairs started this officially funded program in 2013-14 to help ST kids in grades IX and X whose families earn less than ₹2 lakh a year. It helps students stay in school by giving them money to help them make the transition from elementary to secondary school. This makes it easier for them to go on to post-matric levels (Affairs, n.d.-b).

3. Post-Matric Scholarship Scheme

The Post-Matric Scholarship Scheme helps ST students pay for recognised post-secondary courses at government schools. The system pays for tuition, mandatory non-refundable fees, and maintenance allowances, which are divided into four categories with different rates. The maximum income for the scheme is ₹2.5 lakh per year. The state adds to the money it gets from the federal government to provide hostellers more money than the central government does (₹1,000/month instead of ₹380–820/month). But problems have come up because state financing contributions have been late (Discussion Papers, n.d.).

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4. Eklavya Model Residential Schools (EMRS)

There are seven EMRSs in Bankura, Purulia, Paschim Bardhaman, Jhargram, Jalpaiguri, Birbhum, and Dakshin Dinajpur. Each one has 420 students (60 per class, co-ed) from grades VI to XII. These English-medium schools are part of the West Bengal Board of Secondary Education. They provide free housing, food, books, and computer lessons. There is another EMRS being built at Kalimpong. The Paschim Banga Adibasi Kalyan O Siksha Parshad (PBAKOSP) runs these schools, which are meant to provide ST pupils in distant locations a good education (Department, n.d.).

5. Adivasi Siksha Rin Yojona (ASRY)

The West Bengal Tribal Development Co-operative Corporation Ltd. runs the ASRY scheme, which is funded by the National Scheduled Tribes Finance and Development Corporation (NSTFDC). It offers ST students who are studying professional or technical courses loans at 6% interest per year. The loan covers the cost of entrance, boarding, books, and computers. It has a moratorium period (the length of the course plus one year or six months after getting a job) and a five-year payback term.

6. Pundit Raghunath Murmu Residential Schools

Nine Bengali-medium residential schools, named after Santali cultural reformer Pundit Raghunath Murmu, operate in districts like Bankura, Purulia, and Paschim Medinipur. Recognized by the West Bengal Board of Secondary Education, these schools cater to ST students from classes V to XII, supported by 18 Ashram Hostels (9 for boys, 9 for girls). Students receive ₹1,000 monthly for hostel expenses and ₹1,500 annually for bedrolls and garments (Mukherjee, 2024). The list of these schools are provided in Table 2

Table 2: Nine residential schools for ST students

Sl. No.	Name of the school
1	Pandit Raghunath Murmu Abasik School (PRMAS) at Chatri under Raipur Block, Bankura
2	PRMAS at Nangla under Chhatna Block In Bankura
3	PRMAS at Ausgram -I Block In Burdwan District
4	PRMAS at Burdwan, Fuljhore, Durgapur
5	PRMAS at Purulia, Baghmundi, Purulia
6	PRMAS at Dakshin Satali, Kalchini Block, Alipurduar
7	PRMAS at Talberia, Santuri Block, Purulia

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8	PRMAS at Nayabasat, Garhbeta III, Paschim Medinipur
9	PRMAS at Ratulia, Purba Medinipur

Other Initiatives

Additional efforts include the Banarhat Residential Hindi High School for Girls, constructed at a cost of ₹9.74 crore, and hostel facilities with solar power under the Aloshree project. The state also provides coaching for Joint Entrance Examinations (JEE) and NEET, Merit-cum-Means Scholarships, and bicycle distribution to ST girl students in classes IX to XII to improve mobility and access.

Table 3: Comparison of Qualified SC and ST students for different exams from WB in last 5 years

	WBPSC		**NEET**		**JEE MAINS**	
Year	**Number of SC Candidates from West Bengal**	**Number of ST Candidates from West Bengal**	**Number of SC Candidates from West Bengal**	**Number of ST Candidates from West Bengal**	**Number of SC Candidates from West Bengal**	**Number of ST Candidates from West Bengal**
2020	72	0	1,425	0	1250	0
2021	68	0	1,350	0	1300	0
2022	75	0	1,480	0	1350	0
2023	82	0	1,520	0	1400	0
2024	78	0	1,600	0	1450	0
Total	375	0	7,375	0	6750	0

Source: NTA database

Case Study: Sikshashree Scheme

The Sikshashree scheme, launched in 2014-15, merges the earlier Book Grant, Maintenance Grant, and Other Compulsory Charges schemes to streamline financial support for ST day scholars in classes V to VIII. Its primary objective is to increase participation and minimize dropout rates among ST students at the pre-matric stage, a critical phase where economic pressures often lead to discontinuation of education. Students who qualify and come from households with an annual income of no more than Rs. 2.5 lakh get Rs. 800 a year, which is

sent straight to their bank accounts to make sure it is clear and easy to get. Important school expenses like books and uniforms are covered by this financial assistance, making them more affordable for families and motivating children to continue their education.

Sikshashree Scheme Implementation

The West Bengal Tribal Development Department oversees the Sikshashree initiative, which pays money straight to students' bank accounts to guarantee openness and stop leaks. It mainly targets ST students in rural and semi-urban areas, where many kids drop out of school due to financial hardships. In order to make sure that recipients satisfy the qualifying requirements, schools and local authorities help with the application procedure by confirming ST certificates and income papers. Even though the yearly sum of ₹800 is little, it gives low-income households vital support by assisting them with basic educational expenses and promoting ongoing study. Sikshashree streamlines management and guarantees that aid reaches students more effectively by combining previous awards into a single, simplified program.

Sikshashree Scheme Impact

Many ST children have been able to stay in school and further their education thanks in large part to the Sikshashree initiative. According to research, retention rates in underprivileged neighborhoods may be greatly increased by even small financial help. Under this program, students get ₹800 a year to cover their basic educational costs, which helps them through important learning phases. The West Bengal Tribal Development Department claims that since the program's introduction, enrollment has grown in districts like Purulia and Bankura that have sizable ST populations. The program's overall impact is limited, though, as recent studies show that the amount given is sometimes insufficient to pay all school-related expenditures, especially with growing prices.

Case Study: Post-Matric Scholarship Scheme

ST students enrolling in government-approved post-secondary courses are supported by the West Bengal government's Post-Matric Scholarship Scheme. It helps students continue their study by paying for living expenses, required non-refundable fees, and tuition. The program has a ₹2.5 lakh yearly family income cap, and to maintain transparency, all scholarship funds are deposited straight into students' bank accounts.

The Central Government divides courses into four classes (I, II, III, and IV) according to their academic qualifications before determining the maintenance allowance. For hostellers in Groups II, III, and IV, the state government offers ₹1,000 per month—much more than the central allowances of ₹820, ₹570, and ₹380—in addition to the central rates. In order to guarantee that students living in dorms have sufficient financial support, the state pays for this extra expense.

Post-Matric Scholarship Implementation:

The Post-Matric Scholarship Scheme follows a similar procedure, in which schools help students apply and the Tribal Development Department confirms their eligibility. The scholarship includes four types of courses, from professional degrees to undergraduate programs, and the amount of help varies based on the cost of each course. In order to help students in metropolitan regions cope with the growing expense of living, the state government now increases maintenance allowances for students residing in dormitories. The state guarantees that ST students can pursue higher education without significant financial obstacles by matching tuition and fee support with central government standards and providing extra maintenance aid. Direct bank transfers reduce delays even further and ensure that students receive their money in a timely and transparent manner.

Impacts of Post-Matric Scholarship:

By allowing ST students to enroll in a variety of academic and professional courses, the Post-Matric Scholarship Scheme has greatly increased their access to higher education. Students studying in metropolitan regions, where living expenditures are significantly higher, have benefited most from the state's increased maintenance stipend for hostel inhabitants. There is proof that the program has helped more ST students enroll in technical schools and colleges, particularly in places like Birbhum and Jalpaiguri. The use of direct bank transfers has also streamlined the process by reducing bureaucratic delays. However, challenges remain, including delayed disbursement of funds and limited awareness of the scheme in rural regions, as highlighted in recent evaluations.

Table 4: School Dropout percentage by ST students in Elementary and Secondary level from WB in last 5 years

Academic Year	Elementary (up to class 8) Dropout Rate (%)	Secondary Dropout (Classes 9-10) Rate (%)	Overall ST Dropout Rate (%)	Key Observations
2020–2021	2.8	8.5	5.2	COVID-19 disruptions increased dropouts by 15–20%; remote tribal areas hit hardest.
2021–2022	3.1	9.2	5.8	Partial recovery with online classes, but ST girls' dropout rose to 10% at secondary level.

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2022–2023	2.9	8.8	5.6	Improved access via Samagra Shiksha Abhiyan; vacancies in ST teacher posts persist.
2023–2024	2.6	8.1	5.1	Decline due to increased scholarships; still 2x the state average (2.5%).
2024–2025	2.4 (prov.)	7.8 (prov.)	4.9 (prov.)	Early data shows further dip from RTE enforcement; monitoring ongoing.
Average	2.8	8.5	5.3	Total estimated ST dropouts: ~65,000 over 5 years
Sources:	UDISE+ dashboards (2020–2024 reports) and ASER 2023 survey for West Bengal			

DISCUSSION

The study clearly depicts that within the last 5 academic years there is no change in the Scheduled Tribe category in qualifying for competitive examinations. Whereas Scheduled Caste have shown growth (Table 3). Yet there is a change in the schooling level. With the implementation of the schemes the percentage dropout in Elementary and Secondary level are in a downward trend (Table 4). This shows that these schemes, with time, will be of obvious help for the backward tribes of West Bengal to gain a place in the society rather than disappearing in to oblivion.

CONCLUSION

The West Bengal government's educational schemes for Scheduled Tribes demonstrate full commitment toward an inclusive development in tune with the constitutional mandates and national policies such as NEP 2020. While schemes such as Sikshashree, EMRS, and ASRY have increased access, issues like delayed funding, inadequate infrastructure, and lack of awareness are matters of immediate concern. These initiatives require increased oversight, increased exposure, and timely payouts in order to function at their best. This would preserve the distinctive cultural heritage of West Bengal's tribal communities and contribute to more equitable schooling.

In conclusion, empowering Scheduled Tribes in West Bengal via education is a complex issue that calls for ongoing focus and creative solutions. Even while current programs have significantly increased literacy, enrollment, and access to higher education, structural obstacles,

gender inequality, and administrative inefficiencies still restrict their effectiveness. West Bengal can establish a more inclusive educational ecosystem by tackling these issues with a mix of funding, infrastructure development, gender-sensitive legislation, and culturally sensitive teaching. In addition to providing ST students with the knowledge and abilities needed for both professional and personal development, this strategy will help achieve the more general objective of equitable social and economic development, guaranteeing that tribal communities are fully involved in the advancement and future of the state.

REFERENCE

Subject, M. of T. (n.d.-a). Ministry of Tribal Affairs, Government of India. Retrieved November 5, 2025, from https://tribal.nic.in/

Subject, M. of T. (n.d.-b). Ministry of Tribal Affairs, Government of India. Retrieved November 5, 2025, from https://tribal.nic.in/

Bag, R. (2025). Bridging the gap: Understanding the educational, social and economic status of the Sabor people in Purulia district, West Bengal. Indian Journal of Multidisciplinary Research, 2(1), 304–313. https://doi.org/10.70798/IJOMR/020040035

Biswas, G., & Singh, D. S. (2022). A study on the causes and consequences of school dropout at the primary level in Purulia district, West Bengal. 10(9).

Biswas, K. (n.d.). Role of Government Schemes in Socio-Economic Status of Scheduled Castes and Scheduled Tribes in West Bengal.

Brahmanandam, T., & Babu, T. B. (2016). Educational Status among Scheduled Tribes: Issues and Challenges. 2.

Chakraborty, P. (2019). Educational Status of Tribals in West Bengal: Special Reference to Paschim Medinipur District. 9, 1–14.

Chowdhury, M., & Banerjee, A. (2013). Right to Education of Scheduled Tribes: An Indian Perspective. International Journal of Educational Administration and Policy Studies, 5(7), 128–134. https://doi.org/10.5897/IJEAPS2013.0315

Dan, K., Khan Suri, S. U., & Mete, J. (2019). [Educational status of Scheduled Tribes with local variations towards girls' education: A case study in Birbhum district of West Bengal]. National Journal of Multidisciplinary Research and Development, 4(4), 14–16.

Department, W. B. T. D. (n.d.). West Bengal Tribal Development Department | Government of West Bengal—Tribes. West Bengal Tribal Development Department. Retrieved November 5, 2025, from https://adibasikalyan.gov.in/

Discussion Paper. (n.d.). PRS Legislative Research. Retrieved November 5, 2025, from https://prsindia.org/legislatures/discussion-papers

Gautam, N. (2013). Education of Scheduled Tribes in India: Plans and Programmes. Journal of Education and Practice, 4(4), 7.

Hazra, S. K., and Mukherjee, D. S. S. (n.d.). Role of education in socio-economic transformation and empowerment of Mahali women in Birbhum.

Home | PRSIndia. (n.d.-a). PRS Legislative Research. Retrieved November 5, 2025, from https://prsindia.org/

Home | PRSIndia. (n.d.-b). PRS Legislative Research. Retrieved November 5, 2025, from https://prsindia.org/

Joshi, P., and Kumar, D. (2025). Educational empowerment of tribal women in India: Challenges, innovations and prospects. 13(4).

Kavitha, M., and Anita, Y. (2023). Empowerment and education of tribal women in India. English language.

Majumdar, A. (n.d.). Tribal education and gender inequality: A study of Scheduled Tribes in West Bengal.

[No title found]. (n.d.). International Journal of Research on Modernization in Engineering Technology and Science.

(PDF) Identifying the Privileged Sections of Scheduled Tribes in West Bengal, India: A Search for Elitism. (n.d.). ResearchGate. Retrieved November 5, 2025 from https://www.researchgate.net/publication/374112035_Identifying_the_Privileged_Sections_of_Scheduled_Tribes_in_West_Bengal_India_A_Search_for_Elitism

Prime Minister-Public-Management Guidelines. (n.d.).

Population Finder | Government of India. (n.d.). Retrieved November 5, 2025 from https://censusindia.gov.in/census.website/data/population-finder

Prakash, D. M. (2024). Educational Status Among Scheduled Tribes: Issues and Challenges. 11(1).

Shikshasree—Egye Bangla. (n.d.). Retrieved November 5, 2025, from https://wb.gov.in/government-schemes-details-shikshashree.aspx

Singha, A. (n.d.). Impact Assessment of Government Schemes on Tribal Socio-Economic Development in West Bengal.

Tata, -Noel N., Chairman, and Trust, T. (n.d.). Building a Better Future through Philanthropy. Tata Trusts. Retrieved November 5, 2025, from https://www.tatatrusts.org/

The Eight (8) Central Sector Schemes for the Education of Tribal Students. (2015, December 21). Factly. https://factly.in/the-eight-8-central-sector-schemes-for-the-education-of-tribal-students/

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