Tribute to Late Dr. I. S. Subhedar

The man who motivated his students and colleagues in a real sense to think big and work better to leave behind a pathbreaking legacy. Editor-in-Chief, National Conveners, Local Conveners of the National Conference, and Guest Editors are giving tribute to him by publishing this special on the occasion of silver jubilee year of the *South Asian Journal of Participative Development* by Centre of Social Research and Development, Pune.

South Asian Journal of Participative Development

C O N T E N T S

Vol. 25: No. 2 (Spl) **July –Dec: 2025**

E D I T O R I A L

It is with profound satisfaction and reflective pride that I present this Silver Jubilee Special Issue of the *South Asian Journal of Participative Development*, marking twenty-five years of an uninterrupted journey dedicated to scholarship, social inquiry, and participatory development. When the journal was launched a quarter of a century ago under the banner of the Centre for Social Research and Development (CSRD), Pune, it emerged from a commitment to build an academic platform that would nurture scientific thinking and strengthen the foundations of evidence-based practice across social sciences. In my very first editorial, written twenty-five years ago, I had expressed the aspiration that the journal would one day evolve into an "environment-friendly academic endeavour," striving toward the vision of a paperless office and sustainable scholarship—a vision that today, in the digital era, has become not only relevant but necessary. The journey from those early ideals to our present milestone has been shaped by perseverance, academic integrity, and an unwavering commitment to meaningful research.

Over these twenty-five years, the journal has published seventy-five regular issues and more than ten special issues that reflect the diverse developmental concerns of South Asia. The journal has remained a non-commercial, professional, and academically independent platform supported by CSRD, an institution established more than thirty-five years ago by dedicated social workers and social scientists. The aim has always been to disseminate knowledge without commercial intent, with the belief that social science scholarship must remain accessible to students, teachers, practitioners, and rural and urban communities alike. The journal's recognition by UGC and the appreciation it has earned from universities, research institutions, and academic bodies across the country testify to its academic credibility and sincerity of purpose.

This Silver Jubilee Special Issue is being released at the National Conference on "Research and Development in the Era of Artificial Intelligence: Strengthening Research to Achieve Viksit Bharat @ 2047." The theme itself reflects the transformation unfolding in contemporary academia. Artificial Intelligence has rapidly emerged as both an enabler and a disruptor of research practices. On one hand, AI empowers scholars with advanced analytical tools, accelerates data processing, enhances methodological rigor, and democratizes access to global knowledge. On the other, the growing misuse of AI—ranging from plagiarism and fabricated data to algorithmic shortcuts—poses serious ethical challenges to the credibility of academic output. As we celebrate this Silver Jubilee, it becomes essential to reaffirm the values of integrity, originality, and human intellect in research. Artificial Intelligence can guide, assist, and enrich academic inquiry, but it cannot replace critical thinking, field engagement, or the lived experiences that shape authentic social research. This journal will continue to uphold these values and remain vigilant about the evolving challenges that the academic community must navigate.

The *South Asian Journal of Participative Development* has, over the years, served as an important platform for young scholars who published their first scientific papers with us. Hundreds of academicians have been encouraged, guided, and shaped by this journal

during their formative years. In this sense, the journal has not merely documented social realities—it has participated in building the scholarly capacity of a generation. As India advances toward the vision of Viksit Bharat 2047, journals such as ours will play an increasingly vital role in ensuring that research remains socially relevant, ethically grounded, methodologically sound, and future-looking. The journal aspires to continue attracting high-quality articles across disciplines, promoting scientific temper, fostering collaborative knowledge, and supporting the emergence of new voices in academia.

The Silver Jubilee Special Issue embodies these aspirations. The articles presented here span evidence-based social work practices, participatory models, child welfare, youth development, technological innovations, and the emerging interplay between Artificial Intelligence and social sciences. The contributors include young researchers, mid-career scholars, and senior academicians whose work collectively represents the dynamism of contemporary research. The diversity of perspectives enriches the discourse and reinforces the journal's long-standing commitment to multidisciplinary scholarship.

As Editor-in-Chief, I take this opportunity to express my deep gratitude to the distinguished members of our national and international editorial board, our guest editors, reviewers, and collaborators whose expertise and guidance have shaped the academic quality of the journal. I also acknowledge with appreciation the support of universities, research centres, and field-based organisations that have partnered with us in bringing out regular and special issues. Above all, I extend my heartfelt thanks to the contributors and readers whose trust and engagement have sustained the journal's relevance and vitality for twenty-five years.

Looking ahead, the journal remains committed to advancing ethical research practices, encouraging digital and environmentally conscious modes of publication, promoting responsible use of AI-based tools, and ensuring that the scholarship we publish continues to contribute meaningfully to society. As we enter the next phase of our journey, we reaffirm our mission to remain an inclusive, non-commercial, and academically rigorous platform dedicated to participative development and social transformation.

With a renewed spirit and a collective commitment to the values that have shaped our past, I proudly dedicate this Silver Jubilee Special Issue to all scholars, practitioners, and institutions who believe in the transformative power of research. May the coming years strengthen our resolve to build knowledge systems that illuminate the path to a just, equitable, and Viksit Bharat @ 2047.

Dr. B. T. Lawani
Editor-in-Chief
South Asian Journal of Participative Development

GUEST EDITORS

This special issue is the result of contributions made by serious academicians, field practitioners and research scholars from trans-disciplinary subjects containing scholarly articles both thematic and empirical in response to call of the National Conference on "Research and Development in the Era of Artificial Intelligence: Strengthening Research for Viksit Bharat @ 2047" on the eve of Celebration of the Silver Jubilee Year of South Asian Journal of Participative Development. It has the articles with combination of evidence based studies focus on intervention field work and intervention research. Further good numbers of papers are studies are pertaining to them of the conference.

At the outset, Sinu Jesin T and Dr. Janaki Raman *critically examined how different evidence-based models in social case work contribute to effective assessment and intervention for clients with complex psychosocial needs.* Shaurya Prakash, Kheyali Roy and Kannappa V Shetty *synthesise the evidence-based group work strategies for preventing substance abuse among Indian adolescents, bringing international research to the forefront and tying it with Indian settings.* Gangadhar B. Sonar attempts to make multi-module training interventions with post graduate social work students in order to equip them with required skills, knowledge and competencies for better community engagement and practice community organization method during social work camp. Prakash S. Yadav *conducted participatory action research study with women in which the need assessment study was conducted and based on that the social work intervention was adopted through capacity building and training programs such as Poultry farming, Dairy development, Goat farming and Mushroom farming for generating sustainable livelihood opportunities.* Channaveer R. M and Lokanath Sahoo advocate for *Evidence Based Practice as essential for strengthening child welfare outcomes, intervention, implementation in welfare agencies.* Yerriswamy V and Pavitra R. Alur *investigated the effectiveness of the experiential learning Method as a strategy for Language Skills development of school children in Ballari Urban.*

Bhaskar Vishnu Igawe and Kirtimala Shankar Parab advocate *use of ITS for inclusivity, supportive learning and enhancing teacher's potential in achieving the learning outcomes irrespective of the individual differences, providing insights to the stakeholders to plan and design the curriculum so as to leverage the AI's potential in the form of ITS in the education positively.* Madan Mohan Goel highlights the fusion of R&D, AI, and Needonomics represents the next evolution in India's development journey. Needonomics provides the philosophical depth, R&D provides the innovative engine, and Needo-Governance provides the ethical framework. Together, they ensure that progress serves humanity, not the other way around. As we step into an AI-powered future, Bharat must embrace the wisdom of *"Yogah Karmasu Kaushalam"* excellence in action with purpose and balance. Sanjoy Roy and Rituparna Dey state that by 2047, India aspires to become a knowledge super-power—a nation where innovation is indigenous, inclusive and impactful. An AI-enabled R&D ecosystem will be instrumental in realising this vision through multiple dimensions.

Nanthini Sri. M.I and V. Krishna Kumari *evaluate the effectiveness of such campaigns by determining the level of consumer awareness and by investigating the perceived effectiveness of support, which is restricted to cash or product donations, based on brand-cause fit.* S Akshal Hepzibah and B Dhana Lakshmi *assess the impact between AI Chatbot services, confirmation, trust, and purchase intention in Quick commerce platforms.* Rakesh Kumar Kaushik, Amita, Kshama Jitendra Kakade and Sunita Sinha *examine how Artificial Intelligence (AI) is being integrated into special and inclusive education.* A. Suryanarayana and Aluvala Ravi *studied the synergistic prospects of participatory research and technology-mediated knowledge creation within the vision of Viksit Bharat 2047.* Surbhi Bhalla and Sarita Anand *explore how gender norms affect adolescents' aspirations and expectations for themselves and their peers of the opposite sex.* Sudhanshu Kumar and Bishnu Mohan Dash *review ICDS's objectives, scope, and implementation, and analyse demographic trends in Bihar using NFHS-5 and government data.*

(Prof. Gangadhar B. Sonar) **(Prof. Sandeep B Jagdale)**

South Asian Journal of Participative Development
Vol.25, No.2 (Spl.), July - Dec. 2025
ISSN No: 0976-2701

Evidence-Based Practice in Social Case Work: Strategies for Effective Assessment and Interventions

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Abstract

Social Case work, established by pioneers like Richmond and Perlman, has traditionally focused on enhancing individual social functioning and adjustment. Over time, it has adopted structured, research-driven models to meet the evolving challenges of diverse client populations, especially those experiencing chronic mental health issues and complex vulnerabilities. Aim of the paper is to critically examine how different evidence-based models in social case work contribute to effective assessment and intervention for clients with complex psychosocial needs. A qualitative case study method was used. This approach involved an in-depth examination of a single case- detailing experiences, interventions, and outcomes- within the rehabilitation process. Data obtained from observation, documentation, and analysis of the client's interactions and responses to psychosocial interventions. Results indicate that persons receiving structured, evidence-based, multidisciplinary interventions experienced improvements in emotional stability, insight, and engagement with rehabilitation activities. Despite challenges such as language barriers and limited family support, individualized and community-based interventions enable positive outcomes and greater autonomy for individuals. However, institutional gaps- particularly in cultural competence and resource accessibility-remained significant, underscoring the need for ongoing adaptation in social case work practice.

Keywords: Evidence-Based Practice, Social Case Work, Psychosocial intervention, Homelessness.

Introduction

Social case work is a fundamental approach within social work that aims to help individuals adapt to their life situations, build up their ability to cope, and deal with problems. The main goal is to support clients in improving how they interact socially, while also encouraging their personal growth and adjustment to their surroundings. In 1915, Richmond is often credited with defining social case work scientifically as a method of helping people for their own and society's improvement, highlighting changes in personality and better social integration. Watson, in 1926, went against the psychosocial model and put more focus on ego psychology. Meanwhile, Taylor, also in 1926, stressed the importance of understanding a person's entire personality to foster healthy social functioning. Perlman, in 1957, pinpointed four core elements of social case work: person, place, problem, and process that still form the basis of modern practice. The

main goal of social case work is to help people understand and solve their problems, boost their self-esteem, fix or prevent issues that affect their well-being in society, and create more opportunities for better social integration.

A crucial part of making case work effective is the bond between the client and the social worker. This connection, first highlighted by Robinson in 1939, serves as a bridge that helps bring out the client's strengths. This relationship makes it easier to challenge problems, use available resources well, face real circumstances and feelings, and help the person nurture themselves.

According to Perlman (1957), the process of social case work involves understanding the nature and importance of the problems at hand, figuring out what roots them, looking at how the person is dealing with things, making clear what the desired results are, and checking what help the organization can offer in relation to the client.

When it comes to evidence-based case work models, one popular approach is Task-Centered Case Work (TCCW). This method highlights short, focused, and structured interventions. Essentially, the client and the social worker work together closely to understand specific problems, set clear, measurable goals, derive the solutions, and then monitor their progress all within a set time limit. The key here is emphasizing realistic perspectives, achievable steps, ensuring the client is actively involved, and constantly assessing progress (Reid & Epstein, 1972).

Research has actually shown that having this structured guidance when carrying out tasks helps people more consistently, accelerates social improvement, and enhances client well-being with the process (Reid, 1975). TCCW is especially beneficial for the client dealing with adjustment issues, financial or job-related challenges, and mental health concerns. It's boundless because it assists in addressing the challenges in a tangible way, improves problem-solving skills, and boosts a person's belief in their own abilities.

Strengths-Based Case Work is all about determining and nurturing the skills, resources, and inner strength a client already has, rather than focusing on what they might be lacking. It sees the client as a central figure in the process, strongly shaping the environment, teamwork in planning, and building resilience (Saleebey, 1996). Recent research has shown just how effective this approach can be. To illustrate, Gellen and Fox (2024) found that using strengths-based strategies helps improve long-term outcomes and maintain consistent performance. This whole model is about creating sustainable positive change by tapping into the client's natural abilities.

Problem-Solving Case Work is a methodical way of helping clients tackle their issues effectively. It integrates cognitive-behavioral methods to guide clients through identifying problems, brainstorming various solutions, weighing their choices, developing plans, and assessing the outcomes (Perlman, 1957). There's solid proof that this approach is highly effective to improve client results; To demonstrate, Areán and colleagues (2010) discovered that problem-solving therapy notably reduces emotional distress, especially in older adults. This model is especially convenient for clients struggling with mental health

issues, difficult decisions, or relationship problems. It encourages a sensible, team-based, and solutions-oriented approach to intervention, which leads to enhanced decision-making skills, coping abilities, and self-assurance.

Crisis Intervention Case Work comes to light when clients are going through intense, short-term crises like trauma, unexpected loss, or domestic violence. The main goals are to assess the situation promptly, evaluate potential risks, provide emotional support, and engage the client with long-term services (Caplan, 1961; Roberts, 2000). Recent studies, such as those by Okonkwo (2025) and Kashyap and Kashyap (2024), really highlight how crucial social workers are in assessing needs, advocating for clients, and mobilizing resources to help them get back on stable ground. This type of intervention is vital for ensuring immediate safety, helping clients emotionally stabilize, connecting them with ongoing support systems, and reducing the risk of distress.

Case Management is entirely about coordinating different steps like assessment, planning, carrying out services, monitoring the progress, and evaluating the impact of those services to meet clients' complex needs. It's designed to provide comprehensive support by bringing together various services, especially for clients dealing with mental health challenges, chronic illnesses, or complicated social circumstances (Weil & Karls, 1985). Observing how social workers responded during natural disasters (2022), we see evidence that case management helps improve the coordination of services, although there's still room for improvement when it comes to psychosocial training. Overall, this model makes it easier for clients to utilize the support available, minimizes the services, and promotes their overall well-being.

Eclectic or Integrative Case Work which is a more adaptable approach. Social workers using this method draw from a mix of theories and techniques, like behavioral, narrative, systems, and strengths-based approaches to customize interventions specifically for each client's situation (Goldstein, 1990). Evidence points to the benefits of combination strategies such as Motivational Interviewing and the Three Conversations, suggesting these can boost empowerment, foster collaboration, and help clients achieve their goals (Caiels et al., 2024). This flexible strategy allows for interventions that are tailored to the individual and their context, making social work practice much more effective for clients facing complex, multi-layered issues.

A Systemic Intersection

Brief Clinical History

Ms. V is a 30-year-old woman who has been living with schizophrenia for 10 years. She came to the Mental Health Institute on January 13th, 2025. The client presented with complaints of hearing voices, fear of being persecuted, paranoia, and poor appetite. The client appears to have no formal education and a lack of social support from her family, and there was alleged physical abuse, neglect from the family, which led her to stay in rehab centers.

Over the course of the period, she came for the routine follow-up at the mental health institute on October 8th,2025. She absconded from the outpatient department premises and later returned safely. Considering her safety and poor judgment, it was decided that she requires inpatient care and further management.

Clinical Diagnosis: Schizophrenia

Psycho-social stressors

Individual Factors	Family Factors	Community Factors	Gender-Related Vulnerabilities
• Psychiatric illness • Self-stigma • Functional impairment • No formal education • Unemployment • Neglect / Institutionalization / Isolation / Abandonmen	• Limited understanding of illness • Poor social support • Single-parent family structure • Social exclusion • Caregiver burden	• Community drift • Enacted stigma • Lack of community-based support • Inadequate mental health resources	• Unmarried status • History of wandering/homelessness • Physical abuse • Neglect / Rejection by family

This table represents the contributing factors that affect individuals with mental illness, especially in the case of severe mental illness. Mental health difficulties can cause impairment in biological, psychological, and social functioning, which are determinants of financial challenges, starting in the family, lack of support from the family, social stigma, and which often lead to the individuals being isolated or even becoming homeless. When there's inadequate primary, secondary, and tertiary social support or a lack of resources, these individuals can feel even more pushed to the edges of society.

Psycho-social Remedies

A team of psychiatric social workers, working closely with the multidisciplinary team, including psychiatrist, clinical psychologist, and psychiatric nurses treating her, planned and put into action a thorough psychosocial support plan that was made objective for Ms. V's condition.

1. Supportive Psychotherapy

In the initial stage of the beginning of psycho-therapy, the focus was on establishing a therapeutic environment where Ms. V could freely express her emotions. She was encouraged to express her concerns, and her feelings were given thoughtful consideration. The therapist gave her reassurance about reconnecting with her family, looking into suitable living arrangements, and continuing with her treatment.

2. Psychoeducation

Ms. V has poor knowledge, attitude practice about her illness. To assist her, a Psycho-educative session was conducted for Ms. V. During this session, causes of illness, symptoms of illness, common myths and misconceptions about the illness, importance of medication adherence, regular follow-up up and relapse prevention were discussed.

3. Family Tracing and Legal Aid Support
Several attempts were made to trace the family of the client with the help of local police, the Human Rights Commission, and the Legal Aid Clinic to integrate the client with the family, but efforts were not achieving the primary goal of integrating the client into the family

4. Grief Counselling
Grief counselling is provided to the client to support them emotionally and help to manage the unresolved emotions that can cause significant emotional vulnerability due to the death of loved ones. The session started with the grief assessment. Assessment shows that the client is at the phase of acceptance stage of grief. The therapist created a safe and supportive environment to the client can express her feelings and thoughts without fear of judgment. The therapist used narrative therapy to help the individual process her grief, which involves helping the client create a narrative or story about the grief that can help her find meaning and purpose in their loss. The therapist may also provide practical guidance and support, such as helping the individual with self-care, setting goals, and developing coping strategies.

5. Financial Assistance
With the benefit of the Poor Fund, dermatology referral was supported, and a three-month supply of free psychiatric medication was facilitated

Rehabilitation and Placement
On May 26th, 2025, Ms.V was rehabilitated at the Charitable Trust in Hosur, Tamil Nadu. It is a non-profit registered organization that predominantly works for women's welfare. The organization serves a shelter home, education, and skill-building programme for women. Ms. V was placed in the organization to develop skills, ensure care, promote safety, and facilitate long-term management. After the placement, Ms. V was able to engage in the daily activities and instrumental activities of daily living in the NGO. However, she expressed that she didn't interact much with other inmates primarily because she had difficulty communicating due to language barriers. During the telephone follow-up sessions, she brought up similar matters, finding it hard to adjust to the new environment and feeling unsatisfied due to communication difficulties.

On 8th October 2025, when she came up for the regular follow-up at the outpatient department with the attendant of the trust, she absconded from the hospital premises but later returned on her own after a few hours. Considering her mental state and safety, she was admitted to the Short Stay Ward and subsequently to Pavilion 3 under Section 86 of the Mental Healthcare Act, as per the Medical Superintendent's instruction.

Preparation of Rehabilitation
The multidisciplinary team planned to reintegrate the client and identified a home for the aged trust in Bengaluru. The psychiatric social work team made a field visit to the organization to explore the rehabilitation facilities, followed by discussions with the client and the treating team. In view of previous challenges faced by the client related to language difficulties and cultural barriers at the former NGO, it was decided to plan a subsequent visit with the patient to further evaluate her competence within the new setting.

Challenges and Barriers for Successful Rehabilitation

- Communication difficulties limit social interaction.
- Lack of belonging, emotional distress, frustration, and social withdrawal in response to communication barriers.
- Difficulty in adjusting to new settings and unfamiliar caregivers
- Need for close supervision due to fluctuating mental state
- Poor insight and impaired adaptive functioning
- Lack of family interaction and rejection from the family

Conclusion

This case study shows how structured, culturally aware psychosocial interventions can help someone regain their sense of identity, purpose, and commitment to treatment. As the person became more involved in decisions about their care, it was clear they were gaining insight, independence, and motivation. The teamwork of the multidisciplinary team, using proven casework methods, led to better emotional stability and preparedness for rehabilitation. Ultimately, this case underscores how vital it is to have personalized, community-based mental health services to help people with complex psychosocial needs achieve lasting recovery.

Limitations

- The study's participants might not reflect the broader population.
- The snapshot-like design makes it hard to prove cause and effect.
- Different psychosocial stressors can overlap, making it complicated to classify them clearly.
- Key factors like socioeconomic status or other health issues might not have been fully accounted for.
- Without long-term follow-up, it's tough to understand in what way effects might have changed over time.

Acknowledgements

We want to thank the institute for its wonderful support and encouragement, which really helped us carry out the interventions.

Declaration of conflicting interests

The authors confirm that there are no conflicts of interest related to the research, writing, or publication of this article.

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South Asian Journal of Participative Development
Vol.25, No.2 (Spl.), July - Dec. 2025
ISSN No: 0976-2701

Evidence-Based Group Work Approaches to Prevent Substance Abuse among Youth in the Context of Viksit Bharat

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Abstract

Substance abuse among teenagers is a major public health concern in India, especially with the country moving toward the vision of Viksit Bharat (Developed India) by 2047. This review synthesises evidence-based group work strategies for preventing substance abuse among Indian adolescents, bringing international research to the forefront and tying it with Indian settings. A systematic review of literature was used to analyse evidence-based group work methods for preventing substance abuse in youth, based on Viksit Bharat, through the PRISMA methodology. The article discusses different strategies of group interventions, ranging from cognitive-behavioural to life skills training, peer-to-peer interventions, and family-centred group programmes. It critically examines the efficacy of such approaches in light of cultural, socioeconomic, and contextual considerations specific to India. The review underscores the necessity of culturally tailored, community-oriented group interventions aligned with India's developmental priorities. Suggestions for policy, practice, and research are made with a view to enhancing substance abuse prevention among youth in the context of nation-building.

Keywords: Prevention of Substance Abuse, Youth, Group Intervention, Evidence-Based Practice, Viksit Bharat

Introduction

India is at a crossroads in its development journey, with the vision of Viksit Bharat seeking to turn the country into a developed nation by 2047. At the heart of this vision is the empowerment and welfare of its youth population, which makes up about 27% of the overall population (Ministry of Youth Affairs & Sports, 2019). Nonetheless, the growing rate of substance abuse among Indian children threatens to cause tremendous damage to individual growth and national development. The Magnitude of Substance Use in India survey indicates that about 2.06% of people aged between 10 & 17 years and 5.7% aged between 18 and 75 years consume alcohol, with a prevalence of cannabis use reaching about 2.8% of the population (Ministry of Social Justice & Empowerment, 2019).

Adolescent and young adult substance use not only is detrimental to physical and mental

health but also affects educational achievements, vocational progress, and social competence (Degenhardt et al., 2016). The effects spill over beyond the individual harm to impact families, communities, and the healthcare system, thus detracting from the human capital basis for national development. Within Viksit Bharat, responding to youth substance abuse means evidence-based, scalable interventions that can be efficiently delivered across India's cultural and socioeconomic diversity.

Group methods have proved to be especially promising methods of preventing substance abuse among adolescents with the benefits of peer support, cost-effectiveness, and reach (Sussman et al., 2004). Group methods draw on the energy of the group to promote skill acquisition, social support, and positive behaviour change. This review consolidates recent evidence regarding group work methods for substance abuse prevention among youth, focusing on their applicability and adaptation within the Indian context in terms of Viksit Bharat goals.

Methods and Materials

Research Design

In the current study, a systematic review of literature was used to analyse evidence-based group work methods for preventing substance abuse in youth based on Viksit Bharat through the PRISMA methodology. The review had three objectives:

1. To synthesise and identify evidence-based group working methods for substance abuse prevention among Indian youth.
2. To analyse different group intervention methods' theoretical bases and effectiveness.
3. To evaluate the Indian context-specific requirements of cultural adaptation and challenges of implementation

Search Strategy

A comprehensive literature search was done in multiple electronic databases, such as Medline (PubMed), Science Direct, Google Scholar, Cochrane Library, PsycInfo, and Web of Science.

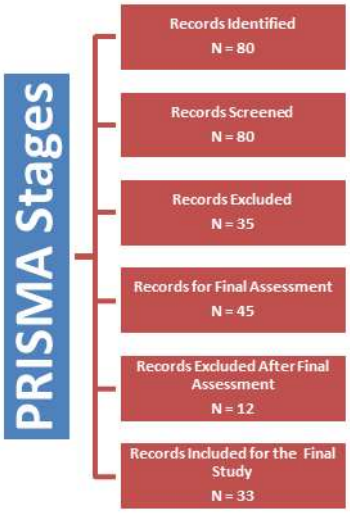
Search terms included

Search terms were "Evidence-based group work", "Youth substance abuse prevention", "Group interventions substance abuse", "Cognitive-behavioural group therapy", "Life skills training", "Peer-led prevention programmes", "Family-based group interventions", "India substance abuse prevention", "Cultural adaptation prevention programmes", and "Viksit Bharat youth development". The literature review was carried out over six months, encompassing publications mainly between 2004 and 2024, with a specific focus on recent evidence between 2015 and 2024.

Inclusion Criteria and Exclusion Criteria

The inclusion criteria employed for the selection of studies for review were as follows: full-text peer-reviewed articles and reports in English language; group-based prevention intervention studies for alcohol and drug abuse in adolescents and young adults; evidence-based studies on interventions, systematic reviews, meta-analyses, and theoretical models; studies with implications in Indian cultural settings or with potential for cultural

adaptation; and articles from the last two decades to reflect current evidence. The exclusion factors were studies that were only treatment and not prevention, non-group (individual) intervention strategies, studies written in languages other than English, unpublished conference abstracts and dissertations with no complete methodology, and studies with inadequate methodological detail. Around 80 papers were initially identified, and after screening and assessment of quality, 33 full-text articles and reports were identified for systematic review and synthesis.



Theoretical Models Informing Group Work Strategies

Social Learning Theory

Social Learning Theory, established by Bandura (1977), is based on the idea that people acquire behaviours by observing, imitating, and modelling. In the case of prevention of substance abuse, according to this theory, the behaviours of peers, family habits, and media images of substance use affect adolescents. Group-based interventions drawn from this theory employ positive peer modelling, role-playing, and observational learning to enhance refusal skills and encourage healthy alternatives to substance use (Botvin& Griffin, 2004). In Indian settings, where collectivistic values stress group harmony and social conformity, Social Learning Theory offers a culturally relevant model for prevention.

Cognitive-Behavioral Theory

Cognitive-Behavioural Theory places a focus on the interaction among thoughts, emotions, and actions, postulating that dysfunctional cognitions play a role in substance use (Beck et al., 1993). Cognitive-behavioural interventions in groups target identification and alteration of risk-related thinking styles, acquisition of coping skills, and building self-efficacy. These methods educate adolescents to identify triggers, de-catastrophize about substance use, and rehearse substitute responses through group discussion and task completion (Waldron & Turner, 2008).

Ecological Systems Theory

Bronfenbrenner's (1979) Ecological Systems Theory acknowledges that adolescent development takes place within several interconnected environmental settings such as family, peer groups, schools, and community. This model is most relevant to Viksit Bharat, since it acknowledges the need to address substance abuse prevention at various levels. Group work models based on ecological theory usually involve family members, educators, and community members in the program, understanding that prevention in the long term needs systemic change (Kumpfer et al., 2002).

Empowerment Theory

Empowerment Theory places a focus on developing individual and collective capacity to define problems and access resources for change (Zimmerman, 2000). Working with youth in groups, this strategy is concerned with enhancing critical consciousness, leadership, and community involvement. Empowerment-based prevention groups empower youth to examine risk factors in their worlds, speak out on behalf of protective resources, and act as change agents in their communities, a highly relevant strategy for activating India's youth in nation-building initiatives.

Evidence-Based Group Work Strategies

Life Skills Training Initiatives

Life Skills Training (LST) programs are one of the most widely researched methods of substance abuse prevention. Conceived by Botvin and others, LST utilizes a full-length group-based curriculum to instruct personal self-management skills, social skills, and substance resistance skills (Botvin et al., 1995). Meta-analyses have shown that LST programs lower tobacco, alcohol, and marijuana use among teens significantly and effects persisted into early adulthood (Botvin& Griffin, 2004).

LST programs usually consist of 12-15 interactive group sessions conducted by trained facilitators. Essential elements are problem-solving and decision-making skills, anxiety management strategies, communication skills, and assertiveness training. The group structure allows for peer learning, skill practice via role-plays, and the formation of supporting peer networks (Griffin & Botvin, 2010). Diverse international studies have revealed that LST remains effective when culturally adapted, suggesting potential for use in India (Botvin et al., 2006).

In the Indian context, there have been numerous modifications of life skills programs. The World Health Organization’s life skills education program has been implemented in school curricula in different Indian states, with evidence of enhanced knowledge, attitudes, and self-efficacy pertaining to substance use (Srikala & Kishore, 2010). Implementation fidelity challenges, teacher training, and sustainability continue to pose substantial concerns that need to be addressed for scaling up within the Viksit Bharat framework.

Cognitive-Behavioural Group Therapy

Cognitive-Behavioural Therapy (CBT) modified for group work has significant evidence for preventing and treating substance use disorder among adolescents and young adults. Group CBT interventions target the identification of high-risk situations, refusal skills,

challenging pro-substance use cognition, and coping with stress and negative emotions (Waldron & Turner, 2008). The group allows vicarious learning, feedback from peers, and normalizing discussion of problems.

Systematic review by Hogue and others (2018) revealed that CBT-informed group treatments evidenced moderate to large effects in decreasing substance use in adolescents, with similar effectiveness as individual treatment but lower cost. Group CBT normally consists of 8-16 formal sessions with psychoeducation, cognitive restructuring activities, behavioural skill development, and relapse prevention practices.

Peer-Led Prevention Programs

Peer-led interventions take advantage of peers' strong influence in adolescence and young adulthood. The interventions provide training for selected young people as peer educators or facilitators who, in turn, present prevention messages and activities to their peer group (Black et al., 1998). The peer-led intervention strengthens message credibility, enhances participation, and induces diffusion of healthy norms across youth networks.

Evidence regarding peer-led programs is conflicting but overall favourable. A Cochrane review by MacArthur and others (2016) identified that peer-led interventions lowered initiation of smoking, alcohol, and marijuana use in comparison to no intervention, although the effects were small. The success of peer-led programs seems to be contingent on rigorous selection and training of peer leaders, provision of follow-up support and supervision, and integration into comprehensive prevention strategies.

India has an established tradition of peer education based on programs for HIV prevention and reproductive health, with infrastructure that potentially could be utilized for the prevention of substance abuse. The National Service Scheme and other youth organizations provide settings through which peer-led prevention groups might be implemented. Yet studies focused on peer-led substance abuse prevention specifically in India are still scarce, and research on this topic is a key area for future research.

Family-Based Group Interventions

Understanding the family to be the key context for youth development, a number of evidence-based prevention programs utilize family-centred group formats. Programs like the Strengthening Families Program (SFP) involve parents and youth in simultaneous and concurrent group sessions to enhance family relationships, parenting skills, and youth competencies (Kumpfer et al., 2002). Meta-analytic findings prove that prevention programs that target families elicit greater and more long-term effects than interventions targeting youth alone (Foxcroft & Tsertsvadze, 2011).

The SFP model usually consists of 7-14 weekly sessions with individual parent and youth groups and subsequent family practice sessions. Parent groups emphasise effective discipline, supervision and monitoring, communication, and substance-specific information. Youth groups deal with life skills, resistance skills, and prosocial activities. Family sessions give chances to practice new interaction patterns and consolidate family relationships (Spoth et al., 2008).

Family-based group interventions need to be adapted in India by taking into account the family forms, norms of parenting, and intergenerational relationships. Although joint family systems still prevail, urbanization and migration have resulted in a growing proportion of nuclear family structures. Pilot trials of family skills training in India have been found feasible and acceptable, with the participants evidencing enhanced family communication and youth behaviour. Yet, parental attendance issues, father involvement, and scheduling necessitate innovative answers, including community-based provision and flexible timing.

Motivational Enhancement Group Therapy

Motivational Enhancement Therapy (MET) that has been modified for group purposes utilises motivational interviewing principles to strengthen intrinsic motivation to change behaviour. Group MET interventions provide a non-confrontive setting in which youth are able to examine ambivalence about alcohol and substance use, express personal values and goals, and formulate commitment to change. The group setting enables users to learn from different points of view about change, witness the change process of others, and give each other support (Shetty, K. V et., 2022).

Studies show that short motivational group interventions can significantly lower substance use among adolescents, especially when incorporated with other techniques like cognitive-behavioural skills training (Jensen et al., 2011). Group MET is especially useful for reaching resistant or ambivalent youth who would respond negatively to more directive methods. The focus on autonomy and self-choice is consistent with adolescent needs for independence (Srivastava, P., & Shetty, K. V. 2024).

In India, where direct conflict can be at odds with cultural norms of communication that value respect for elders and harmony, motivational strategies that respect individual autonomy yet sustain relational sensitivity can be especially salient. There is a need for research to investigate the cultural adaptation of motivational interviewing principles and group MET strategies among Indian youth populations.

Mindfulness-Based Group Interventions

There is emerging research supporting the integration of mindfulness activities within substance abuse prevention programs. Mindfulness interventions introduce present-moment awareness, experiential acceptance without judgment, and mindful responding rather than habitual reacting (Bowen & Marlatt, 2009). Youth-based mindfulness group programs commonly involve meditation exercises, mindful movement, and exercises in applying mindfulness to triggers and cravings for substance use.

A meta-analysis by Li et al. (2017) concluded that mindfulness-based interventions significantly lowered alcohol and substance use in adolescents and young adults. The processes appear to include better emotion regulation, less impulsivity, greater self-awareness, and less stress reactivity. Group delivery of mindfulness training allows for mutual practice, normalization of difficulties, and support by peers for ongoing practice.
Mindfulness-based approaches could be especially promising for India, as there is cultural affinity with meditation and contemplative practices based on yoga and spiritual traditions. The Brahmakumaris' life skills training involving meditation has been

introduced in Indian schools with good effects. However, it is important to differentiate secular, evidence-based mindfulness interventions from religious or spiritual instruction to establish suitability for heterogeneous populations.

Community-Based Group Programs

Community-based prevention programs involve youth in organised group activities and service projects in their own neighborhoods. These programs commonly include recreation, mentoring, skill building, and community service elements that are intended to foster protective factors such as social bonding, prosocial involvement, and attachment to community (Hawkins et al., 2009). Examples of such programs are after-school clubs, youth leadership programs, and community service organisations.

There is evidence that highly structured community-based programs can lower the risk of substance use by offering structured time, positive adult connections, and potential for skill acquisition and affirmation (Feinberg et al., 2007). The Communities That Care prevention system, which organises community members to put in place evidence-based prevention programs, has been shown to lower substance use in a variety of communities (Hawkins et al., 2009).

India's robust social tradition of community organisation in panchayats, self-help groups, and voluntary organisations offers a base for community-oriented prevention strategies. Youth clubs, Nehru Yuva Kendras, and National Service Scheme units provide potential infrastructure for substance abuse prevention groups. Incorporating evidence-based prevention material in these platforms at the community level may increase reach and sustainability while harmonising with grassroots development goals at the heart of Viksit Bharat.

Cultural Adaptation and Contextualization for India

Successful application of evidence-based group work methods in India necessitates careful cultural adaptation without sacrificing fidelity to the essential intervention components. A number of frameworks inform cultural adaptation procedures, such as the surface-deep framework (Resnicow et al., 2000) that contrasts surface-level changes (e.g., language, images, materials) with deep-structure adaptations that involve cultural values, beliefs, and social environments.

Language and Communication Styles

India's linguistic diversity necessitates the translation and adaptation of intervention materials into multiple languages. Beyond literal translation, adaptation must attend to communication norms, including indirect communication styles, respect for hierarchy, and emphasis on harmony. Group facilitation approaches should be modified to align with culturally appropriate interaction patterns, such as incorporating storytelling, using culturally relevant examples, and adjusting confrontation levels (Sharma, 2014).

Family and Community Integration

The collectivistic nature of Indian culture, with its focus on interdependence and family obligation, demands more involvement of family and community in prevention than is the case with Western individualistic culture (Chadda & Deb, 2013). Family members,

particularly parents and extended family, should be included in group interventions, honour family authority, and incorporate consideration of the effects of substance use on family reputation and honour. Community elders and leaders can be involved as intervention champions and point persons.

Traditional gender roles and issues related to co-educational activity in certain communities might require single-gender group structures, at least in the beginning. Single-gender group facilitators using female facilitators for girls' groups and considerations for safety, privacy, and family acceptance are required. Topics should include gender-specific risk and protective factors, such as the lower incidence but rising prevalence of substance use in Indian girls and young women (Ministry of Social Justice and Empowerment, 2019).

Socioeconomic Diversity
India's wide socioeconomic differences influence patterns of substance use, risk factors, and access to intervention. Group methods need to be modified for various settings such as elite urban schools, government schools in disadvantaged areas, rural settings, and out-of-school youth. Low-cost or free programs, community-based service delivery, and linkage to available services can increase access among economically disadvantaged groups.

Religious and Spiritual Integration
Without loss of secular validity, interventions may graciously include religious and spiritual components when relevant and welcomed by participants. Allusions to values prioritised throughout Indian spiritual traditions, e.g., self-control, service to others, and honour for one's body, can enhance motivation for abstention from substance use. Caution is necessary, however, to avoid exclusion across India's spiritual diversity.

Informal School-Based Implementation
Schools offer key access points for the majority of youth, making group prevention programs offered through schools a high-priority approach. Implementation of evidence-based prevention curricula within the school system involves coordination with education authorities, teacher training, and instructional time allocation. The National Education Policy 2020's focus on holistic education and well-being offers possibilities for systematic integration of substance abuse prevention within the curriculum framework (Ministry of Human Resource Development, 2020).

Challenges are high student-to-teacher ratios, testing pressures, limited preparation of teachers in interactive pedagogies, and a lack of resources. Solutions could include training specialist counsellors or social workers to implement group prevention programs, using peer educators, and creating effective, manualized curricula that can be implemented with fidelity even in resource-poor environments.

Community and Primary Healthcare Integration
With low school enrollment rates among certain groups and the necessity of reaching larger populations, substance abuse prevention groups need to be brought into community health centres, anganwadis, and primary healthcare networks. ASHA workers and

community health workers might be trained to lead prevention groups among out-of-school children and high-risk groups. This fits with the Ayushman Bharat mission's focus on holistic primary healthcare (Ministry of Health and Family Welfare, 2018).

Technology-Enhanced Group Interventions

Digital technologies present possibilities for expanding the reach and increasing the effectiveness of group interventions. Blended models that pair face-to-face group sessions with mobile applications, online platforms, or text messaging have the potential to offer sustained support, practice opportunities for skills, and between-session monitoring. With India's extensive mobile phone coverage and increasing internet access, technology-enhanced group interventions merit consideration, with an eye to digital literacy and access inequalities (Arora et al., 2014).

Workforce Development

Effective implementation requires a trained workforce of group facilitators, including social workers, counsellors, teachers, and community workers. Social work education programs should incorporate evidence-based group work approaches for substance abuse prevention into their curricula. Continuing education, certification programs, and communities of practice can support skill development and quality assurance among practitioners. The National Action Plan for substance Demand Reduction by the Ministry of Social Justice and Empowerment offers a guideline for workforce development in this regard (Ministry of Social Justice and Empowerment, 2018).

Monitoring and Evaluation

Strong monitoring and evaluation mechanisms are needed to guarantee intervention quality, monitor outcomes, and allow continuous improvement. Common outcome measures tailored for the Indian setting should be used across the programs to allow comparison and meta-analysis. Integration of prevention programs with health information systems can help leverage data collection and utilisation for program improvement and policy-making.

Challenges and Challenges in Implementing Evidence-Based Group Work

Evidence-based group work for substance abuse prevention on a large scale in India are confronted with a host of interrelated challenges that need to be tackled in an overall manner. Stigma is one of the greatest challenges, given that substance use continues to be extremely stigmatised in Indian society, with a climate where young people and families can feel embarrassed or fear being judged when using prevention services. This stigmatisation is reinforced by chronic low awareness of the essential character of addiction as a valid health condition rather than as a moral deficiency, which in turn not only perpetuates negative attitudes but also underlies delayed help-seeking and resistance to participation in preventive interventions. In addition to attitudinal constraints, limited resources pose significant practical impediments to program implementation. Limited financial appropriations for prevention programs, limited numbers of trained staff who are able to provide evidence-based interventions, and competing demand against already heavily stretched education and health systems all limit the establishment and continuation of whole-systems prevention programs. These budget constraints require the formulation of affordable models and strategic linkage to established services in order to achieve maximum coverage and impact within achievable budgetary levels.

The evidence base itself is an important challenge in that although international research is strong support for numerous group work strategies, research within specifically Indian contexts is still surprisingly limited. This lack of research hinders the ability to confidently say what will work most effectively with Indian populations and how programs should be modified to fit local cultural environments, values, and social structures. More robust evaluation studies in Indian contexts are needed to determine effectiveness, pinpoint required cultural adaptations, and inform evidence-informed decisions on implementation. Policy and coordination issues further complicate prevention work because substance abuse prevention necessarily crosses several sectors, such as education, health, youth affairs, and social welfare, each of which has different mandates, priorities, and organisational arrangements. Without aligned policy models and cooperative implementation systems, prevention efforts are disjointed, constraining effectiveness and efficiency while producing gaps and redundancies in service delivery.

Last, intricate sociocultural processes condition the environment under which prevention programs are required to function. Dynamic and intricate contexts impacting youth patterns and risk of substance use have been created through accelerating urbanisation, rapid social change, and rising exposure to globalised cultural influences. Conventional protective factors that have traditionally insulated youth against substance use, such as a joint family system that ensured natural care and supervision, and stricter community control that promoted strong prosocial norms, are likely to be eroding in most settings, especially in urban and semi-urban centres. At the same time, new risk factors are arising, such as enhanced peer influence in less structured settings, exposure to substanceuse through media and social networks, and the pressures of educational pressure and insecure work futures. These changing sociocultural forces necessitate prevention strategies that are not merely evidence-based but also adaptive and attuned to the shifting circumstances of the lives of young people in contemporary India.

Recommendations

Successful development of substance abuse prevention strategies in India necessitates collaborative effort across policy, practice, and research arenas. At the policy level, it is necessary to mainstream evidence-based substance abuse prevention into national programs aligned with the Viksit Bharat vision so that prevention integrates as an integral part of education, health, and youth development programs. This integration should be underpinned by committed funding mechanisms that give evidence-based group methods priority in reaching diverse populations throughout India's diverse geographic and cultural terrain. Having national standards and quality assurance mechanisms in place will guarantee that prevention programs remain effective and safe when rolled out at scale. The key to success is fostering inter-sectoral collaboration through committed platforms that engage education, health, youth affairs, and social welfare department stakeholders to develop integrated prevention ecosystems. Furthermore, long-term investment in research and evaluation is critical for developing a strong evidence base for culturally tailored interventions and for understanding implementation approaches that function well in Indian settings.

For direct practitioners who work with youth, evidence-based models of group work are a cornerstone movement toward best practice. Models like Life Skills Training, cognitive-behavioural therapy-based groups, and family-based programs should be practised with fidelity to their essential elements and permit attentive cultural adaptation that is respectful of local values and social norms. The effectiveness of such programs relies, to a great extent, upon thorough training for group facilitators that not only confers technical competence in evidence-based methods but also involves skills in group process, cultural competence, and adolescent development. Effective implementation involves deliberate focus on process and outcome indicators that allow for ongoing improvement through constant monitoring and evaluation. It is essential to recognise young people as partners, not as passive recipients, of social programs and services; their ideas and leadership should be formally integrated into program design and implementation to increase relevance and participation. Lastly, forming sound partnerships between sectors and organisations provides the integrated prevention systems required to tackle the various levels of influence on youth alcohol use, from individual and family processes to peer networks and community settings.

The research agenda has to emphasise producing context-sensitive evidence that can inform effective prevention in India. Strong evaluation studies incorporating experimental and quasi-experimental designs must be conducted to analyse how evidence-based group work models function if implemented for Indian settings, going beyond the mere importation of Western models to figure out what, for whom, and under what conditions it works. Examining the change mechanisms and intervention mediators will sharpen theoretical insight and enhance program design by explaining how and why interventions work. Implementation research is also essential, evaluating the adaptability, acceptability, sustainability, and scalability of prevention programs across India's diverse settings, ranging from urban schools to rural villages. This task necessitates the creation and cross-cultural validation of measurement instruments that can help measure substance use protective and risk factors, intervention processes, and outcomes effectively within culturally meaningful Indian contexts. Lastly, investigators need to investigate novel strategies that tap into India's technological potential and community assets, such as technology-facilitated interventions, peer-based models, and community-based participatory methods that involve communities as partners in developing prevention solutions that are specifically sensitive to their needs and contexts.

Conclusion

Substance abuse prevention among youth is a crucial prerequisite for achieving the vision of Viksit Bharat, which relies primarily on the health, productivity, and well-being of the future generation. Evidence-based group work strategies present some of the most promising ways to develop protective factors, decrease risk behaviours, and promote positive youth development. Global research confirms the success of several group intervention models such as life skills training, cognitive-behavioural groups, peer-led programs, family-based interventions, and community approaches.

For these strategies to have an impact in India, careful cultural adaptation is necessary, addressing linguistic diversity, family forms, gender issues, socioeconomic differences, and cultural values. Implementation needs integration within school, community, and healthcare systems, facilitated by trained staff, appropriate resources, and supportive

policies. Though stigma-related challenges, resource considerations, and gaps in research need to be met, the potential is great.

The path to Viksit Bharat is not just economic progress but the overall growth of India's citizenry. In targeting evidence-based prevention strategies that equip youth with skills, strength, and prospects for healthy growth, India has the potential to lighten the burden of substance abuse while building the human capital necessary for long-term national advancement. Policymakers, practitioners, researchers, communities, and youth themselves will need to work together to take evidence to action and vision to fruition.

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South Asian Journal of Participative Development
Vol.25, No.2 (Spl.), July - Dec. 2025
ISSN No: 0976-2701

A Multi-Module Training Intervention to Equip Postgraduate Social Work Students for Social Work Camp

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Abstract

Social Work Education equips social work trainees with knowledge and skills essential for different levels of interventions. Learning by doing is the foundations of social work curriculum wherein field work training in general and social work camp in particular provides an opportunity to build professional skills for effective community engagement to practice community organization method. The conventional mode of fieldwork training lacks in providing individual and independent learning opportunities. Consequently, it is difficult to develop the knowledge, skills, aptitude and value orientation and professionalism among students. This has something to do with the mismatch between the knowledge and skills required in the field of community development and the knowledge and skills possessed by professional social workers. In this context, the paper attempts to examine whether the multi-module training interventions equip social work postgraduate students for social work camp participation and examine the skills enhancement in six different domains. It is found that there has been significant development in professional skills among postgraduate social work students in the domains of personal skills, interpersonal skills, leadership skills, learning skills, presentation skills and research skills. The paper advocates adopting multi-module training interventions to equip social work post graduate students with regard to prepare them for active community engagement in social work camp and by develop professional skills to become competent social work professionals in the field of community development.

Key Words: Social Work Education, Community Organisation, Social Work Camp, Multi-module Training Programmes, Interventions, Professional Skills.

Introduction

Learning by doing is core of social work education. The purpose of social work is to bring desirable change with required interventions. Social workers do not stop after studying a phenomenon, but do something about it even after studies (Fortune and Proctor, 2001; 67). Allen and Others (2008) reveal that the future of social work practice will stress on methods of working with people facing complex challenges. In most of the cases, social workers are to involve in community-based practice. Social work educators need to focus on the curricular areas like developing student knowledge, skills, and values. Dealing with community requires adequate competencies to tackle strategically with community dynamics. Knowledge, skills and competencies become relevant in seeking positive participation of communities, address community development issues and enable communities towards holistic and sustainable development (Cooper & Kogut; 1993; Howard and others, 2015; and Sonar, 2018).

Planning, preparation and organization is the core of any experiential learning programme. Training programmes have greater significance in enhancing quality learning especially in social work education. Participatory learning play a vital role in skill based trainings. According to an assumption 'active' is largely successful in education when compared to 'passive'. Students with participative activities learn better than the students who do not participate (Peter, 2013). According to Eleanor and Margaret (2016) participatory learning provides an opportunity to engage both the struggling as well as high achieving students. Higher achievers learn to be more creative where as struggling students flourish when they are able to apply knowledge in practical settings. In this process of learning, professionalism excels in terms of practicing the profession over acquiring essential skills, knowledge base and techniques to meet the challenges of complex society. The primary goal of social work education is to prepare social work students to practice the profession. In the due course of social work education, students were provided with the opportunity to acquire necessary knowledge, skills, and methods of intervention, ethical values, and standards for professional practice (Maclntyre, Gillian, and Sally Paul, 2013; and Sonar, 2018).

The only component of field work to practice community organization is majorly Social Work Camp. It is an opportunity for the social work students to practice community organization method. Practicing theory is a method of social study, but it is also hardcore of any professional course (Sonar, 2018). It is, better than other methods of study as practice is consciously undertaken in the domain of social sciences like social work. In ethnographical and sociological studies, it helps to perceive and predict social roles, both one's own and those of other stake holders (Hughes, 1971). Social work camp is the hardcore components of social work education that expose community life to pupils of social work for community engagement. Living in the community makes them to experience the experiences of community members. In view of this the study was conducted with the following objectives;

1. To develop multi-module training and make interventions with postgraduate social work students for effective community engagement; and
2. To evaluate the impact of multi-module training on postgraduate social work students in developing professional skills.

Methodology

To achieve objectives of the study, it was adopted experimental (pre-post) research design. The entire postgraduate social work students (56) who were to take part in social work camp were considered as intervention group. An assessment of domain skills among students was made before interventions. Planning and preparation was started about 45 days before organization of camp. Further, social work camp was organized in a tribal community for duration of 8 days. Altogether 16 days duration was spent in making multi-module training with different intervals. It was 13 training modules (7 during planning and preparation phase and 6 during organization of camp in the community). It was developed by researcher in consultation with experts, field practitioners and literature. Further, experiences gained from previous social work camps were also major source in this regard. 13 training programmes were organized in different phases to enhance skills among students for community engagement (see tabke-1).

A five-point Likert scale was used to assess professional skills with regard to personal skills, interpersonal skills, leadership skills, learning skills, presentation skills and research skills. After the camp, it was further assessed the same skills to see the change. Five faculty members were in every day conversation with students allotted to them to collect data. The primary data pertaining to different skills were gathered by observing, informal interviews, focused group discussions and during presentations and involvement by students as a technique of data collection. The data collected was subjected to processing. It was keyed into the computer in the software of SPSS to get the Uni-variate and Bi-variabe tables. The proportions have been drawn for better analysis. Besides, select case studies are presented in complementary to quantitative data as evidences to showcase impact of interventions.

Table-1: Multi-module Training Interventions for Social Work Students

Training Module No.	Training Module Name	Phase of Intervention	Duration	Expected Outcome
1.	Micro Planning techniques	Pre-Camp	3 days	Participatory planning, participatory research
2.	Programme Management	Pre-Camp	½ day	Protocols of formal/awareness programmes
3.	Photography & writing for newspaper	Pre-Camp	½ day	Photography and writing press note
4.	Structured Experience Laboratory	Pre-Camp	2½ days	Understand power dynamics of community, and community engagement
5.	Interviewing and observation	Pre-Camp	½ day	Questioning, observing and recording
6.	Focus Group Discussions	Pre-Camp	½ day	Dealing with groups and collecting qualitative data
7.	Yoga and Pranayama	Pre-Camp	½ day	Self control and regulating anger/anxiety
8.	Household survey	During Camp	1 ½ day	Rapport building, Interviewing & Observation & primary data collection
9.	Construction of Soak Pit	During Camp	½ day	Cleanliness drive and Demonstration of soak pit
10.	Micro Planning activities	During Camp	4 days	Participatory appraisal of community on focused areas, identify felt needs and develop leadership skills
11.	Sharing on Micro Planning Exercises	During Camp	1 day	Presentation and conceptual clarity on Micro planning techniques and issues focused
12.	Visit to local institutions (Govt, CBOs and NGOs)	During Camp	½ day	Collect secondary data and understand functioning of local institutional mechanisms
13.	Data Processing and Consolidation of data	During Camp	½ day	Editing, coding, quantification, tabulation, calculation of percentage and analysis of data

Findings and Discussion

The demographic profile of the post-graduation social work students was explored. Out of 56, a majority of them more than three-fifth are males (62.5 percent); more than one-fourth have entered the course at the age of 24 years and above with a break in education (26.8); about seven-tenth of them hails from rural areas (69.6 percent); the same proportion belonging to nuclear families; more than three-fifth are from economically weaker sections (60.7 percent); more than four-fifth have studied in Kannada medium till post-graduation (83.9 percent); more than two-fifth are interested to work in the field of community development as their career after MSW programme (43.7 percent) and more than three-fifth are belonging to the category of Other Backward Caste (60.7 percent). It is clear from the empirical data that most of the students were from rural areas; studied in Kannada medium; belonging to nuclear families; and economically weaker sections.

Impact of Multi-module Training Interventions

An attempt has been made to evaluate the impact of multi-module training interventions made with post-graduate social work students. Impact on different skills viz., personal skills, interpersonal skills, leadership skills, learning skills, presentation skills and research skills was assessed. The pre-intervention assessment data was compared with the post intervention data in order to assess the impact.

Personal Skills

An attempt has been made to assess the impact of multi-module training interventions on the personal skills of postgraduate social work students. The personal skills focused among them were; having control over self; being good tempered; being friendly; management of time; and stress management. These skills have been significantly developed among the students in the process of multi-module training interventions adopted.

Out of 56 MSW students, a majority of them more than half were poor or very poor in self-control before camp. This proportion has been significantly reduced to more than three-tenth. On the other hand, this skill has been developed in a major proportion more than three-fifth, which was only more than one-fifth before camp. Further, a significant proportion more than three-tenth students were poor or very poor in being good tempered before camp. This proportion has been significantly reduced to nil. A better proportion less than half of the students were poor or very poor in time management before camp. This proportion has been significantly reduced to less than one-tenth. On the other hand, this skill has been developed in a major proportion less than three-fifth, which was more than two-fifth before camp. Further, a significant proportion more than two-fifth students were poor or very poor in stress management before camp. This proportion has been significantly reduced to less than one-tenth. On the other hand, this skill has been developed in a major proportion less than three-fifth, which was only more than two-fifth before camp. The personal life of the students is deeply influenced over group living, sharing and caring by its co-members in terms of hard working, honesty and commitment. Living in a group, caring each other and sharing common resources make them to develop such skills (see table-2). It is true in case of *Santosh (name changed) 26-year-old student who was aggressive, short tempered, hardly mingle with friends, and hardly maintains the time. Since he was made the leader of discipline committee, he had to handle difficult situations at different places during camp. Group living, handling situations, being accountable to maintain discipline made him to be emotionally stable, being good tempered, mingling with friends and follow time.*

Interpersonal Skills

An attempt has been made to assess the impact of multi-module training interventions on the interpersonal skills of the students. The interpersonal skills assessed among the students were; skills of verbal communication; non-verbal communication; listening skills; questioning skills; and working in groups. These skills have been significantly developed among the students.

Out of 56 MSW students, it is found that a major proportion more than three-fifth students were poor or very poor in verbal communication before camp. This proportion has been significantly reduced to less than one-tenth. On the other hand, this skill has been developed in a significant proportion more than three-tenth which was only more than one-tenth before camp. A major proportion more half of the students were poor or very poor in non-verbal communication before camp. This proportion has been significantly reduced to less than one-tenth. On the other hand, this skill has been developed in a significant proportion more than three-tenth, which was only less than one-tenth before camp. Further, good proportion less than two-fifth students were poor or very poor in

listening skills before camp. This proportion has been significantly reduced to less than one-tenth. On the other hand, this skill has been developed in a major proportion more than three-fifth, which was only more than one-tenth before camp. A major proportion less than seven-tenth students were poor or very poor in questioning skills before camp. This proportion has been significantly reduced to less than two-fifth. On the other hand, this skill has been developed by a significant proportion more than three-fifth, which was only (3.6 percent) before camp. Further, significant proportion less than two-fifth students were poor or very poor in working in groups before camp. This proportion has been significantly reduced to more than one-tenth. On the other hand, this skill has been developed in a major proportion more than three-fifth, which was less than one-fourth before camp. Working in committees and interacting with other committees, social games on communication barriers, questioning and answering enabled the students to have better verbal and non-verbal communication, and also develop active listening (see table-2). It is true in case of *Priya (name changed) who was poor in communication, used to be alone and hardly raise questions during interactions. She was to make series of presentations on the PRA activities done, sought group cooperation for conducting PRA technique assigned to her. At the end of camp, she has presented a report of the camp in valedictory programme with confidence. Now she comfortably mixes with the groups.*

Leadership Skills

An attempt has been made to explore the impact of multi-module training interventions on the leadership skills of students. The leadership skills studied among the students were; delegation skills; giving and receiving feedback; conducting meetings; emotional intelligence; and rapport building. These skills have been significantly developed among the students.

Out of 56 MSW students, it is found that major proportion more than half of the students were poor or very poor in delegation skills before camp. This proportion has been significantly reduced to less than one-tenth. On the other hand, this skill has been developed in a significant proportion more than three-tenth which was only less than one-tenth before camp. A significant proportion more than three-tenth students were poor or very poor in giving and receiving feedback before camp. This proportion has been significantly reduced to (5.4 percent). On the other hand, this skill has been developed in a significant proportion more than two-fifth, which was only less than one-tenth before camp. Further, a major proportion more than three-fifth students were poor or very poor in conducting meetings before camp. This proportion has been significantly reduced to less than one-fifth. On the other hand, this skill has been developed in a significant proportion less than two-fifth, which was only (3.6 percent) before camp. A better proportion more than two-fifth students were poor or very poor in emotional intelligence before camp. This proportion has been significantly reduced to more than one-tenth. On the other hand, this skill has been developed in major proportion more than half which was more than one-tenth before camp. Further, a significant proportion less than two-fifth students were poor or very poor in rapport building before camp. This proportion has been significantly reduced in more than one-tenth. On the other hand, this skill has been developed in major proportion more than three-fifth, which was about one-fourth before camp. Every student was responsible to perform committee responsibilities and micro planning related activities. They were to work independently in dealing with community

members. Meeting key persons of the community, mobilizing people to conduct focused group discussions made them to develop leadership skills (see table-2). It is true in case of *Siddanna (name changed) who had inferior complex in order to lead group for performing awareness programmes in the community. As a result of training programmes, demonstrations, and adequate preparations, he could lead the cultural committee for organizing different cultural performances and mobilizing good number of community members to the cultural programme.*

Learning Skills

An attempt has been made to assess the impact of multi-module training interventions on the learning skills of the students. The learning skills focused were; getting organized to study; finding time to study; collecting sources of information for the study; and writing skills. These skills have been significantly developed among the students.

Out of 56 MSW students, it is found that better proportion more than two-fifth was poor or very poor in getting organized to study before camp. This proportion has been significantly reduced to less than one-tenth. On the other hand, this skill has been developed in a significant proportion more than two-fifth, which was only less than one-tenth before camp. A good proportion more than two-fifth students were poor or very poor in finding time to study before camp. This proportion has been significantly reduced to less than two-fifth. On the other hand, this skill has been developed in a significant proportion more than two-fifth, which was more than one-tenth before camp. Further, a major proportion more than half of the students were poor or very poor in collecting sources of information to study before camp. This proportion has been significantly reduced to more than one-tenth. On the other hand, this skill has been developed in a significant proportion more than three-tenth which was less than one-tenth before camp. A major proportion more than half of the students were poor or very poor in writing skills before camp. This proportion has been significantly reduced to less than one-fifth. On the other hand, this skill has been developed in major proportion more than half, which was about one-fourth before camp. Learning and unlearning was part of learning in the camp. Each student was given individual feedback in terms of learning skill that has enabled them to enhance their learning skills in terms of time management, organizing material to study and writing (see table-2). It is true in case of *Ravi (name changed) who was responsible to lead a team to visit different government and non-government organization institutions functioning in the community where social work camp was organized. He delegated with a team and could successfully collect required secondary data. He was able to manage conduct meetings with officials of the institutions and collect required data.*

Presentation Skills

An attempt has been made to examine the impact of multi-module training interventions on the presentation skills of students. The presentation skills explored among were; preparing a presentation; presenting data; coping with nerves of presentation; dealing with questions; and presentation in a particular circumstance. These skills have been significantly developed among the students.

Out of 56 MSW students, it is found that major proportion half of the students were poor or very poor in preparing a presentation before camp. This proportion has been significantly reduced to more than two-fifth. On the other hand, this skill has been developed in a significant proportion more than one-tenth (12.5 percent) which was (10.7 percent) before camp. A major proportion half of the student was poor or very poor in presenting data before camp. This proportion has been significantly reduced to more than one-tenth. On the other hand, this skill has been developed in a significant proportion more than two-fifth, which was only (3.6 percent) before camp. Further, a better proportion more than three-fifth students were poor or very poor in coping with nerves of presentation before camp. This proportion has been significantly reduced to more than one-fifth. On the other hand, this skill has been developed in a significant proportion one-fourth, which was only (3.6 percent) before camp. A significant proportion less than three-fifth students were poor or very poor in dealing with questions before camp. This proportion has been significantly reduced to more than one-tenth. On the other hand, this skill has been developed in a significant proportion more than three-tenth which was only (5.4 percent) before camp. Further, a major proportion about seven-tenth student was poor or very poor in presentation in particular circumstances before camp. This proportion has been significantly reduced to more than one-fifth. On the other hand, this skill has been developed in a significant proportion less than one-fourth, which was only (3.6 percent) before camp. Activity wise presentation and sharing of their experiences made them to develop presentation skills to a greater extent (see table-2). It is true in case of *Saroja (name changed) who was responsible to consolidate the household data collected. She could manage to make a presentation of the empirical data in the grama sabha organized at the end of camp to appraise community members about facts related to community, focused areas and problem tree.*

Research Skills

An attempt has been made to examine the impact of multi-module training interventions on the research skills of the students. The research skills focused were; interview; observation; data processing; and analytical and identifying problems. These skills have been significantly developed among the students.

Out of 56 MSW students, it is found that significant proportion more than two-fifth students were poor or very poor in interview skill before camp. This proportion has been significantly reduced to only (5.4 percent). On the other hand, this skill has been developed in a significant proportion more than two-fifth, which was less than one-tenth before camp. A significant proportion more than half of the student was poor or very poor in observation before camp. This proportion has been significantly reduced to less than one-tenth. On the other hand, this skill has been developed in a significant proportion less than half, which was less than one-tenth before camp. Further, a good proportion about half of the students were poor or very poor in data processing before camp. This proportion has been significantly reduced to more than one-tenth. On the other hand, this skill has been developed in a significant proportion more than two-fifth, which was more than one-tenth before camp. A major proportion more than two-fifth students were poor or very poor in analytical and identifying problems before camp. This proportion has been significantly reduced to more than one-tenth. On the other hand, this skill has been developed in a significant proportion more than one-fourth, which was only (1.8 percent)

before camp. Visiting households independently, building rapport, collecting primary data, processing of data, analyzing the data and arriving at conclusion made them to develop research skills (see table-2). It is true in case of *Danayya (name changed) who was a leader of Research Committee, was to coordinate household survey, processing of primary data, draw frequency distribution and convert frequencies into percentages. Prepare report on household data and analyse data with descriptive statistical measures.*

Table-2: Impact of Multi-Module Training on different Skills

Skill area	Skills	Excellent		Good		Manageable		Poor		Very Poor	
		Before	After	Before	After	Before	After	Before	After	Before	After
`Personal	Self Control	00 (00)	6 (10.7)	12 (21.4)	31 (55.4)	16 (28.6)	16 (28.6)	19 (33.9)	3 (5.4)	9 (16.1)	00 (00)
	Being Good Tempered	1 (1.8)	4 (7.1)	8 (14.3)	29 (51.8)	28 (50.0)	23 (41.1)	14 (25.0)	00 (00)	5 (8.9)	00 (00)
	Friendliness	00 (00)	8 (14.3)	18 (32.1)	29 (51.8)	17 (30.4)	16 (28.6)	12 (21.4)	3 (5.4)	9 (16.1)	00 (00)
	Time Mgt.	2 (3.6)	7 (12.5)	11 (19.6)	26 (46.4)	17 (30.4)	18 (32.1)	17 (30.4)	5 (8.9)	9 (16.1)	00 (00)
	Stress Mgt.	00 (00)	4 (7.1)	4 (7.1)	29 (51.8)	29 (51.8)	20 (35.7)	15 (26.8)	3 (5.4)	8 (14.3)	00 (00)
Inter-personal	Verbal Communication	1 (1.8)	4 (7.1)	7 (12.5)	16 (28.6)	14 (25.0)	31 (55.4)	25 (44.6)	4 (7.1)	9 (16.1)	1 (1.8)
	Non-verbal Commun.	00 (00)	1 (1.8)	5 (8.9)	19 (33.9)	23 (41.1)	31 (55.4)	17 (30.4)	5 (8.9)	11 (19.6)	00 (00)
	Listening	3 (5.4)	5 (8.9)	5 (8.9)	31 (55.4)	26 (46.4)	17 (30.4)	15 (26.8)	2 (3.6)	7 (12.5)	1 (1.8)
	Questioning	00 (00)	3 (5.4)	2 (3.6)	20 (35.7)	15 (26.8)	23 (41.1)	27 (48.2)	7 (12.5)	12 (21.4)	3 (5.4)
	Working in Groups	00 (00)	6 (10.7)	13 (23.2)	28 (50.0)	22 (39.3)	15 (26.8)	12 (21.4)	6 (10.7)	9 (16.1)	1 (1.8)
Leadership	Delegation	00 (00)	2 (3.6)	2 (7.1)	17 (30.4)	22 (39.3)	33 (58.9)	23 (41.1)	3 (5.4)	7 (12.5)	1 (1.8)
	Giving and receiving feedback	2 (3.6)	7 (12.5)	3 (5.4)	16 (28.6)	32 (57.1)	30 (53.6)	11 (19.6)	2 (3.6)	8 (14.3)	1 (1.8)
	Conducting meetings	00 (00)	00 (00)	2 (3.6)	22 (39.3)	17 (30.4)	24 (42.9)	25 (44.6)	9 (16.1)	12 (21.4)	1 (1.8)
	Emotional Intelligence	00 (00)	1 (1.8)	7 (12.5)	29 (51.8)	24 (42.9)	19 (33.9)	18 (32.1)	6 (10.7)	7 (12.5)	1 (1.8)
	Rapport Building	00 (00)	6 (10.7)	14 (25.0)	30 (53.6)	20 (35.7)	14 (25.0)	12 (21.4)	5 (8.9)	10 (17.9)	1 (1.8)
Learning	Getting organized to study	1 (1.8)	2 (3.6)	4 (7.1)	22 (39.3)	27 (48.2)	28 (50.0)	23 (41.1)	4 (7.1)	1 (1.8)	00 (00)
	Finding time to study	1 (1.8)	2 (3.6)	7 (12.5)	22 (39.3)	25 (44.6)	23 (41.1)	18 (32.1)	9 (16.1)	5 (8.9)	00 (00)
	Sources of information for study	00 (00)	1 (1.8)	4 (7.1)	16 (28.6)	23 (41.1)	32 (57.1)	19 (33.9)	6 (10.7)	10 (17.9)	1 (1.8)
	Writing	3 (5.4)	8 (14.3)	11 (19.6)	21 (37.5)	18 (32.1)	16 (28.6)	11 (32.1)	10 (17.9)	13 (23.2)	1 (1.8)
Presentation	Preparing a Presentation	1 (1.8)	4 (7.1)	6 (10.7)	20 (35.7)	21 (37.5)	26 (46.4)	17 (30.4)	6 (10.7)	11 (19.6)	00 (00)
	Presenting Data	00 (00)	1 (1.8)	2 (3.6)	23 (41.1)	26 (46.4)	25 (44.6)	11 (19.6)	6 (10.7)	17 (30.4)	1 (1.8)
	Coping with presentation nerves	00 (00)	1 (1.8)	2 (3.6)	13 (23.2)	16 (28.6)	29 (51.8)	26 (46.4)	13 (23.2)	12 (21.4)	00 (00)
	Dealing with questions	00 (00)	2 (3.6)	3 (5.4)	18 (32.1)	21 (37.5)	28 (50.0)	19 (33.9)	7 (12.5)	13 (23.2)	1 (1.8)
	Presentation in Particular circumstances	1 (1.8)	1 (1.8)	1 (1.8)	12 (21.4)	15 (26.8)	31 (55.4)	23 (41.1)	11 (19.6)	16 (28.6)	1 (1.8)
Research	Interviewing	00 (00)	6 (10.7)	4 (7.1)	18 (32.1)	29 (51.8)	29 (51.8)	14 (25.0)	3 (5.4)	9 (16.1)	00 (00)
	Observation	00 (00)	2 (3.6)	4 (7.1)	25 (44.6)	23 (41.1)	24 (42.9)	15 (26.8)	5 (8.9)	14 (25.0)	00 (00)
	Data processing	00 (00)	3 (5.4)	8 (14.3)	20 (35.7)	20 (35.7)	26 (46.4)	12 (21.4)	7 (12.5)	16 (28.6)	00 (00)
	Analytical and Identifying problems	00 (00)	2 (3.6)	1 (1.8)	13 (23.2)	21 (37.5)	34 (60.7)	14 (25.0)	7 (12.5)	20 (35.7)	00 (00)

*Figures in parenthesis are percentages

Conclusion

The present study is an attempt to make multi-module training interventions with post graduate social work students in order to equip them with required skills, knowledge and competencies for better community engagement and practice community organization method during social work camp. Success of any camp is in achieving all its objectives and developing confidence among students to work in with the communities independently. Hence, an attempt was made to develop a multi-module training intervention and see its impact on professionalism and different domain of skills essential for community organisers. Commitment to excellence in education, and excellence in practice, is a prime issue of ethical responsibility. It affects the quality of services provided by professional social workers to the community (Taylor and Francis, 1986). Social work camp is one of the practices of social work practicum to understand the practice of community organization which is based on the principle of learning by doing. Learning is endless while working in communities. Every camp gives holistic exposure to students and a new experience to social work educators. Social work skills, techniques, values and principles are imbibed by student social workers in the processes of organizing social work camp. Developing professionalism and required set of skills is need of the hour in order to develop expertise and address complex changing issues of community. Multi-module training interventions have something to do with developing personal, interpersonal, leadership, learning, and presentation and research skills among the post graduate social work students. It is suggested to replicate this module of interventions and triangulate the impact of interventions elsewhere in the interest of profession.

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South Asian Journal of Participative Development
Vol.25, No.2 (Spl.), July - Dec. 2025
ISSN No: 0976-2701

From University to Community: Participatory Action Research for Viksit Bharat @ 2047: A Case Study of Bahirwadi Village

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Abstract

Field learning plays a leading role in social work education, and as such, social work educators and field instructors need to know how their students learn and develop during the field education experience; by being aware of the ways in which students learn and develop in social work agencies, educators and instructors can better understand students' educational needs and find ways to best support them through the learning process in practice.

Social work theories help social workers analyse cases, understand clients, create interventions, predict intervention results, and evaluate outcomes. While the theories are constantly evolving as new evidence is produced, referencing social work theories that have been used over time enables social workers to explore causes of behaviour and identify potential solutions.

Empowerment is both a value orientation for working in the community and a theoretical model for understanding the process and consequences of efforts to exert control and influence over decisions that affect one's life, organizational functioning, and the quality of community life (Perkins & Zimmerman, 1995 and e'tal.) Empowerment theory is a central tenet of the National Association of Social Workers (NASW) Code of Ethics, as part of the profession's commitment to social justice. Empowerment theory holds that social workers must support clients and their communities in building connections, fighting injustice and creating grassroots organizations. Empowerment theory, like conflict theory, aims to change society rather than provide a treatment model for individuals.

From the academic year 2017-18 under the Institutional Social Responsibility the Tilak Maharashtra Vidyapeeth, Pune has adopted the tribal village entitled Bahirwadi from Purandar Block of Pune District. The department of Social Work has initiated the Field Action Project namely Bahirwadi Village Development Field Action Project. The department has done need assessment through the PRA and PLA, based on the need assessment under this field action projects the department has decided the core areas of social work intervention such as Health intervention, Livelihood Generation, Natural Resource Management, Education and Training, Women and Child development, Entrepreneurship development, Positive Ageing and strengthening of Local Self Governance Body (Gram Panchayat) etc. The researcher has conducted participatory action research study with women in which the need assessment study was conducted and based on that the social work intervention was adopted through capacity building and training programs such as Poultry farming, Dairy development, Goat farming and Mushroom farming for generating sustainable livelihood opportunities. Through this initiative the women got benefitted and every woman has started their startup such as Goat farming, Dairy Development and Poultry farming. Initially one of Khushi SHG group has started the Goat farming business with 10 goats and within one year they have generated the 200 goats and sheep's on large scale.

The result of this FAP is found that women got the sustainable livelihood opportunities in the village; the daily based migration for wages has decreased at 60 to 70 percent. Also women have politically empowered and 3 of them have elected as unopposed members of Gram Panchayat. This paper focuses on Community Empowerment Theory and Social Work Intervention through Field Action Project for the Sustainable Livelihood based on the participatory action research.

Key Words: Bahirwadi Village Development, Field Action Project, Discovery, Community Empowerment Theory

Introduction

Contemporary social work practice is increasingly becoming complex and challenging. Social workers are engaged in working with society's most vulnerable, disadvantaged and deprived sections of the population who require help with multiple needs. The situations and needs requiring social work intervention could be intrapersonal, inter-personal, inter-group or inter-organizational (Dr.I.S.Subhedar, 2011).

Participatory Rural Appraisal (PRA) is an approach to the analysis of local problems and the formulation of tentative solutions with local stakeholders. It makes use of a wide range of visualization methods for group-based analysis to deal with spatial and temporal aspects of social and environmental problems. PRA is an intensive systematic but semi structured learning experience carried out by multidisciplinary team in a community with community members.

Social Work Education and an argument: Fieldwork is the most essential part of the social work education and training. Taking an overview of the present situation of the fieldwork training, its nature, scope, professionalization, problems and difficulties and the needs, it may be observed that the universities and the colleges of social work lack something in imparting comprehensive field work training to the students.

In the field work training itself, there are certain deficiencies and shortcomings. The most important aspect are the policies of the universities and the colleges of social work whereby the theoretical and practical curriculum are formulated and arrangements are made or imparting education and training according to the prescribed curricula.

Experimental approach in Fieldwork practicum: The fieldwork practicum needs to use the pedagogical or the experimental approach. According to Johnson (1986), experimental learning is based on three assumptions,

1. People learn best when they are personally involved in the learning experience;
2. Knowledge has to be discovered if it is to mean anything or make a difference in behavior; and
3. Commitment to learning is highest when people are free to set their own learning goals and actively pursue them within a given framework.

Background of Bahirwadi Village:

The Bahirwadi village has located in eastern region of Purandar block of Pune District, behind the Purandar Fort. The Village consisting of four colonies along with four neighboring communities / vasties like, Boudh Vasti, Jankar Vasti, Makhalmachi and Badevawadi etc. The total population of Bahirwadi is 688 (2011 Census Data) in which most of the youth population occurs migrant due to search of service for their livelihood. The main occupation of the villagers is rice farming. Most of the aged people, dominating population of women & farmers are residing in the village.

Community Profile of Bahirwadi Village:

1. Name of the Community: Bahirwadi
2. Address: At- Bahirwadi, Po- Kaldari, Tal- Purandar, Dist- Pune.
3. Historical Background of Community:

The Bahirwadi village has located eastern region and exactly behind the Purandar Fort. During the Chh. Shivaji Raje Bhosale Rule those people who were doing the evil social problems like violence against women, bribe, theft etc; such people were thrown behind the fort. That activity was called as Kaldari. At the beginning of the Purandar fort around 450 years ago there was a Temple of God Kalbhairavnath. For worshiping to god Kalbhairavnath the Chh. Shivaji Raje Bhosale had appointed the person called Bhagat in those days. That Bhagat people has taken initiatives for the establishment of their community. Therefore, on the name of Kalbhairavnath God the Bahirwadi village has been established during that period. There is relevance between God Kalbhairavnath and name of the Bahirwadi village.

4**. Demographic (Geographic) Information:**

The Bahirwadi village has located in southern region of Purandar block of Pune District, behind the Purandar Fort. The Village consisting of four colonies along with four neighboring communities / vasties like, Boudh Vasti, Jankar Vasti, Makhalmachi and Badevawadi etc. The total population of Bahirwadi is 688 in which most of the youth population occurs migrant due to search of service for their livelihood. The main occupation of the villagers is rice farming. Most of the aged people, dominating population of women & farmers are residing in the village.

The Bahirwadi village falls under the Rain fed area in the Purandar Block. The Bahirwadi having rich natural and cultural heritage. The natural resources like Water, Land, Forest, Live stock and Human Resource. The River originated from Purandar fort is floating from the village. There are two wells around the Village, One Lake and One Bore Well near to Z. P. School. People are using drinking water which is lifted from well. Majority of the people had migrated for their livelihood. Rests of the people are doing daily wages in nearby villages. Very few people having their own farm and they are engaged in seasonal farming. During the Rainy season only Rice Farming is cultivated. For agricultural purpose the people are using the water from the River.

Every year after the end of December month there is scarcity of water for both the purposes i.e. domestic use and agriculture. Every year Bahirwadi people are facing draught situation. Though there are sources of watershed programs but due to hard rock topography the water does not gets percolate in the land. Therefore, the level ground water has gone down.

5. **Population:**

According to the Census 2011 the total population of the Bahirwadi village is 688. It consists of dominating population near about 90 percent belongs from the Mahadev Koli Community, and test of the 10 percent of the population is belongs from the Dhangar community and Boudh Community.

House Wise: There are 149 houses in the Bahirwadi Village. The houses are located in the various colonies like, Gavali Vasti, Boudh Vasti, Jankar Vasti, Makhalmachi and Bapdevawa.

(b) Gender Wise: Gender is social and cultural construct. Gender plays an important role in socio-cultural development. Out of the total population 688 there are 325 is Male population and 363 female populations which is dominant in nature. But unfortunately for the purpose of survival and in the search of livelihood the majority of the active population has migrated at Mumbai and Pune along with their family members.

(c**) Age Wise:** Age very important variable. It plays vital role in the overall development of an individual. There are 70 children's found in the village out of 37 students are enrolled for the Primary education in Z. P. school and rest of them are taking further education in Kaldari village. Also there are 70 Youths found in the village. The ageing population is 120, probably staying in the village along with the small kids. Rest of the population is consisting of Male and Female which falls under Middle age group. (d) Occupation Wise: Out of total population there 80 percent of the people are working as daily wage workers. Only 10 percent people are engaged in agricultural sector. As far as youths are concerned they are engaged in seasonal employment. Rest of the days they are free and most of the times they are engaged in other activities like sports, animal husbandry etc. But unfortunately that youth are having the habits of the de-addiction such as liquor drinking, chewing tobacco and Gutakha.i etc.

6. **Common Places of the Meetings:** The Grampanchyat office is located to nearby the Z. P. School. At present unfortunately that office is not in working condition. Therefore the temple of god Kalbhairavnath is the common place of meetings. The social and cultural activities are being organized every year in the hall of temple.

7. **Customs, Tradition, Superstitions: a) Customs:** After Seventy years of Independence, the traditional occupations are done by the local people. The Bhagat Community people are doing the worship to the god. The Gavali community people are engaged in the cattle raring activity and distributing the milk in the village. The people have more faith on the god. Therefore the child marriage is the custom of this village. The Shimpi community people are engaged in Tailoring activity. The Kumbhar community people are engaged in preparation of the pots.

b) Traditions: The dominating tradition of the village is that the women should not wear the chappals or sandals/ shoes while walking in front of the temple. It clearly states that there is great gender discrimination in the village. Women don't have the access to the common places. On every Sunday the Bhagat so called Pujari is always use to tell the future to people. Also during the Datta Jayanti Utsov the villagers do not wear the chappals & Shoes for three days. Every year the annual fair is organized in the village; during the fair the person Bhagat having the key role as a Mankari.

c) **Superstitions:** The villagers having big belief on god Kalbhairavnath. It is also found that the people having more misbelieve. The women are not getting entry in to the temple. The entry is restricted for women still in the 21st century. On every Sunday the Bhagat so

called Pujari is always use to tell the future to people, on the same day the special worship is being arranged by the Bhagats. The person who has affected by snakebite that person should take more than five rounds to the temple of god Kalbhairavnath. This is the biggest superstition found among the villagers.

8. Attitudes, Beliefs and Prejudices:

a) **Attitudes:** Gender inequality found universally. In the Bahirwadi village there is great gender discrimination. The women having the low dignity and status. Also women are not allowed to participate in social and cultural programs. The women having the restrictions to entry into temple. The perspectives towards women are biased in nature. The villagers having narrow minded perspectives towards girl child and their education and marriage. The early marriages of girls i.e. child marriages are done by the villagers. The villagers are not ready to give further higher education to their children's. The perspectives towards education are not developed among the villagers. Therefore after completing education up to 10th level the children's are joining the contractual labourers kind of work. They are engaged in seasonal employment and whatever income has generated that is invested on kinds like mobile phones, Tele Vision and other entertainment activities. So the Youths don't have the long term perspectives towards their employability.

b) **Beliefs:** The villagers having great belief on god Kalbhairavnath. The Bhagat so called Pujari is always use to tell the future to people, on the same day the special worship is being arranged by the Bhagats. Whatever the information sought by the Bhagat is valid for the villagers. Therefore the people believe on Bhagat. Due to lack of caste certificate the Gram Panchayat body has not established in the village. Due to political unrest and other factors, the administrative and developmental work has been look after by the village development officer i.e. Gram Sevak. So people are also believes on the person Gram Sevak.

c) **Prejudices:** The villagers do not have the unity among them. They have the prejudices about each others. People having the prejudices about women, girl child education, child marriages etc.

d) **Religious, Political and Cultural Groups**: Religious Groups: The person Bhagat having the key role as a Mankari. The Bhagat so called Pujari is always use to tell the future to people, on the same day the special worship is being arranged by the Bhagats. Whatever the information sought by the Bhagat is valid for the villagers. Therefore, the people believe on Bhagat.

Political Groups: Due to lack of caste certificate, the Gram Panchayat body has not established in the village. Due to political unrest and other factors, the administrative and developmental work has been looked after by the village development officer i.e. Gram Sevak. So people are also believing on the person Gram Sevak. Probably the political groups are not found in ordinary life of the villagers but when elections are announced by the government these political groups are being in the active mode. Mainly Nationalist Congress Party, National Congress Party and Shivsena etc. groups are found in the village. Once elections over these groups are get closed and people are coming together for further social and cultural activities with the belief of god *Kalbhairavnath.*

Cultural Groups:
Ideally there is no any kind of cultural group found in the village. The person Bhagat having the key role as a Mankari. The bhagat having great dignity and place in the cultural activities of the village. All the cultural activities are looking after by the Bhagat. Due to dominating population of Mahadev Koli community majority of the cultural programs are being organized.

The Development Phase of Bahirwadi Village is started through Self Help Group Movement
From the academic year 2017-18 under the Institutional Social Responsibility the Tilak Maharashtra Vidyapeeth, Pune has adopted the tribal village entitled Bahirwadi from Purandar Block of Pune District. The department of Social Work has initiated the Field Action Project namely Bahirwadi Village Development Field Action Project. The department hasdone need assessment through the PRA and PLA, based on the need assessment under this field action projects the department has decided the core areas of social work intervention such as;

Women and Child Development
Under the core area of Women and Child Development the Department of Social Work, in collaboration with the UMED project office of Maharashtra State Rural Livelihood Mission office of Purandar Block Panchayat, Purandar and with cooperation of Bahirwadi Gram Panchayat the vardhini round was arranged from 02/02/2020 to 14/02/2020. The valedictory of said training program was organized, during this vardhini round the 7 vardhinis has done 149 household survey and the 11 SHG groups were formed. For sustaining the 11 SHG groups all women had elected to MS. Supriya Kokare as the Community Resource Person, who will look after the guidance and progress of SHGs in Bahirwadi village.

In the month of December 2019, the Rural Education camp of MSW students of Department of Social Work, Tilak Maharashtra Vidyaeeth was carried out in the village. During the said camp the Cluster Coordinators, Mr. Ramesh Bandalkar and Mr. Sagar Dhakane has visited and addressed to all Women about UMED project under MSRLM program. The said training program was organized for the wellbeing of vulnerable communities and divyang people of the village. The total 149 families were surveyed and the vardhinis has formed 11 SHG groups out of that 8 were of Women, 02 of Divyang People and 01 is of Vulnerable community people.

During the Valedictory ceremony program of said training the Block Mission Manager Ganesh Tikale has addressed to all participant women how to prepare and keep the records of SHG activities and financial aspects of the groups. Then cluster coordinator Ramesh Bandalkar has addressed that after forming the SHGs and Gram Sangh in the village what kind of facilities will be received. Also the government will provide the Rs. 150000 corpus funds to the SHG groups. The cluster coordinator Swapna Athawale has guided about 10 points program of UMED for SHG groups.

Followed by the discussions the Dr. Prakash Yadav, Head of the Department of Social Work has addressed to women about availability of employment in the village through MGNREGA Act 2005, if the women get employment opportunities in the village that women required Job cards. So sir has requested to Village Development Officer to make availability of the job cards at the earliest. Then on behalf of Tilak Maharashtra Vidyapeeth, the self employment training will be given to all women in the village through Kasturba Khadi Gramudyog Vidyalaya, Pune. After the self employment training women will establish their social entrepreneurship and they will get the minimum level of income at local level. The all women had taken oath for not go outside for the daily wages from forthcoming international women day i.e. 08th March 2020. Also Dr. Yadav has made appeal to all women that with neglecting internal conflicts all women should come on common platform the self and village development. If the women are in planning procedure of Village development then no one should stop for the development of village.

For the said program the Sarpanch, Deputy Sarpanch and All the members of Gram Panchayat, Officials of Purandar Panchayat Samiti, Students Social Worker and Anganwadi Worker, Head Master of Z. P. School Bahirwadi had given significant contribution.

Background of the Project:

Pre- Social Work Intervention Situation of Bahirwadi Village:

When the baseline and need assessment study was conducted it was found that there were huge social issues as well as problems related to natural resources too. Due to water scarcity, there was huge issue of livelihood. In the search of employment, the active population was migrated in nearby cities like, Pune, Mumbai, Shirwal, Kapurhol, Jejuri etc.

Apart from that there was no employment opportunities, addiction among youths, the social welfare schemes and programs were not reached to the beneficiaries. Socially, economically, politically and educationally Bahirwadi village was deprived by the Government side. Therefore, considering these above-mentioned issues, Under Institutional Social Responsibility the Tilak Maharashtra Vidyapeeth has adopted this village and Department of Social Work has conducted the Field Action Project.

In the search of livelihood women were use to go for daily wages every day without a single day weekly off. On the occasion of International Women Day i.e. 08th March 2020, in the meeting of Gram Sangh it has been discussed and decided that from the same day the women will not go outside the village for the employment or for daily wages work. The project team has done the need assessment of women through the group meeting and the prioritization of the needs has been decided. In this context the women has asked to research team and project director to give the training of self employment probably related with the Poultry Farming and Goat Farming.

Objectives of the Project:

1. To apply the social work entrepreneurship initiatives for Tribal Women for the sustainable livelihood
2. To give the access benefit and control over the educational resources to the children's of Bahirwadi Village

3. To study the health situation and transitions in the study area
4. To avail the skill development training and provide the employment opportunities to the youth population in study area.
5. To develop the ecofriendly village system in the study area.

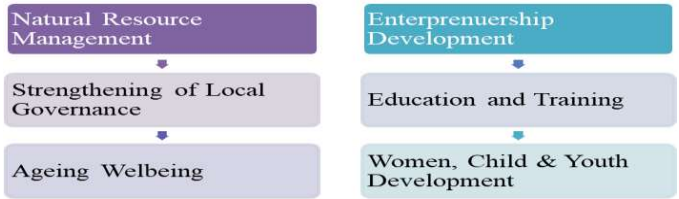
Methodology Used:

In the participatory methodology, it is assumed that knowledge and education are never neutral and the trainer's role is help to the participants understand where their own views have come from, to challenge pre-conceptions and to encourage them to consider other possibilities. It assumes that society can be transformed by the engagement of critically conscious persons, through a process of deconstruction, reconstruction and transformation. Participants' life experiences are the major source of knowledge in this method. The trainers are not teachers, but facilitators, and partners with the participants in this process of social change. The Participatory Action Research has been adopted for this project. In which the Research Project team has conducted the need assessment study through personal interviews and group meetings. The Participatory Rural Apriasal has been adopted .

Research Methodology and Process Followed:

Areas of Social Work Intervention:

Based on the need assessment study following areas of the Social Work Intervention were decided;



Major Social Work Interventions Conducted for Sustainable Livelihood:

Area of Social Work Intervention	Number of Programs / Activities Conducted	Partner / Collaborating Organization	Number of Beneficiaries
Access to Health Care Services (Mobile Ambulance Project)	06	Parinche PHC, Bharati Hospital, HFCF, Pune, Gestamp CSR	688 and 20 Villages Tribal Belts
Women Children & Youth Development	05	NYKS, MITCON, Jansewa Centre	158 Women & Children, Youths
Natural Resource Management	06	Kesari Maratha Trust, TMV, Vanrai, CRDF, Purandar Panchayat Samiti.	1033 Villagers
Village Development Project (Social & Infrastructure)	05	Maharashtra State Commission for Women, Mumbai, Purandar Panchayat Samiti.	958 Villagers
Educational Programs: Digital School & Anganwadi	05	Gram Panchayat Bahirwadi, Aksharsparsh Organization.	96 School going Children's
Enterprenuership Development	06	Purandar Panchayat Samiti, RSETI- MAHABANK, Kasturba Khadi Mahila Vidyalaya	250 Women
Covid 19 Pandemic Resillence Initiatives	02	Kshitij Foundation, Udaykal Foundation, Seed India , Mudita Foundation , Shanti Foundation.	77765 Tribal Families
Covid Free Village	02	Gramin Vikas Sanstha, Bharati Hospital, Bahirwadi Gram Panchayat	688 Villagers
Total	27 Social Work Intervention Programs	23 Organizations (Govt. & Non-Government)	11536 Beneficiaries

Source: Field Study Data from Bahirwadi Village

The above table shows that the research study is Participatory Action in nature. Based on the need assessment study the group meetings and Gaon Sabha were conducted and in these meetings the priorities of the needs and problems were fixed and the areas of social work intervention were decided. In collaboration with the 23 Government and Non-government organizations 27 Social Work Intervention programs were carried out and the 11536 beneficiaries including, Women, Children and Youth's, Elderly, and villagers got benefitted.

The researcher has conducted participatory action research study with women in which the need assessment study was conducted and based on that the social work intervention was adopted through capacity building and training programs such as Poultry farming, Dairy development, Goat farming and Mushroom farming for generating sustainable livelihood opportunities. Through this initiative the women got benefitted and every woman has started their startup such as Goat farming, Dairy Development and Poultry farming. Initially one of Khushi SHG group has started the Goat farming business with 10 goats and within one year they have generated the 200 goats and sheep's on large scale.

The result of this FAP is found that women got the sustainable livelihood opportunities in the village; the daily based migration for wages has decreased at 60 to 70 percent. Also women have politically empowered and 3 of them have elected as unopposed members of Gram Panchayat. This paper focuses on Community Empowerment Theory and Social Work Intervention through Field Action Project for the Sustainable Livelihood based on the participatory action research.

Sustainability of the Project:

Sustainable Development: Rural development as a part of social change is defined as a process of expanding the decision-making horizon and extending the time frame for appraising investment and consumption choices by rural disadvantaged people collectively and not necessarily at the village levels of aggregation. Sustainable development is nothing but the community people have participate in observation, survey, planning, policy or scheme formulation & implementation, monitoring and evaluation, and fallow up, etc. process.

After getting the Training every women has started their start up of Poultry Farming and significantly the Goat farming. Initially there were 10 Goats purchased now it becomes 150 goats and ships.

Outcomes observed:

The following outcomes were found such as;

- Women were able to start their own start ups,
- Decreased the Migration
- Level of Income is increased
- Participation of Women in Gram Sabha
- It helps for their sustainable livelihood

Acknowledgement:

The researcher would like to acknowledge the help received from the Vice Chancellor and all the Office bearers of Tilak Maharashtra, Faculty members , Students and PhD. Research Scholars from the Department of Social Work, TMV, Parinche PHC, Bharati Hospital, HFCF, Pune, Gestamp CSR, NYKS, MITCON, Jansewa Centre, Kesari Maratha Trust, TMV, Vanrai, CRDF, Maharashtra State Commission for Women, Mumbai, Purandar Panchayat Samiti, Gram Panchayat Bahirwadi, Aksharsparsh Organization, RSETI- MAHABANK, Kasturba Khadi Mahila Vidyalaya, Kshitij Foundation, Udaykal Foundation, Seed India , Mudita Foundation , Shanti Foundation, Gramin Vikas Sanstha, etc.

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South Asian Journal of Participative Development
Vol.25, No.2 (Spl.), July - Dec. 2025
ISSN No: 0976-2701

Evidence-Based Practice in Child Welfare: A Systematic Review

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Abstract

Evidence based practice (EBP) is a systematic approach to decision making in child welfare practice. EBP is growingly recognised as essential for strengthening child welfare outcomes, intervention, implementation in welfare agencies. Several researches highlight an improving body of evidence-based interventions, leadership and organisational factors influencing implementation, and identifying gaps in cultural adaptation, insufficient training infrastructure, and workforce support. The literature is an integrated synthesis that connects intervention effectiveness, implementation level conditions and barrier to evidence use within child welfare setting. The study synthesizes evidences drawn from the intervention studies in child welfare. A systematic literature review was conducted using 27 published studies. The review followed PRISMA guidelines. Included studies examined evidence-based or evidence-informed interventions in child welfare, implementation processes, leadership, and workforce factors, or system-level barriers and enablers of EBP. Data were extracted from the ONOS database especially focused on the domain of evidence-based practice (EBP). The finding of this study indicates strong evidence for structured intervention such as Safe Care, parent training model, support program, treatment foster care and reunification support programme. The implementation success depends upon the supervision quality, leadership and workforce attitudes towards evidence-based practice. Several studies show the challenges in evidence-based practice in institutions like insufficient training infrastructure, cultural mismatch of intervention and lack of ideal service system. This review identifies the effective evidence-based interventions in child welfare, and sustainable implementation needs organisational support, coordination, leadership engagement and cultural leaning. The finding emphasizes the need to strengthen organisational capacity, system level strategies, and frontline practice in the child welfare system.

Keywords: Evidence Based Practice, Child Welfare, Evidence Informed Practice, Child Welfare Workforce

Introduction

Child welfare refers to all the services, policies and supports that help keep children safe, healthy and able to grow well within their families and communities. The main focus is to protect children from abuse, neglect, exploitation, violence and harm and to ensure they receive proper care, education and emotional support. According to UNHCR's child protection mandate includes psychosocial support, family tracing and reunification services for unaccompanied or separated children ensuring birth registration, support for children with disabilities and safe environments for living, learning and playing.

Child welfare system should adopt evidence-based practice (EBP) to guide these interventions, meaning that decisions and services are informed by the best available research, professional expertise and the needs of children and families. Evidence based practice helps ensure that programs designed for protection, care and rehabilitation are effective, culturally appropriate and improve outcomes for children in society.

Evidence Based Practice in Child Welfare

Child welfare system around the world face pressure to strengthen outcomes for children, families experience neglect, abuse and trauma. Children experience poor safety, stability and psychological distress in child welfare which emphasize the need of system transformation informed by evidence rather than tradition (McCarthy & Griffiths, 2021). Evidence based approaches have gained importance as a means of improving decision making, strengthening service quality, and ensuring transparency, accountability in child welfare institutions (Landsverk et al., 2011).

Evidence based practice (EBP) in child welfare refers to the integration of the best available research, practitioner expertise, and client perspectives in service delivery. Significant progress has been made in developing and testing structured, empirically supported interventions including Safe Care, parent training programs and Treatment Foster Care Oregon (TFCO) which demonstrate promising outcomes related to parenting skills, child safety and cost effectiveness. At the same time, policy reforms and system level initiatives have encouraged child welfare agencies to adopt evidence based program and improve their overall evidence capacity(Mapp et al., 2008). A substantial body of research highlights persistent barriers such as limited organisational willingness, lack of infrastructure, unskilled workforce, high caseloads, and inadequate training and supervision structure affects significantly. Leadership also plays vital role in shaping evidence based practice (EBP) implementation especially in resource allocation, create learning environments that support evidence use (McCarthy & Griffiths, 2021). Child welfare practice is becoming complicated by contextual and cultural challenges. Mostly families involved in child protection systems are often suspiciously Indigenous, minority, economical marginalised as the intervention developed in Western controlled research environments which is not its culture friendly (Grietens, 2013).

Research addressing evidence-based approaches in child welfare has expanded; it remains fragmented across various aspects including intervention effectiveness, leadership and organisational behaviour, workforce attitudes, cost benefit analyses, and system-level reforms. Existing systematic reviews tend to focus narrowly on specific domains, such as leadership or individual intervention models, rather than synthesizing the broader ecosystem of Evidence Based Practice (EBP) implementation in child welfare (McCarthy & Griffiths, 2021).

This systematic review addresses gap by synthesizing evidence from 27 articles related to evidence-based practice in child welfare. The review focuses how evidence-based practice applied in child welfare organisations; what kind of evidence-based interventions are used and what outcomes they produce and what organizational, systematic, and workforce factors influence the adoption and sustainability of evidence-based practice. This review aims to contribute a clearer understanding of the conditions under which evidence-based practice can improve outcomes for children and families involve in child welfare system.

Objective

The study intends to synthesize evidences from the intervention studies in child welfare. The study also focuses on implementation, effectiveness and sustainability of the evidence-based practice in Child Welfare.

METHODS

Review Design

This study followed the principle of a systematic literature review by using the systematic processes for searching the data, screening, synthesis and appraisal. This review focused on evidence-based practice, intervention studies, organisational research, policy analysis and workforce focused studies completely related to evidence-based practice and evidence informed practice in child welfare. Systematic literature methodologies have been used to analyse and evaluate the several dimensions of evidence-based practice in child welfare, especially service delivery system, leadership supports, interventions and supervision system practices.

Search Strategy

The studies on evidence-based practices in child welfare were searched in the month of November, 2025 by using the portal One Nation One Subscription (ONOS). This comprehensive search was conducted across available literature in the provided database. The systematic literature review study was included 27 studies those are based on evidence-based practice in child welfare. The search strategies followed the standard Systematic Literature Review (SLR) procedures based on the following core areas:

- Evidence Based Practice
- Child Welfare
- Child Welfare Intervention

Also include the studies of evidence based informed practice, practice-based evidence, child welfare intervention and implementation. Search term in combination included: *"Evidence based practice in child welfare"*. This approach aligns with the search strategy to find the best possible studies from the source data base which are used in the systematic literature review.

Inclusion Criteria

This study focused on evidence-based practice in child welfare and it follows the below criteria to include the studies in the SLR -

- Study those are focused on evidence-based practice, evidence informed practice, evidence-based interventions in child welfare.

- It includes intervention studies, implementation studies and effectiveness of welfare services, workforce or system level intervention and leadership attitude.
- Studies of empirical, conceptual and review papers included those are related to EBP and child welfare directly.

Exclusion Criteria

Studies those are not related to evidence-based practice were excluded from this systematic literature review; following are the criteria for exclusion -

- Studies not related to evidence-based practice like reflection of Act, legislation, analysis of historical, analysis without any evidence.
- Studies solely focused on non-child welfare.
- Intervention studies without relevant evidences.

Selection of the Studies

The flowchart of PRISMA framework in Fig. 1 illustrates the systematic process followed for the selection and inclusion of studies in our systematic review. The study selection process started with the identification of the studies through searching One Nation One Subscription (ONOS) databases found a total number of 91 records. The screening processes involve removing around 48 records by limits it into the two-core subject category such as "Social Science (Miscellaneous)" and "Social and Political Science", 43 studies screened, out of 91 studies based on these two-subject specification. Around 30 records were found which are directly related to topic as per the abstract and title of the study. Out of these 30, two studies found based on non-core theme which were irrelevant for the study and so excluded. Finally, after all the screening and exclusion processes, a total of 27 studies were included in the systematic literature review. This particular approach ensures a comprehensive rigorous selection of relevant articles for our study.

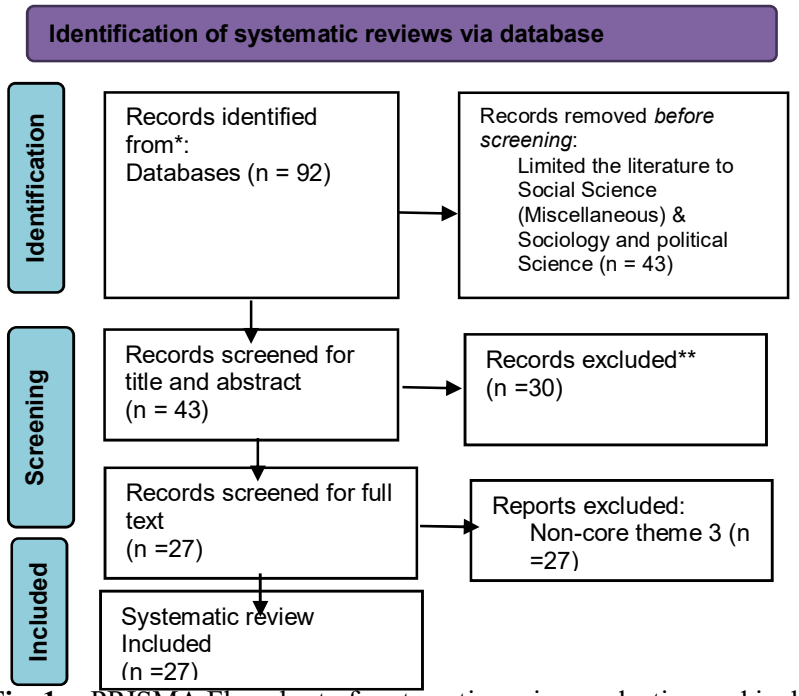

Fig. 1 PRISMA Flowchart of systematic reviews selection and inclusion process.

Review Characteristics

The included studies from this systematic review were published between the years 2005-2023. The geographical distribution of these studies spanned across different countries like USA, Australia, UK, Netherland and Canada. A total of 27 articles met the inclusion criteria for the systematic review. This study covered broad range of evidence-based child welfare practice topics including parent training programs, community-based family intervention, reunification, foster care alternatives, supervision and implication strategies. The geographical representation of the studies mentioned in fig.2.

From these 27 studies**,** 6 articles met the important criteria for evidence-based practice in child welfare intervention studies across the US, Canada and Australia. This represents key evidence-based welfare practices covering multiple intervention types, diverse methodological approaches and service model, practice strategies with measurable outcome for caregivers, children and case workers. These six studies include behavioural parent training model SafeCare, family based therapeutic intervention, reunification and supervision on targeted evidence practice in child welfare.

Fig. 2 Geographical distribution of the studies; Source: Map generated by using Open AI

Systematic Review of Intervention Studies

Systematic review was conducted across multiple studies accessing various evidence-based intervention related to child welfare service delivery and practices. 6 reviews focused on evidence-based intervention selected from the 27 studies. These studies focused on the intervention strategies used on the specific problem and discuss the result in relation to the evidence-based practice.

Caregivers' perspectives on the SafeCare programme Child & Family Social Work (Gallitto et al., 2018)

Problem statement

Child neglect is the most common form of child maltreatment in many child welfare systems and is associated with severe developmental, health and safety consequences. There is a need to examine not only efficacy trials but also caregivers' experiences and acceptability of evidence-based neglect interventions when implemented in local contexts (Gallitto et al., 2018).

Intervention
SafeCare is an 18-session, home-visiting, skills-based programme targeting child health, home safety, and parent–infant/child interaction delivered in home by trained providers using behavioural rehearsal, mastery criteria and regular fidelity monitoring(Gallitto et al., 2018).

Methods
Qualitative content analysis of semi-structured interviews with the first 30 caregivers, who completed SafeCare in Ontario (2014–2015). Interviews (20–60 min) were transcribed and coded using a hybrid deductive–inductive approach, inter-coder reliability reported. Providers also completed a family-adversity questionnaire to characterize the sample.

Results
- 87% of caregivers rated SafeCare positively, 90% would recommend it.
- The health module was most often reported as helpful, caregivers valued the manuals/charts and the step-by-step approach to treat illnesses.
- The safety module increased hazard awareness and practical skills but some found home assessments intrusive and requested more safety supplies.
- The parent–child interaction module improved routine, discipline strategies and parental sensitivity for many caregivers.
- There are some barriers like financial constraints, child removal/custody issues reduced opportunity to practice skills, program length/repetition for some, and distrust of the child-welfare system in a minority of participants.

Conclusion
SafeCare is acceptable and useful from caregivers' perspectives in this Canadian sample; the skills-based, simple language delivery and provider relationship were key facilitators. Implementation challenges - material supports, family stability, and perceived intrusiveness should be addressed to improve uptake and equity.

Cost–Benefit of Treatment Foster Care Oregon (TFCO) Versus Residential Care in Illinois(Chor & Oltmans, 2024)

Problem statement
Children with severe emotional/behavioural needs are often placed in costly residential care because community-based therapeutic foster options are limited. States need evidence on whether implementing TFCO (a treatment foster model) yields placement stability and net savings relative to residential care to inform policy and resource allocation.

Intervention
Treatment Foster Care Oregon: intensive, team-based therapeutic foster care model (specialized foster parents, in-home skills training, therapy, case coordination) typically lasting 6–9 months.

Methods
Quasi-experimental cost–benefit study using, contract and payment data. Sample: 52 children who received TFCO and 67 eligible children who remained in or entered residential care, each with less than 2 years of follow-up. Analyses executed in R.

Results
- Over 2 years, TFCO children spent far fewer days in residential care and more days in foster placements compared to the comparison group (residential dominated the comparison group). Differences were statistically significant ($p < 0.001$).
- Adding monetized lifetime benefits produced a substantial net benefit per child (authors report a large positive net benefit).

Conclusion
In this Illinois pilot context, TFCO produced meaningful placement stability in family-based settings and produced sizable short-term cost-savings from the child-welfare agency perspective; combined with monetized long-term benefits, TFCO shows a favourable cost–benefit profile. Authors stress attention to start-up costs, workforce capacity, and caseload management for successful scale-up.

Moving Toward an Evidence-based Family and Community-based Approach to Improve the Lives of Children and Young (Heriot & Kissouri, 2018)**.**

Problem Statement
Child abuse and neglect remain high across New South Wales (NSW), with a sharp over-representation of Aboriginal children in out-of-home care (OOHC). Traditional child protection responses have been fragmented, inconsistent in outcomes and weak in trauma-informed practice. NSW sought to reform the system by embedding evidence-based, family- and community-focused models capable of addressing trauma and preventing OOHC entry.

Intervention
Two intensive, home-based evidence-based interventions were introduced under the *Their Futures Matter reform:*
- **MST-CAN (Multisystemic Therapy for Child Abuse & Neglect):** Home-based trauma and systems-oriented therapy for high-risk families for up to 9 months.
- **FFT-CW (Functional Family Therapy – Child Welfare):** Two-track model for families with substantiated abuse/neglect, addressing substance use, mental illness, and parenting deficits.

Implementation was supported through the Community Development Team (CDT) model, an evidence-based implementation framework emphasising peer-to-peer learning, fidelity, and workforce capacity.

Methods
This article is a policy and implementation analysis, drawing on:
- Program design frameworks
- Prior MST-CAN **(**Multisystemic Therapy for Child Abuse & Neglect**)** /FFT-CW (Functional Family Therapy – Child Welfare) empirical evidence

- Early implementation data from NGOs, commissioning processes, and system-level evaluation planning
- Analysis of barriers (technical, procedural, workforce, and cultural competence) in adopting EBP. Content reflects an interpretive, descriptive methodology rather than empirical statistical testing.

Results

- MST-CAN and FFT-CW showed international evidence of reducing trauma symptoms, substance use, and family conflict, NSW (New South Wales) expected similar outcomes.
- High NGO willingness to adopt the models; however, challenges emerged: workforce readiness (specialised skills, after-hours availability)
    - Maintaining fidelity during scale-up
    - Training and retention demand
    - Cultural relevance for Aboriginal communities
    - Identification of appropriate families.
- **Community Development Team (**CDT) improved peer-to-peer problem solving, accelerated adoption, and strengthened fidelity.

Conclusion

Implementing MST-CAN and FFT-CW as core family preservation models can transform NSW child welfare by delivering trauma-responsive, intensive, home-based supports. However, successful long-term outcomes depend on:

- Strengthening implementation capacity
- Embedding culturally responsive practice
- Using validated outcome tools
- Developing local expertise within NGOs
- Maintaining fidelity and sustainable commissioning structures.

Parent-Training Programs in Child Welfare Services: Planning for a More Evidence-Based Approach(Barth et al., 2005)**.**

Problem Statement

Parent-training is the *primary* intervention used by Child Welfare Services (CWS) to prevent placement, improve parenting, and support reunification. However, the field lacks:

- Systematic evaluation of child welfare–specific parent training
- Evidence-based models designed for CWS families
- Demonstrated effectiveness in reducing re-abuse or improving safety. Most programs used in CWS are unevaluated, inconsistent, and poorly matched to the complex needs of maltreating families.

Intervention

The article reviews multiple parent-training models and categorizes them into evidence-based tiers:

1. **Leading Evidence-Based Programs:**
    - Parent-Child Interaction Therapy (PCIT)
    - Parent Management Training (PMT)
    - Multisystemic Therapy (MST)

    These have strong RCT support but limited testing *specifically* in CWS populations.
2. **Possibly Efficacious but Common in CWS:**
    - Parenting Wisely
    - Project 12-Ways
    - STEP (Systematic Training for Effective Parenting)
    - Nurturing Parent Program

    These have quasi-experimental or single-subject evidence.
3. **CWS Programs:**
    - Classroom-based approaches widely used but lacking evidence.

Methods

A comprehensive narrative review synthesizing:

- Peer-reviewed studies
- NSCAW (National Survey of Child and Adolescent Well-Being) national data
- Unpublished state-level CWS findings
- Program manuals and web resources
- Reviews from mental health, juvenile justice, and education sectors
- Analyses of parent training goals, functions, and evaluation gaps. The authors classify programs by evidence strength and relevance to CWS needs.

Results

- No parent-training program meets full APA/Cochrane standards for CWS populations, due to lack of RCTs (Randomised Control Trials) directly targeting child-welfare-involved families.
- Leading EBPs show strong potential but require adaptation (PMT, PCIT, MST).
- Many widely used programs lack rigorous evidence despite popularity.
- Child Welfare Service families differ significantly from mental-health samples: higher rates of trauma, substance use, domestic violence, poverty, and low motivation requiring intensive, flexible, home-based models.
- High dropout rates (up to 80% in some programs) limit effectiveness.
- NSCAW data show high heterogeneity in parenting problems across maltreatment types and age groups, suggesting need for tailored interventions.

Conclusion

Child welfare urgently needs healthy, evidence-based, and well-adapted parent-training models**.** The authors recommend:

- Adapting strong EBPs (PCIT, PMT, MST) for CWS contexts
- Increasing randomized trials with maltreating families
- Addressing co-morbidities (mental health, substance use)
- Using validated assessment tools
- Supporting fidelity, engagement, and workforce training.

Reunifying Successfully: A Systematic Review of Interventions to Reduce Child Welfare Recidivism (LaBrenz et al., 2020)**.**

Problem statement
A substantial proportion of children reunified with biological parents, re-enter foster care or are re-referred for maltreatment (risk highest in the first 12–18 months). Despite policy emphasis on reunification, the evidence bases about interventions that reduce recidivism after reunification is thin, scattered, and practically weak. LaBrenz et al. set out to synthesize evidence on interventions that increase *successful reunification* (no re-entry / no re-referral).

Intervention
The review considered a range of post-reunification and reunification-support interventions evaluated in the U.S. after ASFA (1997). Interventions in the included studies encompassed: Family (Treatment) Drug Courts / Family Dependency Treatment Courts (FDTC/FTDC), recovery coaching, intensive reunification services (family preservation models), and enhanced legal representation, and Parent Partner / mentorship programs.

Methods
PRISMA-aligned systematic review with searches across five academic databases, government/educational sites, and outreach to state agencies (searches repeated 2018–2019). Inclusion: U.S. studies post-1997 with biological parents of reunified children, experimental or quasi-experimental design, and outcomes measuring re-entry or re-referral. From 216 records screened, 10 studies (N = 7,278 parents) met criteria. Risk of bias was assessed using the Cochrane tool. Effect sizes (risk ratios) were calculated where data permitted.

Results
- Mixed findings across 10 studies: six reported ≥1 positive outcome, three found no differences, one found worse outcomes for the intervention group.
- FDTC/FTDC (Family Treatment Drug Courts / Family Dependency Treatment Courts) studies showed inconsistent effects: some sites reported reduced re-entry/recidivism (Singh et al., 2023), while larger multisite analyses found no significant reductions or even higher odds in some comparisons.
- Parent Partner and recovery coach models showed some short-term reductions in reentry (significant reduction at 12 months for Parent Partner; non-significant at 24 months).
- Many studies had high selection bias (9/10 quasi-experimental), inconsistent reporting of effect sizes, small samples at times, and variable follow-up windows; heterogeneity in interventions and outcomes generalization.

Conclusion
Evidence for interventions that reliably reduce reunification recidivism is limited and mixed. Some models (court-based, mentorship/recovery support, intensive follow-up) show promise in specific contexts, especially for substance-involved families, but overall methodological limitations (lack of RCTs, high selection bias, small samples, inconsistent

outcome measurement) prevent firm recommendations. More rigorous, replicated trials with standardized outcomes and longer follow-up are needed.

Investigating Supervision and Leadership Practices to strengthen EBP Implementation in the Child Welfare System: A Case Study Analysis (Singh et al., 2023)**.**

Problem Statement

Evidence Based Practice implementation in Child welfare depends on strong supervision and leadership. Still supervision often lacks active learning strategies (behavioural rehearsal, observation, feedback) and suffered from high caseloads, weak coordination with the leadership, undermining sustainment of Evidence Based Practice. This Study examines how supervisor leadership and supervision quality affect EBP implementation in R3 supervisor focused strategies i.e., Reinforce, Relationship and Role.

Intervention

R3(Reinforce, Relationship and Role) is a supervisor-targeted implementation strategy that trains supervisors to use three reinforcement strategies (reinforce effort, relationships/roles, and small steps) and four principles from evidence-based parenting (strength-focused language, notice normative behaviour, observe & reinforce, use positive affect). R3 is intended to be demonstrated in supervision so supervisors then support caseworkers to use R3 with families. Implementation included training, booster sessions, coaching, fidelity monitoring, and a certification process.

Methods

Mixed-methods multiple-case study nested in a Hybrid Type II trial across four regions (stepped-wedge rollout). Quantitative measures used (implementation Leadership Scale, fidelity metrics) and longitudinal semi-structured interviews conducted with supervisors (up to five interviews each). Supervisors were stratified by implementation leadership scores (higher vs lower); purposive random sampling selected 10 supervisors per category for intensive case study analysis. Qualitative directed content analysis and longitudinal coding identified barriers, facilitators, and themes; fidelity and certification data supplemented interpretations.

Results

- Strong supervision leadership, engaged coaching, and attainment of R3 certification were associated with supervisors observing infusion of R3 into caseworker–family interactions. Many supervisors with higher leadership scores achieved certification within 12 months and reported observed caseworker use of R3.
- Key facilitators: positive coach–supervisor relationships, active coaching engagement, a supportive learning climate, and perceived compatibility of R3 with existing supervisory philosophy.
- Key barriers: high caseworker turnover, heavy caseloads, limited upper-management engagement (disconnect between external R3 support and internal leadership), and competing supervision priorities that reduced time for skills coaching.

- Specialty supervisors (non–case-carrying) and supervisors with lower leadership scores less often achieved certification and reported less infusion.

Conclusion

Supervisor leadership and quality supervision (supported by ongoing coaching and fidelity feedback) are critical levers to achieve EBP infusion at the caseworker–family level. Implementation strategies that target supervisors (training, coaching and fidelity monitoring) show promise, but sustainment requires alignment with mid/top leadership, manageable caseloads, and structures that limit turnover and competing demands. Investing in supervisor capacity (coaching, certification pathways) is a pragmatic pathway to strengthen EBP delivery in child welfare.

Discussion

Evidence across the reviewed studies emphasizes that evidence-based practices (EBPs) play a critical role in producing measurable improvements in child welfare services. The body of evidence outline that evidence-based practice in child welfare can change family functioning, child safety reduce risks and improvise system outcomes. Each intervention Safe Care, Treatment Foster Care Oregon (TFCO), Multisystemic Therapy for Child Abuse & Neglect (MST-CAN**),** Functional Family Therapy – Child Welfare (FFT-CW), parent partner models, supervision-based strategies like R3 **(**Reinforce, Relationship and Role) produced effective change because of their evidence practice components such as structured curriculum, monitoring, coaching, active skill training and trauma informed frameworks.

Intervention focused evidence-based practice in research demonstrates strong potential to improve child safety and wellbeing when models are implemented with fidelity, SafeCare, improved caregiver knowledge, routines, health decision making and safety practices, demonstrating high acceptability among families (Gallitto et al., 2018). Treatment Foster Care Oregon (TFCO) produced considerable reduction in residential care days, increased time in family-based placements, and approximately $51,058 cost saving per child in two years of duration. These results were possible because of TFCO's core evidence-based practice EBP components such as intensive foster parent training, structured youth skill coaching, cross disciplinary teamwork, and daily fidelity tracking. Agencies reported that increase stability and reduced high cost payments possible due to well-structured routines (Chor & Oltmans, 2024).

In the child welfare systems, the introduction of MST-CAN (Multisystemic Therapy for Child Abuse & Neglect) in New South Wales revealed how EBP can reform traditional service delivery by shifting practice towards trauma informed, home-based and family engaged models **(**Heriot & Kissouri**,** 2018**)**. These findings collectively confirm that evidence-based practice (EBP) can catalyse significant practice change especially targeting the root causes of maltreatment through structured, skill based, and relationship focused approaches. MST-CAN and FFT-CW improved family engagement, reduced crisis behaviour and increased stability by addressing trauma, substance use, mental illness and family conflict.

The systematic review shows mixed and inconsistent efforts for interventions proposed to reduce re-entry after reunification. Family drug courts, recovery coaches and parent partner models showed promising but inconsistent efforts. Programme with stronger evidence-based practice elements structured recovery coaching, treatment coordination, and frequent contact demonstrated greater short-term reductions in re-entry while programs lacking fidelity structures or consistent supervision did not. The variability in outcomes underscores that reunification is a high-risk phase requiring high intensity, evidence structured interventions rather than loosely defined services (LaBrenz et al., 2020).

The R3 **(**Reinforce, Relationship and Role) models demonstrates that supervisor focused reinforcement strategies can strengthen evidence-based practice infusion into daily practice but only when supervisors receive meaningful coaching and operate within supportive organisational structure. Without leadership alignment, manageable caseloads, and reduced turnover, even high-quality evidence-based practice struggle to produce consistent outcomes (Singh et al., 2023).

The evidence suggests several important implications that EBP influence child welfare outcomes but the magnitude of the change depends on implementation quality, organisational readiness, and alignment between intervention models and system level leadership. Evidence-based practices are reshaping child welfare by offering structured, trauma-informed, skill-building interventions that improve family functioning and reduce system involvement. However, their impact is constrained by gaps in rigorous research, inconsistency in implementation, and systemic workforce and leadership challenges. Future research must strengthen causal evidence, focus on system-level implementation supports, and address cultural relevance and long-term sustainability. Only through quality intervention and healthy implementation systems can the full potential of evidence-based practice realised in child welfare.

Conclusion

The evidence is clear in this systematic review that evidence-based practice plays an essential role in transforming child welfare system. The literature consistently demonstrates that well tested interventions such as SafeCare, Treatment Foster Care Oregon (TFCO), MST-CAN, FFT-CW and structured parent training models can significantly improve child safety and reduce maltreatment, strengthen parenting skills and enhance behavioural and emotional wellbeing. The systematic reviews indicate an increasing need for the use of randomized controlled trials, quasi-experimental designs, mixed-methods evaluations reflecting a maturing scientific foundation. Qualitative research complements these approaches by highlighting caregiver perspectives, engagement barriers, cultural fit, and contextual challenges that shape real-world outcomes. Together, these methodologies illustrate that effectiveness in child welfare intervention.

Despite substantial progress, the 27-article review reveals persistent gaps such as limited long-term follow-up, insufficient research in culturally diverse or low-resource settings, and underdeveloped cost–benefit evidence for many interventions. Moreover, the need to adapt EBPs for families with complex trauma, substance use, and chronic disadvantage

remains urgent. These gaps highlight opportunities for future research focused on sustained outcomes, equity-oriented implementation, and culturally grounded adaptations in child welfare, especially in the Indian context.

Overall, the synthesis of these studies demonstrates that evidence-based practice is not only feasible but essential for delivering effective, equitable, and accountable child welfare services. By integrating rigorous evidences, practitioner expertise, and family engagement, EBP offers a pathway toward a more responsive and outcome-driven system. Continued efforts to strengthen methodological accuracy, implementation infrastructure, and cultural relevance will be vital to ensuring that all children and families benefit from interventions proven to promote safety, stability, and long-term well-being. At this background, it is authentic to state that the Indian Child Welfare System needs reform in designing need-based services for children and families, empowering them prevent the need for the institutional care services. On the other hand, the institutional care services demand reforms in designing quality care services, evaluating the services and outcomes of the delivery system.

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South Asian Journal of
Participative Development

Vol.25, No.2 (Spl.), July - Dec. 2025
ISSN No: 0976-2701

Effectiveness of the Experiential Learning Method to Improve Kannada Language Skills among School Children in Ballari Urban: An Experimental Study

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Abstract

This paper investigates the effectiveness of the experiential learning Method as a strategy for Language Skills development of school children in Ballari Urban. Learning a language is a child's first experience with learning. For school-age children, language proficiency is essential since it affects many facets of their academic growth and achievement. Strong language skills also promote self-expression, creativity, and cultural awareness. The sampling of this study consists of 32 subjects from the Government Higher Primary School, Gandhinagar in Ballari Urban. The study was guided by two key objectives: (1) to know the proficiency levels of Kannada language skills among boys and girls in the experimental group, and (2) to explore the contribution of the experiential learning method on the development of Kannada language skills among the subjects. Employed an experiential learning approach during the intervention period and conducted an experimental study with a single group pretest and posttest design. Data were gathered using the Kannada language achievement test and a student demographic questionnaire; statistical analysis was performed using paired sample t-test. The results showed a significant difference between pre and post test phase i.e. experiential learning method produces a statistically significant difference in the mean scores before and after the intervention. In this connection, the study concluded that the use of experiential learning has resulted in a significant increase in student performance in terms of reading and writing skills.

Key Words: Experiential Learning Method, Mother Tongue, Language Skills, School Children, Preparatory Stage, Experimental Study

Introduction

Education becomes joyful when it is incorporated with playful activities and games. These activities should align with lesson objectives and enhance comprehension. Education is a comprehensive process that fosters not only personal growth but also the

enriching development of society and the nation (Alur. P.R., & Yerriswamy. V.,2023). In Karnataka, the *Nali-Kali* method - a child-centered approach designed for students in grades 1 to 3, was introduced in 1995–96 with the support of UNICEF. Since then, it has been adopted by all government schools in the state. To assess ongoing progress, the researcher selected 5th-grade subjects and employed the experiential learning method through the Six Thinking Hats strategy to make learning enjoyable.

This study delves into the efficacy of experiential learning methods in nurturing language skills among school children in Ballari Urban. Language proficiency is fundamental for social interaction and academic achievement. By utilizing six thinking hats strategy (Bono, E. D., 2008) experiential learning, which engages learners through hands-on experiences, this research aims to assess its impact on language skill enhancement. The context of Ballari Urban provides a diverse setting for understanding the applicability and efficacy of such methods.

This study recognizes the impact of experiential learning on language development. Experiential learning is a student-focused approach which supports and engages the learners to do, to reflect and to make their learning process happen (Ha Le-Thi et al, 2024). The study's insights can help educators and policymakers optimize language acquisition strategies, promoting a more inclusive and productive learning environment for a variety of student populations. Through the implementation of experiential learning methods, educational institutions can improve language proficiency and foster student involvement, leading to more efficacious language teaching approaches and enhanced academic achievements.

Statement of the problem

Exploring the Efficacy of Experiential Learning Method to improve Language Skills among School Children in Ballari Urban

Significance of the study

Language competency is necessary to attain academic success in all subjects. It covers listening, speaking, reading, and writing. Every child should have a good competency level in language because it helps children to understand instructions, read textbooks, and effectively communicate with others.

Concept of language skills

Language is a fundamental aspect of human cognition and culture, playing a crucial role in various aspects of daily life, including education, work, and interpersonal relationships. Wikipedia defined as “Language is a structured system of communication that consists of grammar and vocabulary” (Wikipedia, 2019). The four main language abilities are listening (L), speaking (S), reading (R) and writing (W). While listening and speaking are oral language skills, reading and writing are written language skills (Fig.1). We can explain our self exactly and effectively with the help of these language skills. These foundational language abilities help us learn how to listen attentively as well as how to communicate effectively. The development of each of these skills is significant for the language and literacy development of the child.

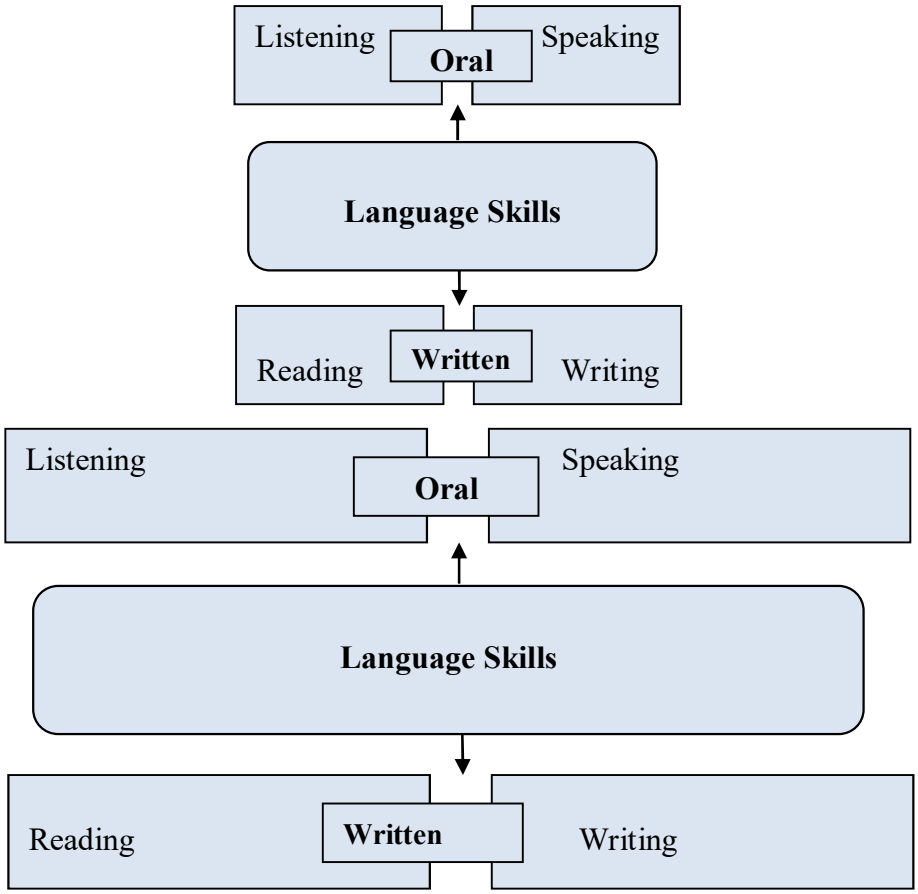


Fig.1Source:IGNOU https://egyankosh.ac.in/bitstream/123456789/99738/1/Unit-1.pdf)

Review of Literature

Ha, L. T. et. al., (2024) investigated a sample comprising 22 English major students aged 18-19 years old to assess the effectiveness of experiential learning in teaching and learning English speaking skills through provided learning activities in four phases: prepare, do, reflect, and apply. They found that the experiential learning method improves not only students' speaking skills but also soft skills such as teamwork, adaptability, problem-solving, and interpersonal skills.

Hasheem (2021) conducted a study to assess the effectiveness of the Six Thinking Hats strategy in enhancing English language speaking skills among general diploma students. The study employed a quasi-experimental design with a sample size of 32 students. Over a period of 3 months, classes were conducted using the Six Thinking Hats strategy, with sessions held for 2 hours per week. The students reported enjoying the learning process using this method. The study findings indicated that the strategy significantly enhanced both the students' speaking skills and their critical thinking abilities.

Ugyen, P., & Dumcho, W. (2020) conducted a study aiming to examine the effectiveness of the Six Thinking Hats strategy on the development of writing skills and creativity. The study employed a quasi-experimental research design with a sample size of 65 students, distributed unequally between the control group (34 students) and the experimental group (31 students). Homogeneity was confirmed through a pre-test t-test, which revealed no significant mean difference between the groups. The study observed that students in the experimental groups were motivated by the Six Thinking Hats strategy, as it facilitated creativity, imagination, and thoughtfulness before answering questions in writing.

S, A., (2019) examined the effect of experiential learning on students' speaking skills and observed a significant improvement. The experimental group showed a 16% increase in high speaking skill compared to the control group's 2%. Hani, U. et al., (2017) conducted a factorial design study involving 48 students, with an equal distribution of 24 students in each group. The researchers utilized the Student Oral Language Observation Matrix (SOLOM) to assess speaking skill achievement and evaluated critical thinking levels using the Cornell Critical Thinking Test level X (CCTT-X). The results indicated that the experimental group showed greater improvement compared to the control group. Furthermore, the implementation of Six Thinking Hats successfully encouraged students to achieve better speaking skills than those who were not exposed to it.

Al-Khataybeh, M., & Salem, N. (2015) conducted a study aimed at investigating the effect of the Six Thinking Hats method on the development of English as a Foreign Language (EFL) skill among eleventh-grade students. They selected a sample of 50 students from a population of 344, dividing them into two groups: an experimental group consisting of 24 students and a control group consisting of 26 students. Validity was established through a jury of TEFL experts, and reliability was assessed using statistical tests in SPSS. The results of the study revealed a statistically significant difference at the .05 level between students' achievements in writing skills as a result of using the Six Thinking Hats method compared to the conventional method.

Dhanapal, S., & Wern Ling, K. T. (2014) attempted to apply the concept of the Six Thinking Hats to understand its reasons and extent of application in the English language classroom. Their study aimed to resolve the factors affecting the application of the Six Thinking Hats. The findings indicated a positive influence on learning in the English language classroom. Consequently, they strongly recommended adapting the application of the Six Thinking Hats to increase effectiveness, suggesting its implementation from the early levels of education to a whole school approach.

Knutson, S. (2003) explored the issues regarding experiential learning in the acquisition of a second language in the classroom. The aim was to examine the relationship between theoretical foundations and their incorporation across experiential learning phases. Additionally, the study aimed to understand the relationship between motivation, investment, experiential curriculum, and their potential solutions, ultimately recommending experiential learning for the empowerment of students.

Research Methodology

Variables

1. Independent Variable : Experiential learning method
2. Dependent Variable: Language skills i.e. reading skill and writing skill

Objectives

1. To know the proficiency levels of kannada language skills among boys and girls in the experimental group
2. To explore the contribution of experiential learning method on the development of kannada language skills among the subjects

Hypotheses

1. The experiential learning method has no significant contribution in upgrading boys and girls from lower levels to upper levels
2. The experiential learning method has no significant impact on kannada language skills i.e. reading and writing skills among the subjects

Research design

The current study employs single subject group with pre and post-test experimental research design, with the experimental group consisting of the Government Higher Primary School of Gandhinagar in Ballari Urban.

Sampling size

The present study's sample size consists of 32 subjects who are studying in the 5^{th} Standard in Government Higher Primary School of Gandhinagar.

Inclusion criteria

This study included only 5^{th} standard school children from Government Higher Primary School Gandhinagar

Exclusion criteria

Other Government schools, Government aided schools and Private Schools in Ballari Urban are excluded

Methods of data collection;

General Information: Demographic details of the subjects were collected through the interview schedule.

Achievement test: The achievement test was conducted twice (Pre-test and Post-test) for the experimental group in Kannada. Here, the researcher wanted to test reading and writing skills through this test, which was constructed by the researcher and research supervisor based on department guidelines as well as expert suggestions. It consists of 17 questions with a total of 25 marks, allocated as follows: 24% for knowledge, 36% for comprehension, 32% for expression, and 8% for appreciation.

Secondary data: Sources such as books, internet sources, journals, and newspapers were utilized for secondary data of the present study.

3.1 Reliability of the tests

Reliability Statistics		Level of reliability
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Very reliable (>.80 – 1.00)
.842	.853	

Reliability Statistics indicate a high level of reliability with Cronbach's Alpha values of .842 and .853, both surpassing .80, suggesting the measures are very reliable (>.80 – 1.00).

Steps of intervention

The intervention was structured using David Kolb's experiential learning theory and Edward de Bono's Six Thinking Hats strategy. These stages were adopted during the intervention by the researcher.

1. **Lead In:** This stage sets the context and generates interest in the topic. It could involve a brief introduction, a relevant story, or a thought-provoking question.
2. **Explain:** In this stage, the instructor provides foundational knowledge or concepts related to the topic. They clarify key terms and concepts to ensure understanding.
3. **Demonstration:** Here, students observe how the concepts are applied in practice. This could involve demonstrations, simulations, or real-life examples.
4. **Practice:** Students engage in hands-on activities to apply what they've learned. This stage provides opportunities for active experimentation and skill development.
5. **Elaboration:** This stage encourages students to deepen their understanding by relating the concepts to their own experiences or exploring related topics in more depth.
6. **Conclusion:** The intervention concludes with a summary of the major ideas and insights. Students consider their learning and possible applications.

By structuring the intervention using these stages, students engage in a comprehensive learning experience that incorporates both theoretical knowledge and practical application, aligning with Kolb's experiential learning cycle.

Data Analysis and Interpretation

Table 4.1 Gender wise Distribution of subjects

Distribution	Particulars	Frequency	Percent
Gender	Boys	13	40.6
	Girls	19	59.4
	Total	**32**	**100.0**

The table 4.1 reveals the gender distribution in this study. There were 13 subjects (40.6%) are boys and 19 subjects (59.4%) are girls. This indicates that more representation of girls in the sample compared to boys.

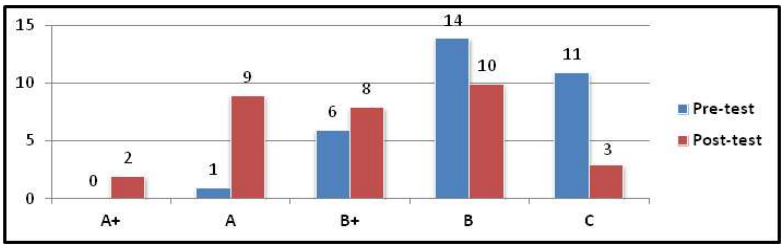
Table 4.2 Results among boys and girls in pre and post test

Grade Statement (Marks)	Pre-test phase			%	Post-test phase			%
	Boys	Girls	Total		Boys	Girls	Total	
A+ Very Good (22.5-25)	0	0	**0**	0	1	1	**2**	6.25
A Good (17.5-22)	1	0	**1**	3.13	4	5	**9**	28.13
B+ Moderate (12.5-17)	2	4	**6**	18.75	3	5	**8**	25.00
B Low (7.5-12)	6	8	**14**	43.75	5	5	**10**	31.25
C Extremely Low (< 7)	4	7	**11**	34.37	0	3	**3**	9.37
Total	**13**	**19**	**32**	**100**	**13**	**19**	**32**	**100**

Analysis:
The table 4.2 exhibits the Gender wise trends about effectiveness of the experiential learning intervention using the Six Thinking Hats strategy.

In the pretest phase: The majority of students were showed their performance as lower categories. Specifically, 43.75% of students were in the Low (B) range and 34.37% were in the Extremely Low (C) range. Together, this accounted for nearly 78.12% of the total group. Only 3.13% of students reached the Good (A) level, and none achieved Very Good (A+). This distribution clearly shows that before the intervention, both boys and girls were predominantly at lower performance levels.

Posttest Phase: After the experiential learning intervention, there was a good improvement. The proportion of students in the Extremely Low (C) category dropped sharply to 9.37%, while the Low (B) group reduced to 31.25%. At the same time, higher categories saw significant gains: Good (A) rose from 3.13% → 28.13%, and Very Good (A+) emerged at 6.25%. This indicates that a substantial number of students moved upward from lower to higher levels.



Graph 1.2a

Interpretation
The above graph 1.2a tells us the Gender-wise improvement. Application of the Six Thinking Hats strategy appears to have successfully enhanced student's reading and writing skills, leading to better performance in the posttest. The strategy effectively reduced the number of students in the lowest performance category and facilitated their

transition into higher grades. Here both the boys and girls are benefited from intervention. Hence, the null hypothesis is rejected. It means that, the experiential learning method had a significant contribution in upgrading student's performance levels across both genders.

Table 4.3 Language skill (Reading) scores among Pretest and Posttest of Experimental Group

N= 32	Mean	Std. Deviation	Mean Difference	Obtained 't' value	df	Sig.	Table value .05	.02	.01
Pre	5.203	2.0551	-2.26563	-5.896	31	.000*	2.040	2.453	2.744
Post	7.4688	2.33465							

(Paired samples test, *Significant at .01 significance level)

The table 4.3 compares the language skill (reading) scores of the experimental group the pre-test and post-test assessments. In the pre-test, the mean language skill (reading) score was 5.203 with a standard deviation of 2.0551. In the post test, the mean score significantly increased to 7.4688 with a standard deviation of 2.33465 in the post-test. Namely, the mean difference between pre-test and post-test scores was -2.26563 and the obtained't' value was -5.896. The obtained't' value is greater than the critical value at a significance level of .01 (2.744), indicating a significant difference between pre-test and post-test scores.

Interpretation

The analysis indicates that the intervention had a statistically significant positive effect on the language skill (reading) scores of the experimental group. Based on these findings, it can be concluded that the intervention implemented in the experimental group effectively enhanced the language skill (reading) abilities of the subjects.

Table 4.4 Language skill (Writing) scores among Pretest and Posttest of Experimental Group

N=32	Mean	Std. Deviation	Mean Difference	Obtained 't' value	df	Sig.	Table value .05	.02	.01
Pre	4.094	2.4804	-3.43750	-7.940	31	.000*	2.040	2.453	2.744
Post	7.5313	3.56492							

(Paired samples test, *Significant at .01 significance level)

The table 4.4 compares the language skill (writing) scores of the experimental group between the pre-test and post-test assessments. In the pre-test, the mean language skill score for writing was 4.094 with a standard deviation of 2.4804. In the post test, the mean score significantly increased to 7.5313 with a standard deviation of 3.56492 in the post-test. The mean difference between pre-test and post-test scores was -3.43750. The obtained 't' value was -7.940. This value is greater than the critical value at a significance level of .01 (2.744), indicating a significant difference between pre-test and post-test scores.

Interpretation

The analysis suggests that the intervention had a statistically significant positive effect on the language skill (writing) scores of the experimental group. Based on these findings, it can be concluded that the intervention implemented in the experimental group effectively enhanced the language skill (writing) abilities of the subjects. These results provide empirical support for the efficacy of the intervention and underscore its importance in improving writing skills among the subjects.

Table 4.5 Language scores among Pretest and Posttest of Experimental Group

N=32	Mean	Std. Deviation	Mean Difference	Obtained 't' value	df	Sig.	Table value		
							.05	.02	.01
Pre	9.297	4.1384	-5.70313	-8.877	31	.000*	2.040	2.453	2.744
Post	15.0000	5.36115							

(Paired samples test, *Significant at .01 significance level)

Analysis

Table 4.5 depicts that the paired samples t-test results, a significant improvement in Kannada language scores from the pretest (M = 9.297, SD = 4.1384) to the posttest (M = 15.000, SD = 5.36115) among the experimental group (N = 32). The mean difference of -5.70313 indicates an increase in scores after the intervention. The obtained t-value of -8.877 with 31 degrees of freedom is statistically significant at the 0.001 level (p = .000), exceeding the critical table values for .05, .02, and .01 levels of significance.

Interpretation

The results indicate that the experiential learning intervention significantly enhanced subject's language performance. The high t-value and significance level confirm the effectiveness of the method in improving language skills. The large mean difference reflects substantial progress, justifying that the intervention addressed key learning challenges and fostered better engagement and understanding among the subjects.

Table 4.6 Effect size analysis of Experimental Group on Kannada Language Skills

Sl. No.	Abilities	Pretest Mean (SD)	Posttest Mean (SD)	Mean Difference	Cohen's d	Interpretation
1	Reading	5.20 (2.06)	7.47 (2.34)	2.27	1.03	Large
2	Writing	4.09 (2.48)	7.53 (3.56)	3.44	1.12	Large
3	Kannada	9.30 (4.14)	15.00 (5.36)	5.70	1.19	Large

(Note. Cohen's d values were calculated using pooled standard deviations. Interpretation follows Cohen's (1988) guidelines: 0.2 = small, 0.5 = medium, 0.8+ = large effect.)

Analysis

The effect size analysis was conducted to evaluate the impact of the experiential learning method on Kannada language skills (reading and writing) within the experimental group. Pretest and posttest mean, standard deviations, mean differences, and Cohen's d values were calculated for each ability.

As shown in Table 1.6, In Reading skill: The mean score increased from 5.20 (SD = 2.06) in the pretest to 7.47 (SD = 2.34) in the posttest, yielding a mean difference of 2.27. The effect size (Cohen's d = 1.03) indicates a large effect, suggesting substantial improvement

in reading skills. In Writing skill: The mean score rose from 4.09 (SD = 2.48) to 7.53 (SD = 3.56), with a mean difference of 3.44. The effect size (Cohen's d = 1.12) also reflects a large effect, demonstrating strong gains in writing ability. In Kannada (Overall): The combined Kannada language score improved from 9.30 (SD = 4.14) to 15.00 (SD = 5.36), with a mean difference of 5.70. The effect size (Cohen's d = 1.19) represents a large effect, confirming significant overall enhancement in Kannada language proficiency.

Interpretation

The results show that the experiential learning method had a strong positive effect on students' Kannada language skills. In reading, writing, and overall Kannada proficiency, the effect sizes were all above 1.0, which is considered as large effect. This means the improvement was not only statistically significant but also meaningful in practice, leading to clear gains in students' abilities. Therefore, the null hypothesis is rejected, and the alternative hypothesis is accepted i.e. experiential learning helped students move from lower to higher performance levels in Kannada language skills.

Findings

The study clearly shows that the experiential learning method using the Six Thinking Hats strategy was effective in improving Kannada language skills.

- Gender distribution: Girls (59.4%) were more represented than boys (40.6%), but both groups benefited equally from the intervention.
- Pretest results: Most students were in lower categories, with 43.75% in Low (B) and 34.37% in Extremely Low (C). Only 3.13% reached Good (A), and none achieved Very Good (A+). (Graph 1.2a)
- Posttest results: Performance improved significantly. Extremely Low (C) dropped to 9.37%, Low (B) reduced to 31.25%, while Good (A) rose to 28.13% and Very Good (A+) appeared at 6.25%.
- Language skills: Paired samples t-tests showed significant gains in reading ($M = 5.20 \rightarrow 7.47$, $t = -5.896$, $p < .01$), writing ($M = 4.09 \rightarrow 7.53$, $t = -7.940$, $p < .01$), and overall Kannada proficiency ($M = 9.30 \rightarrow 15.00$, $t = -8.877$, $p < .01$).
- Effect sizes: Cohen's d values for reading (1.03), writing (1.12), and overall Kannada (1.19) were all large, confirming that the experiential learning method had a strong positive impact on student's Kannada language skills. These improvements were both statistically significant and educationally meaningful.

Discussion

The present study examined the effectiveness of the experiential learning method, implemented through the Six Thinking Hats strategy, in enhancing Kannada language skills among students. The results consistently demonstrated significant improvements in reading, writing, and overall language proficiency, providing strong evidence for the effectiveness of the intervention.

The pretest results revealed that most students were concentrated in the lower performance categories, highlighting the initial challenges in Kannada language learning. However, the posttest results showed a drastic shift, with fewer students in the lowest categories and more students achieving higher grades. This upward movement indicates that the intervention successfully facilitated learning and skill development. The paired

samples t-test results confirmed that the improvements were statistically significant across all domains. Reading and writing skills showed measurable gains, while overall Kannada proficiency reflected substantial progress. These findings revealed that experiential learning strategies can address key learning difficulties by engaging students in active, reflective, and creative processes.

The effect size analysis further reinforced the practical significance of the intervention. Cohen's d values for reading (1.03), writing (1.12), and overall Kannada proficiency (1.19) all exceeded the threshold for a large effect, indicating that the improvements were not only statistically significant but also educationally meaningful. This demonstrates that experiential learning had a strong impact on students' abilities, enabling them to move from lower to higher performance levels. These findings align with previous research that emphasizes the value of experiential learning and creative thinking strategies in language education. Studies such as Al-Khataybeh and Salem (2015) and Dhanapal and Wern Ling (2014) have shown that the Six Thinking Hats method enhances writing and classroom engagement. The present study adds to this body of evidence by confirming similar benefits in the context of Kannada language learning.

Conclusion

The study concludes that the experiential learning method, implemented through David Kolb's theory and Edward de Bono's Six Thinking Hats strategy, significantly enhanced the academic performance and language skills of the subjects. Statistical analysis demonstrated significant improvements in reading, writing, and overall language scores from pre-test to post-test, with all results showing high significance at the .01 level. Furthermore, the intervention effectively transitioned students from lower to higher performance levels, reducing the number of low achievers and increasing those in higher categories. These findings validate the efficacy of experiential learning as an innovative teaching approach to foster critical thinking, engagement, and meaningful learning outcomes among students.

The Six Thinking Hats strategy proved to achieve significant development on the learner's language skill, and made out-of-the-box teaching a reality (Hasheem L. I. F., 2021). Moreover, Experiential learning method can help to optimize subject's language learning in an engaging and enjoyable manner, ultimately benefiting their overall academic achievement and lifelong learning.

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South Asian Journal of Participative Development
Vol.25, No.2 (Spl.), July - Dec. 2025
ISSN No: 0976-2701

Intelligent Tutoring System – Potential Ai for Inclusive Education

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Abstract

'No Child Should Be Left Behind (NCLB)' advocates the mandate of UNICEF, presidential administration by George Bush, to bridge the gap and promote equitable learning opportunities for all the children irrespective of their differences. This forms the vital part of Indian Legislation 'Right to Education Act'. Intelligent Tutoring System (ITS) in domain of AI, can be at the service of the learner 24X7, providing the ease of learning at own space, pace and place supporting education on-demand. The study focuses on the effectiveness of ITS on the academic performance of the learners with differences. It adopts True-Experimental method. The sample of 30 students of grade11 was randomly selected from the class of 35 and divided into two equivalent groups (Experimental and Control) by matching pre-test score. Mann-Whitney test confirmed the equivalence of the groups. Two sub topics 'Surface Tension' and 'Capillarity' were taught to both groups using the traditional teaching method; experimental group using ITS in complement. Data collected through post-test on completion of the topics was analyzed using t-test. Results show calculated t-6.5061>critical t-2.048 for df=28, with P<0.0001 at 95%confidence level highlighting extremely statistically significant difference in the mean post-test score of experimental and control group, strongly indicating the efficiency and effectiveness of using ITS in learning. The t-value also indicated no significant difference in the mean post-test score of girls-boys and general-OBC and SC students using ITS, proving the effectiveness of ITS irrespective of the gender and cast differences.

The study builds strong evidence for use of ITS for inclusivity, supportive learning and enhancing teacher's potential in achieving the learning outcomes irrespective of the individual differences, providing insights to the stakeholders to plan and design the curriculum so as to leverage the AI's potential in the form of ITS in the education positively.

Key Words: Artificial Intelligence, Intelligent Tutoring System (ITS), Individual Differences, Achievement

Introduction

The National Education Policy 2020 strongly suggests the equitable education throughout the nation. No child should be deprived of the opportunity of learning because of any differences. Therefore, the policy proposed the classes to be inclusive and teaching to be

adapted to the learning style and pattern of the child. No individuals are similar and therefore teaching has to be offered in multiple ways using multimodal techniques. Present development in the science, research and technology can come to rescue if integrated ethically and meaningfully in traditional teaching. Perpetual refining of the artificial intelligence can largely supplement the traditional teaching by empowering the teachers to cater the teaching to individual need (UNESCO).

Each child being unique in its ability and intellect, the potential of traditional human teacher needs to wrestle to fulfill the individualized need. Artificial Intelligence therefore, shoulders the responsibility of supporting the learner on demand. The branch of artificial intelligence which specifically deals with the development in education (AIED) promotes the use of AI in various ways depending on its need. The features of AI such as Personalized learning, Automated Administration, Automated Assessment, Virtual Assistance and 24x7 guidance to the learner by Intelligent Tutoring System can largely contribute in letting the learner equitable opportunity to learn irrespective of difference in their gender, cast, class, economic status, demographic location, learning habits and abilities Morandín-Ahuerma (2024).

This experimental study is an attempt to investigate the effectiveness of Intelligent Tutoring System (ITS) in supporting the learner irrespective of the differences. The paper provides the concrete base and proof for supportive role of ITS in inclusivity.

Objectives of the Study

To find the effectiveness of Intelligent Tutoring System on the academic performance of the diverse learners.

Review of related Literature

Kestin et al. (2025), in the study conducted to investigate the role of AI tutoring in learning gain and learner's perceptions showed that AI tutoring can assist the learner with homework, offer guidance and provides remedial for the slow learners. The learners perceived the learning engaging, motivating, enjoying leading to growth in mindset with the help of AI tutor. In addition, the learning with AI tutor is self-paced supporting inclusivity.

RIZVI (2023)In the review investigated the potential of AI-Powered Tutoring Systems for the adaption to the individualized need and personalized guidance. The comprehensive review upholds the widespread impact of AI enabled tools, but also recommended rigorous testing and assessing the use of AI integration in education as the framework and systems are still in its experimental stage.

Baillifard et al. (2025), AI tutor has the potential to provide the personalized learning experience personalized to individual need and abilities in learning sciences and addressing the challenges in implementing effective strategies thereby supporting the inclusivity.

Sedlmeier (2001) mentioned that ITS can be used to provide individualized sophisticated instructional advice far better than CAI in par with good human teacher. ITS can provide

customized instructional interventions tailored to the strength, weaknesses and the level of knowledge of the learner.

Shute & Zapata-Rivera (2010) in the chapter mentioned that ITS has the intelligence to track the learners work, adjust feedback and provides the hints while learning. The software has the potential to collect the cognitive as well as non-cognitive data of the learner in student model and infer about the strength, weaknesses and abilities of the learner and can suggest the additional work to achieve the desired learning outcomes. Gomes (2024) ITS integration in education enable to analyze data and tailor the learning experiences in diverse educational settings empowering learner in personalized learning journey.

Research Questions

1. Is there any difference in the academic achievement of the learners learning by using ITS and learners learning by traditional way of remedial learning.
2. Is there any difference in the academic achievement of the girls learning by using ITS and boys learning by using ITS.
3. Is there any difference in the academic achievement of the General category students learning by using ITS and Other Backward Class students learning by using ITS.

Hypothesis

Null Hypothesis

1. There is no significant difference in the mean post-test score of the experimental group using ITS and the control group not using ITS for learning.
2. There is no significant difference in the mean post-test score of the girls and boys using ITS for learning.
3. There is no significant difference in the mean post-test score of the general and other backward class students using ITS for learning.

Research Hypothesis

1. There is significant difference in the mean post-test score of the experimental group using ITS than the control group not using ITS for learning.
2. There is significant difference in the mean post-test score of the girls and boys using ITS for learning.
3. There is significant difference in the mean post-test score of the general and other backward class students using ITS for learning.

Methodology Used

The pre-test post-test control group experimental method was used for the purpose of the study. Pre-test score was used as the reference to get an idea of the previous knowledge of the learner on the topic. Based on the pre-test score the learners were divided into two equivalent groups viz. the experimental group and the control group. The care was taken to assure that both the groups contain equivalized diverse population in terms of gender, cast and economic class.

Two sub topics 1) Surface Tension 2) Capillarity from 'Mechanical Properties of Fluids' was taught to both the groups in the class using traditional teaching method. Along with the teachers teaching, the Experimental group used ITS features of Khan Academy for learning the topic at their own space and time. Whereas, the control group was provided with the regular remedial teaching. The post test was conducted after completion of both the topics.

Sampling

The intact class of grade 11 consisting of 35 student from Govt. Higher Secondary School, Pernem Goa was selected as the population for the study. Out of which 30 students were randomly selected as the sample for the study. The students were assigned to the experimental and control group by matching the pretest score. Care was also taken to make the group equivalent in terms of gender, cast and economic class.

The experimental and control group consists of 15 students (9 girls and 6 boys) each. Both the groups had 7 general, 7 OBC and 1 SC student. The group equivalency was tested using Mann-Whitney test for pre-test score.

Statistical Tools and Methods of Data Analysis

Tools for data collection

- The achievement test designed by the researcher was used as the tool to collect the data in pre-test and post-test form.
- Learners were interviewed in groups to obtain the feedback.

Tools for data analysis

- The Mann-Whitney test was used on pre-test to test the equivalence of two groups since the groups were small in size.
- The data collected through the achievement tests was analyzed using t-test.

Scope Limitations and Delimitations

Scope

The present study is applicable to the students of grade 11 of Govt. Higher Secondary School Pernem Goa who have opted for physics. This study focuses only on the sub-topics 'Surface Tension and capillarity' from the main topic 'Mechanical Properties of fluids' from volume 2 from the Physics textbook prescribed by 'Goa Board of Secondary and Higher Secondary Education'.

Limitations

1. The previous knowledge of the learner, age, attitude, interest and aptitude are not taken into consideration for the purpose of the study.
2. t-test could not be administered to the student belonging to the Scheduled Cast category as there was only one student belonging to Scheduled Caste category in each group.

Delimitations

1. The study is delimited to the students of grade 11 from Govt. Higher Secondary School located at Pernem Taluka in the North Goa district in the state of Goa.

2. The study is delimited to only two sub topics 1) Surface Tension and 2) Capillarity from the chapter 'Mechanical Properties of Fluids' from grade 11 Physics.
3. The study is delimited to the use of free Intelligent Tutoring System offered by Khan Academy.

Results and Discussions

The post test score of the students was analyzed statistically using t-test at 95% confidence level as follows

Post test score of Experimental and Control Group

Expmtl	19	18	19	19	15	17	18	16	13	15	15	19	12	13	14
Gender	F	F	F	F	F	F	F	M	M	F	M	M	F	M	M
Caste	OBC	OBC	GEN	OBC	SC	OBC	GEN	GEN	GEN	OBC	GEN	GEN	OBC	GEN	OBC
Control	9	13	7	11	12	13	10	12	10	10	13	9	10	8	14
Gender	F	F	F	M	F	F	M	F	F	M	F	M	F	M	M
Caste	GEN	GEN	GEN	OBC	OBC	GEN	GEN	SC	OBC	GEN	OBC	OBC	OBC	OBC	GEN

Sr. No	Groups analyzed/ Values Obtained	Experimental Group using ITS and Control Group not using ITS	Girls using ITS and Boys using ITS	Students with General Class and OBC using
1	Df	28	13	12
2	Difference in the means of the two groups	5.40	1.89	0.14
3	Standard error of the difference	0.830	1.248	1.417
4	Calculated t-value	6.5061	1.5136	0.1008
5	Critical t-value	2.048	2.160	2.179
6	Comparison of t-values	Calculated t > Critical t	Critical t > Calculated t	Critical t > Calculated t
7	P value	<0.00001 Result is significant at $p<0.05$	= 0.77033 Result is not significant at $p<0.05$	= 0.46067 Result is not significant at $p<0.05$
8	Acceptance/Rejection of Null Hypothesis	Reject Null Hypothesis	Accept Null Hypothesis	Accept Null Hypothesis
9	Result	There is significant improvement in the mean post test score of the learners using ITS.	There is no significant difference in the mean post test score of the girls and boys using ITS.	There is no significant difference in the mean post test score of the General Category and OBC category learners
10	Conclusion	ITS used in addition to traditional teaching effectively improves the academic achievement of the learner	ITS used in addition to traditional teaching effectively improves the academic achievement of the learner irrespective of the gender differences.	ITS used in addition to traditional teaching effectively improves the academic achievement of the learner irrespective of the cast differences.

The analysis of post test data on the t-test scale and the p-value shows that the use of Intelligent Tutoring System can be effectively used to enhance the academic achievement of the learners irrespective of the gender and cast of the learners. This clearly indicates the supportive potential of AI – Intelligent Tutoring System in making the education inclusive.

Conclusion

The experimental study provides strong proof for integrating ITS in complement with the traditional teaching for improved academic achievement of the learners. The study also highlighted that adaptive potentials of ITS such as 24x7 availability, personalized adaptation, individualized instructions and feedback enhances the learning by motivating the learners. Therefore, use of ITS proves to be effective irrespective of the learner

differences such as gender and cast. The insights will definitely help the stakeholders to plan, design and implement the curriculum to effectively integrate ITS in education to obtain the maximum learning outcomes.

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South Asian Journal of
Participative Development

Vol.25, No.2 (Spl.), July - Dec. 2025
ISSN No: 0976-2701

Ethics and Needonomics in AI Era: R&D for Needo-Governance towards Viksit Bharat

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Abstract

This paper is an attempt to explore Ethics and Needonomics in AI Era: R&D for Needo-Governance towards Viksit Bharat. It has been argued that Needo-Governance: Street SMART Governance Model for the AI Age. The Key Features of Needo-Governance in the AI Era and Integrating Research, Ethics, and Governance for Viksit Bharat are detailed. In this spirit, Needonomics-inspired Needo-Governance can guide our research, innovation, and governance towards a just, sustainable, and enlightened Viksit Bharat.

Keywords: Ethics, Needonomics, AI Era, Needo Governance, Viksit Bharat.

Introduction

The world today is driven by artificial intelligence (AI) — an epochal force reshaping every sphere of human activity. AI promises to revolutionize education, governance, business, and daily life by amplifying productivity and efficiency. Yet, this transformation demands not only technological readiness but also *ethical preparedness*. India, marching toward the vision of Viksit Bharat 2047, must integrate innovation with values, efficiency with empathy, and advancement with accountability.This balance can be realized through the Needonomics Framework, a human-centric philosophy emphasizing the economics of *need* over *greed*. When applied to the sphere of Research and Development (R&D) in the AI era, Needonomics offers a compass that directs innovation towards social welfare, sustainable growth, and moral governance — the foundation of what we may call Needo-Governance.

R&D in AI Era: Opportunities and Responsibilities

AI-driven R&D is no longer confined to laboratories. It is reshaping policy, commerce, communication, and even consciousness. From healthcare diagnostics powered by machine learning to precision agriculture guided by predictive algorithms, AI-led research opens new frontiers of human potential.

However, this rapid progress brings challenges: ethical dilemmas, data privacy concerns, inequality in access to technology, and the risk of human displacement. The purpose of R&D must therefore evolve — not merely creating machines that think, but ensuring that

humans *think ethically* while creating machines. Here, the **Needonomics School of Thought (NST)** calls for reorienting research priorities — away from blind pursuit of profit toward purposeful innovation aligned with the genuine needs of society.

Needonomics Framework: A Value-Based Model for AI Development

The **Needonomics Framework**, inspired by the Bhagavad Gita and rooted in ethical economics, emphasizes moderation, balance, and responsibility. It advocates meeting *needs* rather than fueling *greed*. Applied to R&D in the AI era, it creates a moral ecosystem where innovation serves humanity rather than exploiting it.

The framework can be understood through three pillars:

- **Needo-awareness (Right Understanding):** Recognizing that technology must address the essential human needs — education, health, livelihood, and dignity — not the artificial desires created by market greed.
- **Needo-ethics (Right Conduct):** Embedding ethical reflection in research processes, ensuring that AI development respects human values, privacy, and fairness.
- **Needo-action (Right Implementation):** Translating research outcomes into equitable and sustainable solutions accessible to all, especially the marginalized and rural populations of Bharat. When these principles guide R&D, innovation becomes a moral enterprise — a service to *Lok Kalyan* (public welfare) rather than a pursuit of private gain.

Needo-Governance: Street SMART Governance Model for the AI Age

Needo-Governance is governance inspired by the philosophy of Needonomics—a human-centric approach that harmonizes efficiency, empathy, and ethics in public administration. It redefines the idea of governance by going beyond the conventional notion of "good governance" to higher standard — Street SMART governance, which stands for Simple, Moral, Action-oriented, Responsive, and Transparent governance.

In this model, simplicity ensures accessibility for all citizens; morality anchors every decision in ethical integrity; action-orientation ensures timely implementation; responsiveness builds trust through listening and adapting; and transparency guarantees accountability.

In the AI age, Needo-Governance means using technology to empower, not to exploit; to simplify human life, not to control it. Artificial intelligence, when aligned with Needonomics, becomes a tool for inclusive development and ethical innovation. It fosters decision-making that serves real human needs rather than algorithmic efficiency alone. The ultimate goal of Needo-Governance is to create a governance ecosystem that is both digitally smart and morally sound, ensuring that technology serves humanity—not the other way around.

Key Features of Needo-Governance in the AI Era:

Transparent Decision-Making:

AI-based tools must be transparent and accountable, ensuring that algorithmic decisions in public policy are explainable and bias-free.

Data Ethics and Privacy Protection:
Governance frameworks must safeguard citizens' data, treating information as a public trust, not a commodity.

Inclusive Innovation:
R&D initiatives should bridge the urban-rural divide by promoting digital literacy, affordable AI tools, and localized solutions in regional languages.

Sustainability and Simplicity:
Needo-Governance aligns with sustainable development goals — reducing wastage, energy misuse, and technological redundancy by promoting need-based applications.

Human Oversight in AI Systems:
AI must augment human judgment, not replace it. Ethical oversight and human accountability are essential for responsible governance. By adopting these principles, India can lead a new paradigm of governance — where digital power is balanced by moral responsibility.

Integrating Research, Ethics, and Governance for Viksit Bharat
For **Viksit Bharat 2047**, India must foster a research ecosystem that is innovative, inclusive, and rooted in indigenous values. The fusion of **AI research** with **Needonomics ethics** can form the cornerstone of a *value-based innovation model*.

R&D as a Public Good:
Research should not be confined to elite institutions or corporate labs but should serve as a public good. Government, academia, and industry partnerships must focus on areas that meet societal needs — from clean energy to health technologies and rural development.

AI for Bharat, Not Just for Business:
AI applications must be localized to serve *Bharat* — the villages, the small enterprises, and the unorganized sectors. This means using AI for crop monitoring, disaster management, affordable healthcare, and education delivery.

Ethical R&D Ecosystem:
Policies should mandate ethical review boards for AI research, ensuring that algorithms respect human dignity, avoid biases, and promote equality.

Education and Capacity Building:
Universities and research centers should integrate Needonomics-based ethics into STEM curricula. The youth must be trained not only to *create* intelligent systems but also to *govern* them wisely.

Collaboration and Global Leadership:
India can become a moral leader in AI governance by promoting a "Needo-Tech Diplomacy" — advocating ethical AI standards globally inspired by its civilizational wisdom of *Vasudhaiva Kutumbakam* (the world is one family).

Needonomics as the Moral Compass for Innovation

Innovation without direction can lead to destruction. The AI race, if unchecked by moral considerations, could create a future of inequality, surveillance, and moral decay. Needonomics acts as the *moral compass* — ensuring that progress remains humane. It reminds us that:

- We need not everything we can make.
- We must make only what we truly need.
- We should use technology to uplift, not to exploit.

AI should be seen not as artificial *intelligence* but as *Augmented Integrity* — a force multiplied by ethical intention.

The Needonomics approach transforms the pursuit of R&D from a competitive race into a cooperative mission for the greater good — aligning science with spirituality, technology with truth, and economics with ethics.

Towards Viksit Bharat: The Path Ahead

As Bharat aspires to become a *developed nation* by 2047, technological advancement alone will not suffice. The development must be holistic — blending digital excellence with moral consciousness.

To achieve this, India must:

- Encourage Needo-driven R&D that addresses the needs of people rather than market-driven greed.
  Institutionalize Needo-governance as a guiding principle for digital policies, ensuring transparency, fairness, and inclusivity.
- Build ethical AI systems that reflect the nation's civilizational wisdom and democratic spirit.
  Cultivate youth leadership rooted in values, preparing a generation that uses AI responsibly for social transformation.
- This journey from technological advancement to value-based development marks the true path toward Viksit Bharat — a Bharat that is not only advanced but awakened, not only digital but dignified.

Conclusion

The fusion of R&D, AI, and Needonomics represents the next evolution in India's development journey. Needonomics provides the philosophical depth, R&D provides the innovative engine, and Needo-Governance provides the ethical framework. Together, they ensure that progress serves humanity, not the other way around.As we step into an AI-powered future, Bharat must embrace the wisdom of *"Yogah Karmasu Kaushalam"* — excellence in action with purpose and balance. In this spirit, Needonomics-inspired Needo-Governance can guide our research, innovation, and governance towards a just, sustainable, and enlightened *Viksit Bharat*.

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South Asian Journal of
Participative Development

Vol.25, No.2 (Spl.), July - Dec. 2025
ISSN No: 0976-2701

Research and Development in the Era of Artificial Intelligence: Strengthening Research for Viksit Bharat @ 2047

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Abstract

The first six months of 2020, have had strong effects on the routine life of every individual. The life of individuals and the global economy was hugely impacted due to continuous lockdown and protective methods and at the same time minimized access to healthcare facilities. Protective measures are very much needed to reduce the spread of the COVID-19, these situations negatively impact the psycho-social and physical health of people. To normalize the daily life of individuals the technology equipment has been adopted widely to reduce these effects and to maintain overall health including spiritual wellness. These digital platforms are becoming alternatives to fulfill our day-to-day activities. On the other hand, the older population was most horribly affected due to the COVID-19, the lockdown and protective measures. And older adults are the least beneficiaries of any digital alternatives. There is always inequality in the usage of new technology based on age. During the COVID-19 pandemic, a large section of the population suffered from the virus, and digital measures are the least helpful especially for older adults.

Keywords: Older Adults, Spiritual wellness, Digitalization, Covid-19, Pandemic.

Introduction

The dawn of the 21st century has ushered in an era marked by rapid technological advancement and profound changes in how societies organise knowledge, work, and innovation. Among these advancements, Artificial Intelligence (AI) has emerged as a transformational force, driven by leaps in data availability, computing power and algorithmic sophistication. As defined by the NITI Aayog (2018), AI refers to systems that "think, perceive, learn, problem-solve and decide" in ways traditionally associated with human cognition (p. 5). In this context, AI is not merely another tool—it has the potential to reshape the very methods of research and development (R&D), alter innovation ecosystems, and accelerate knowledge creation and diffusion.

For India, the imperative to harness AI is particularly acute. As one of the world's fastest-growing major economies, and with a large population and demographic dividend, India faces multiple pressing challenges—including in health, agriculture, education,

infrastructure and environment. At the same time, the country has articulated the ambitious vision of becoming a "Viksit Bharat" (Developed India) by 2047, marking the centenary of its independence. Achieving this vision demands more than incremental progress; it requires a transformation of India's R&D ecosystem—enhancing capacity, fostering innovation, expanding inclusion, and generating resilient socio-economic outcomes.

The role of research and development in nation-building has been well documented. R&D investments drive technological change, raise productivity, create new industries and enhance living standards (Fieldhouse & Mertens, 2024; Wu, 2015). Specifically, government-funded R&D has been shown to yield sustained productivity gains over long periods. For example, in the United States, increases in non-defence government R&D appropriations were associated with higher output and labour productivity with a lag of several years (Fieldhouse & Mertens, 2024). In the Indian context, the link between R&D, innovation and economic growth has also been established: studies note that despite lower levels of R&D intensity compared to advanced economies, increased R&D spending and patenting correlate with improved growth prospects. Moreover, R&D contributes to social welfare through improved public goods, job creation and enhanced global competitiveness (We Forum, 2023).

Yet the challenge is not just volume, but orientation. It is not sufficient for R&D to be an isolated scientific endeavour; it must integrate with societal goals, inclusive growth strategies and local-relevance frameworks. The fusion of AI into R&D offers a distinct advantage: AI can accelerate the pace of research, open new frontiers of interdisciplinary enquiry, enable predictive modelling and simulation, automate routine work and enhance decision-making (NITI Aayog, 2018). For a nation like India with vast data sets, diverse contexts, underserved regions and an urgent need for scalable solutions - AI-enabled R&D could serve as a multiplier.

However, this opportunity is accompanied by multiple complexities. India's R&D intensity remains modest; the coordination among institutions, data ecosystems, regulatory frameworks, talent pipelines and ethical governance is still evolving. The inclusive dimension ensuring that no region or community is left behind adds further layers. Therefore, aligning AI-driven R&D with the vision of a Viksit Bharat in 2047 requires more than enthusiasm it requires strategic planning, resource mobilisation, capacity building and institutional alignment.

In light of these considerations, this paper centres around the following research - question: How can India strengthen its R&D ecosystem in the era of AI to realise the vision of Viksit Bharat by 2047? To answer this question, the paper proceeds through four major parts: (a) mapping the current Indian AI-R&D landscape, (b) analysing the transformative potential and opportunities of AI for R&D, (c) identifying key challenges and bottlenecks, and (d) proposing a strategic framework and roadmap to strengthen and scale AI-enabled R&D for inclusive and sustainable development by 2047.

By doing so, the paper argues that achieving a developed India is not primarily about high-tech exports or narrow growth metrics but about building a knowledge-driven,

innovation-led and inclusive R&D ecosystem where AI is a facilitator of human potential, ethical innovation and social impact. The vision is of a nation where R&D is not only for innovation, but for inclusion; not only for growth, but for people.

Methodology

Research Design

This study adopts a qualitative research design based on a systematic literature review and policy document analysis. The aim is to explore how Artificial Intelligence (AI) is transforming research and development (R&D) in India and to identify strategies to strengthen R&D in alignment with the national vision of *Viksit Bharat @ 2047*.

A literature-based qualitative approach is appropriate because the topic involves rapidly evolving technologies, multi-sectoral policies, and conceptual linkages that are best examined through interpretive synthesis rather than quantitative measurement. The systematic review method was chosen to ensure a transparent, replicable and comprehensive process of identifying, evaluating and synthesising relevant studies and documents. This was complemented with policy analysis, as government strategies, white papers, and mission documents form the backbone of India's AI-R&D ecosystem.

Research Question

The central research question guiding this study is: How can India strengthen its research and development ecosystem in the era of Artificial Intelligence to realise the vision of Viksit Bharat @ 2047?

Data Sources

Two primary data sources were used: Academic Literature – Peer-reviewed journal articles, conference proceedings, and working papers published between 2015 and 2025 were searched using databases such as Google Scholar, SSRN, Scopus, and ResearchGate. These sources provided insights into global and Indian perspectives on AI, R&D, innovation policy, and national development strategies. Policy Documents and Institutional Reports – Official government reports and mission documents were reviewed, including: *National Strategy for Artificial Intelligence* (NITI Aayog, 2018) *IndiaAI Mission* (Press Information Bureau [PIB], 2024; 2025) *AI Governance Guidelines* (MeitY, 2023) *Science, Technology, and Innovation Policy 2020 (Draft)* (DST, 2020) *UNESCO Science Report: The Race Against Time for Smarter Development* (UNESCO, 2021). These materials provided authoritative information on policy directions, institutional frameworks, and emerging initiatives within India's R&D ecosystem.

Search Strategy

A structured search strategy was implemented to identify relevant literature. Keywords and Boolean operators were used to combine key concepts related to *Artificial Intelligence*, *Research and Development*, *Innovation Policy*, *India*, and *Viksit Bharat 2047*.

Example search strings included: "Artificial Intelligence" AND "Research and Development" AND "India", "AI policy India" OR "National Strategy for Artificial Intelligence", "R&D investment" AND "innovation ecosystem" AND "India", "AI for

inclusive growth" AND "Viksit Bharat 2047". All searches were limited to English-language publications. The initial database search yielded 186 records, which were screened through the inclusion and exclusion criteria outlined below.

Inclusion and Exclusion Criteria

To maintain quality and relevance, the following inclusion and exclusion criteria were applied.

Inclusion Criteria

- Studies, reports, or policy documents published between 2015 and 2025.
- Publications focusing on India's AI, innovation, science or R&D ecosystems, or containing comparative analysis relevant to India.
- Peer-reviewed journal articles, books, or authoritative reports from recognised organisations (e.g., NITI Aayog, UNESCO, OECD, World Bank, IMF).
- Studies providing empirical, conceptual, or policy insights into AI-driven R&D, innovation management, or national development strategies.
- Open-access or publicly available sources with transparent authorship.

Exclusion Criteria

- Publications predating 2015, unless historically significant (e.g., early conceptual models of R&D and growth).
- Non-academic or unverified sources such as blogs, social-media posts, or non-governmental opinion pieces.

Data Extraction and Thematic Analysis

Relevant data were extracted under the following categories:

- Author(s), year, and publication type
- Geographic scope (India, global, comparative)
- Key themes: AI applications, policy frameworks, R&D investment, institutional structures, challenges, and recommendations
- Identified outcomes and implications for Viksit Bharat 2047

Findings

AI in Transforming Research and Development Practices

The integration of Artificial Intelligence (AI) into research and development (R&D) processes has significantly altered the ways in which knowledge is generated, managed, and applied. Studies indicate that AI's analytical capacity, automation potential, and predictive modelling abilities have accelerated innovation cycles and reduced R&D costs globally (Mariani, 2023; McKinsey & Company, 2025). Mariani (2023) conducted a systematic review of AI in innovation research and found that AI is shifting from being a support tool to becoming a central enabler of scientific discovery and creative ideation.

Similarly, Madanchian (2024) highlighted that AI technologies enhance high-tech R&D efficiency through automation, advanced simulation, and real-time optimisation in industrial contexts such as aerospace and biotechnology. According to McKinsey & Company (2025), AI can potentially "double the pace of R&D" by shortening discovery timelines and improving experimentation efficiency.

However, the literature also cautions that while AI accelerates R&D processes, human oversight, domain expertise, and interpretive reasoning remain indispensable (TechScience, 2024). Thus, rather than replacing traditional research methods, AI complements and enhances them — redefining epistemic boundaries between human cognition and machine-assisted reasoning.

Innovation Ecosystems and AI-Enabled R&D

A growing body of work focuses on the AI-enabled innovation ecosystem, which encompasses interconnected institutions like universities, industries, start-ups, and government agencies supported by data, talent, and digital infrastructure. In Asia, Lee (2023) underscores that regional collaboration and policy coherence are essential for building sustainable AI innovation ecosystems, noting that Asia-Pacific economies must combine "technological readiness with institutional agility." In the Indian context, Suri (2025) identifies three critical deficits — talent, data, and R&D investment — which together limit India's ability to compete globally in AI innovation. He argues that without addressing these gaps, India's AI initiatives will remain fragmented and hardware-centric. This ecosystem approach suggests that AI-driven R&D success depends not only on algorithms and computing power but also on the institutional connectivity and policy coherence enabling multi-sector collaboration (Suri, 2025).

Sectoral Applications of AI in R&D

Healthcare and Pharmaceuticals

AI's impact on healthcare and pharmaceutical R&D is particularly transformative. Paul et al. (2020) outline how AI algorithms facilitate drug discovery, molecular simulation, and precision medicine. AI's ability to identify potential drug targets, repurpose existing compounds, and optimise clinical trial designs dramatically shortens the drug development lifecycle (Paul et al., 2020).

Saini et al. (2025) extend this discussion by examining AI-driven innovations in the pharmaceutical industry, finding that AI supports every stage of drug development — from design to post-marketing surveillance. Their study concludes that AI-enabled predictive analytics can reduce development costs and improve patient outcomes through personalised medicine.

These findings have direct implications for India, where the pharmaceutical sector is a cornerstone of economic growth. Integrating AI into biomedical R&D aligns with India's goals under the *National Health Mission* and the *Digital Health Mission* (NITI Aayog, 2018).

Agriculture and Environmental Sustainability

AI is increasingly being used to address environmental sustainability and agricultural productivity. Ning et al. (2025) demonstrate how AI reshapes global green value chains (GGVCs) through innovations in material science, energy optimisation, and recycling. These applications advance sustainability by reducing resource wastage and promoting circular economy principles. For India, where agriculture employs nearly half the workforce, AI-driven predictive models and precision farming techniques can optimise

irrigation, improve crop yields, and enhance resilience to climate change (UNESCO, 2021). Thus, AI-R&D integration serves as both a technological and developmental imperative.

Manufacturing and Industry 4.0

AI's role in industrial R&D is equally critical. Madanchian (2024) notes that high-tech manufacturing sectors including automotive and electronics increasingly use AI to design, test, and optimise new products. This trend exemplifies the transition toward Industry 4.0, characterised by cyber-physical systems, automation, and intelligent analytics. For India's *Make in India* initiative, this integration of AI into R&D can strengthen global competitiveness and promote technological self-reliance.

Governance, Ethics, & Data Infrastructure in AI-Driven R&D

The literature increasingly stresses the need for responsible AI governance to ensure transparency, accountability, and fairness in AI-driven R&D. Batool, Zowghi, and Bano (2023) conducted a systematic review identifying key governance gaps such as lack of explainability, bias mitigation, and ethical oversight. They argue that without robust governance mechanisms, AI may reproduce or amplify existing inequalities within research systems.

Furthermore, data infrastructure remains a foundational challenge. Qu et al. (2025) emphasise that data accessibility, interoperability, and quality are essential for effective AI-enabled innovation. For developing nations like India, investment in Digital Public Infrastructure (DPI) — such as open datasets and computing resources — is critical to democratise research and innovation.

Inclusivity is another important concern. Chakravorti et al. (2023) argue that AI-based research tools should complement rather than replace human research assessment, particularly in contexts like India where research evaluation is socially embedded. Their study highlights the importance of context-sensitive AI applications that respect epistemic diversity and local research cultures.

India-Specific Perspectives: Challenges & Strategic Directions

India's AI and R&D ecosystem have received increasing scholarly and policy attention. The *National Strategy for Artificial Intelligence* (NITI Aayog, 2018) outlined five key sectors - healthcare, agriculture, education, smart cities, and smart mobility - as focal points for AI adoption. The strategy emphasised an inclusive approach under the motto "AI for All," aligning AI applications with the Sustainable Development Goals (SDGs).

Despite these initiatives, scholars highlight persistent challenges. Suri (2025) underscores that India's R&D expenditure remains below 1% of GDP, compared to 2–4% in leading economies. Pradhan (2021) points out that AI adoption in Indian healthcare research is limited by infrastructural deficits, lack of skilled manpower, and ethical concerns around data privacy. Similarly, NITI Aayog's (2025) report *AI for Viksit Bharat: The Opportunity for Accelerated Economic Growth* identifies uneven regional access to AI infrastructure as a major constraint on equitable innovation.

UNESCO's (2021) *Science Report* situates India's AI ambitions within a broader global context, urging investment in human capital and research capacity to harness AI for sustainable development. Collectively, these sources suggest that while India's AI policy landscape is strong, effective implementation requires multi-stakeholder collaboration, ethical governance, and inclusive innovation practices.

Emerging Themes in AI-R&D Literature

Three cross-cutting themes emerge from this body of literature:

- *Human-AI Collaboration:* Future R&D will increasingly involve hybrid intelligence systems where human creativity complements machine learning (Mariani, 2023; Chakravorti et al., 2023).
- *Sustainability and Social Impact:* AI-R&D must contribute to environmental sustainability and social welfare, not merely economic growth (Ning et al., 2025; UNESCO, 2021).
- *Strategic Autonomy and Global Competitiveness:* For India, AI-driven R&D is also a question of technological sovereignty — ensuring self-reliance in strategic sectors (Suri, 2025; NITI Aayog, 2018).

Together, these insights highlight that AI's role in R&D is transformative but must be ethically governed, inclusively designed, and strategically aligned with national development goals.

Policy Framework for Strengthening R&D for Viksit Bharat

Achieving the vision of a developed India by 2047 demands more than aspiration—it requires a comprehensive, systemic policy framework for research and development (R&D) that is deeply integrated with artificial intelligence (AI) capabilities. The following strategic pillars outline how India can accelerate this transformation in a coherent, inclusive and future-ready way.

(a) Enhancing R&D Investment

Rationale & Current Situation: Investment in R&D is a foundational lever. Without adequate funding, advanced research—including AI-driven innovation—cannot scale. India's gross expenditure on R&D (GERD) has shown growth: for example, one government statement notes that expenditure rose from approx. ₹60,196 crore in 2010-11 to ₹1,27,380.96 crore in 2020-21. Yet even this appears modest compared to leading countries, and private sector participation remains relatively low.

Strategies:

- Increase public expenditure on R&D to at least 2% of GDP. This target aligns more closely with global innovation-leaders and would signal a serious national commitment.
- Encourage private sector R&D by offering tax incentives, innovation grants, matching funds or co-funding schemes. The recently launched Research, Development and Innovation (RDI) Scheme with an outlay of ₹1 lakh crore illustrates such a push to stimulate private-led innovation. Press Information Bureau+1
- Promote the venture capital/start-up ecosystem in AI research by developing deep-tech funds, incubators, and support platforms specifically oriented to

AI/ML, large-scale compute, data analytics, and translation of research to industry. Deep-tech investment is increasingly recognised as key to turning innovation into commercial and social impact.

Implementation Considerations:

- Set transparent funding priorities aligned with strategic national missions (AI, quantum, semiconductors, etc.).
- Build mechanisms for public-private partnerships (PPP) in R&D infrastructure and programmes.
- Craft performance metrics and accountability systems to ensure effective use of funds (e.g., large-scale translational research, patent output, start-ups created, real-world adoption).

(b) Building Human Capital

Rationale & Current Situation: AI-enabled R&D will only succeed if India develops a robust human capital base—researchers, data scientists, ethical AI specialists, domain-experts in agriculture, health, environment, social sciences. While India has a large STEM cohort, there are concerns about the depth of high-end AI research skills, interdisciplinary capabilities, and representation of women/marginalised groups.

Strategies:

- Integrate AI, data science, and research ethics into higher education curricula across disciplines (engineering, science, humanities, social sciences), ensuring that next-generation researchers understand both technical and societal implications.
- Strengthen academia–industry–government collaboration: joint research chairs, industry-funded projects in universities, researcher mobility between sectors, internships in AI research labs, and collaborative labs.
- Support women and marginalised groups in science and technology careers through scholarships, mentorship programmes, targeted outreach, and institutional reforms to reduce barriers (gender, region, socio-economic status).

Implementation Considerations:

- Develop national fellowships and chairs in AI-R&D for early-career researchers and women/marginalised candidates.
- Incentivise universities to create interdisciplinary programmes combining AI with domain-areas (e.g., AI + agriculture, AI + climate science, AI + social work).
- Monitor metrics such as diversity in research programmes, number of female PhD scholars in AI, geographic spread of talents from tier-2/tier-3 cities.

(c) Establishing AI Research Hubs

Rationale & Current Situation: Research hubs act as dense ecosystems where knowledge, talent, data, compute infrastructure, industry collaboration and innovation converge. For AI-driven R&D to scale, creation of such hubs is essential—especially outside the major metropolitan centres—to ensure distributed capacity and national reach.

Strategies:

- Create AI Centres of Excellence (CoEs) in major universities and regional institutes, equipped with high-performance computing, specialised labs, access to large datasets, and cross-disciplinary teams (data scientists, domain researchers, ethicists).
- Promote interdisciplinary research linking STEM, humanities, social sciences, policy and ethics to ensure AI research is socially relevant, ethically robust and inclusive.
- Foster global collaborations: partnerships with international universities, research labs, industry R&D centres, joint labs, researcher exchanges, data sharing (with appropriate safeguards), and global standard-setting involvement.

Implementation Considerations:

- Identify high-potential regions for hub establishment to ensure geographical inclusivity.
- Allocate seed funding and incentives for universities/institutes to apply for CoE status, with clear criteria (research output, industry linkages, collaborations, data infrastructure).
- Facilitate cluster-thinking: encourage nearby industries, start-ups, research labs, accelerators around the CoE to create innovation ecosystems.

(d) Data and Ethics Framework

Rationale & Current Situation: AI-enabled R&D depends heavily on data—large-scale, high-quality, accessible, interoperable—and ethical frameworks that ensure trust, fairness, privacy and accountability. India's recent policy literature emphasises these aspects: for example, the India AI Governance Guidelines establish principles such as trust, inclusive development, and balanced innovation.

Strategies:

- Develop a National Data Governance Policy: define standards for data collection, sharing, interoperability, anonymisation, open-data platforms, public-private data partnerships, with protections for privacy, consent and equity.
- Institutionalise ethical AI guidelines aligned with human rights, social equity, and inclusive development: mandated review boards for research, ethics clearance for AI-R&D, fairness audits, transparency in AI models, bias mitigation.
- Establish sandbox frameworks and regulatory sandboxes for AI research translation that enable experimentation with safeguards and responsible innovation.

Implementation Considerations:

- Set up a national-level data-governance authority or empower an existing body with clear mandate and resources to oversee policy implementation.
- Encourage open-data platforms and data sharing portals for research institutions, industry and academia under common standards.
- Integrate ethics training into AI-R&D curricula, requiring all researchers to undertake modules on responsible AI and data governance.

(e) Inclusive Innovation

Rationale & Current Situation: A vision of Viksit Bharat must ensure innovation delivers inclusive development—not just high-end technologies for urban areas but solutions for rural livelihoods, marginalised communities, education, health and sustainable agriculture. AI-enabled R&D holds potential for "AI-for-social-good" but only if directed intentionally.

Strategies:

- Promote AI for Social Good: invest in research and innovation targeting rural livelihoods, healthcare access, education equity, sustainable agriculture, environment/climate resilience. AI-R&D funding calls should include explicit 'social-impact' streams.
- Empower start-ups and MSMEs to integrate AI into local problem-solving: micro-grants, localisation of AI tools for vernacular languages, regional data sets, low-cost AI solutions for small enterprises.
- Encourage regional innovation ecosystems: support labs, innovation cells, incubators in tier-2/tier-3 towns, rural universities, tribal regions—ensuring that research and innovation capacity is not concentrated only in major metros.

Implementation Considerations:

- Use challenge-based funding models: e.g., competitions for AI solutions addressing child-health, maternal-health, smallholder agriculture, water-management, climate adaptation.
- Provide procurement support and pilot-deployment of AI innovations in government programmes (e.g., digital health, smart agriculture) to validate and scale solutions.
- Collect metrics on equitable benefit distribution (geographic, gender, socio-economic) from funded innovation programmes.

(f) Monitoring and Evaluation

Rationale & Current Situation: Without robust monitoring and evaluation (M&E), strategic policy frameworks lack accountability, and progress may falter. For an AI-enabled R&D ecosystem to deliver by 2047, continuous tracking, feedback loops, data-driven decision-making and recalibration are essential.

Strategies:

- Establish an AI Innovation Index to track national progress in AI-enabled R&D: metrics could include R&D spend, number of AI-R&D projects, patents filed, start-ups created, diversity metrics, sectoral coverage, translation outcomes, regional spread.
- Use data-driven policy assessment tools: dashboards, periodic evaluations, benchmarking against global peers, institutional performance scorecards, real-time metrics for government and funding agencies.

- Institutionalise feedback loops: annual reviews of policy performance, stakeholder consultations (academia, industry, civil society), and mechanisms to adjust policies based on evidence and changing technology landscapes.

Implementation Considerations:

- Define baseline data, set realistic short-term, medium-term and long-term targets aligned with the 2047 vision.
- Ensure transparency and public reporting of the index and evaluation outcomes to build trust and drive continuous improvement.
- Allocate dedicated funding for evaluation, data-collection and research into policy outcomes.

Vision of Viksit Bharat @ 2047 Through AI-Driven Research

By 2047, India aspires to become a knowledge super-power—a nation where innovation is indigenous, inclusive and impactful. An AI-enabled R&D ecosystem will be instrumental in realising this vision through multiple dimensions:

Scientific Self-Reliance: By developing indigenous technologies, reducing dependence on imports in key sectors (semiconductors, AI chips, defence, pharmaceuticals) and building strong domestic research capabilities.

Inclusive Development: By ensuring that rural and under-privileged communities also benefit from innovation—through AI-driven solutions in agriculture, health, education, climate adaptation—rather than leaving them behind.

Sustainable Growth: By balancing economic advancement with environmental responsibility—deploying AI for efficient resource use, green value-chains, renewable energy optimisation, climate impact research.

Global Leadership: By becoming a hub for ethical and human-centric AI research, contributing to global standards, collaborating with international institutions, and exporting AI-enabled solutions customised for emerging markets.

The spirit of "Atmanirbhar Bharat" (self-reliant India) complements this goal; AI and R&D synergise to make India a contributor rather than a mere consumer in the global technology ecosystem.

Conclusion

This policy framework provides a roadmap—but the effectiveness will depend on implementation, institutional coordination, resource mobilisation, talent nurturing, and continuous evaluation. For a real transformation by 2047, India must move from incremental reforms to systemic change, where AI-enabled R&D becomes mainstream, inclusive and nationally distributed. The synergy of investment, talent, infrastructure, ethics, inclusion and monitoring will determine whether the vision of Viksit Bharat can be realised.

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South Asian Journal of
Participative Development

Vol.25, No.2 (Spl.), July - Dec. 2025
ISSN No: 0976-2701

Exploration of Cause Based AI Campaigns in Fostering Sustainable Purchase Intention Among Consumers

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Abstract

In the era of socially responsible consumers, AI-based purpose-driven brand campaigns play a significant role in fostering sustainable consumption. This study will evaluate the effectiveness of such campaigns by determining the level of consumer awareness and by investigating the perceived effectiveness of support, which is restricted to cash or product donations, based on brand-cause fit. A structured questionnaire will be administered to approximately 126 respondents using a convenience sampling method. The collected data will be examined and interpreted to identify meaningful information. Consumers will be less likely to perceive the brand as acting out of a profit motive when the cause fit is strong and more likely to perceive the company as sincerely dedicated to the cause. This paper will provide valuable insights for marketers seeking to develop authentic, engaging, and socially responsible AI-based brand campaigns that resonate with consumers and accurately reflect their core brand values.

Keywords: Purpose-driven brand, AI-based purpose-driven campaigns, eco responsibility, brand cause alignment, buying habits of consumer.

Introduction

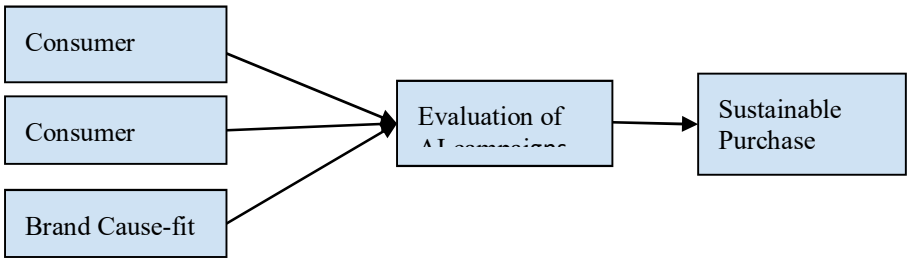
Nowadays, numerous brands not only want to sell something, but also to encourage activities that will benefit society and save the environment. This method is referred to as purpose-driven brand campaigns, which means that a brand associates its products with a significant social or environmental cause. Such campaigns are being financially assisted by AI-driven marketing tools, which are effective in enhancing the brand communication with the consumers. AI-based campaigns incorporate AI capabilities such as data mining, artificial intelligence and automation to learn the perception of consumers, anticipate their preference and deliver tailored messages. Those campaigns are not merely advertisements as they present a meaningful message to a wide audience, motivate positive changes, and demonstrate the true values of the brand. Such campaigns, when true and properly planned, can produce powerful emotional bonds and establish long-term trust among consumers.

Within recent years, the concept of sustainable consumption has come into the spotlight as citizens are advised to make a positive change towards environmental protection, as well as ensuring the well-being of communities. The campaigns that have a purpose are useful to promote this idea by demonstrating through targeted Advertising that it is also possible to purchase in order to make some contribution to a greater cause like environmental protection, women's empowerment, or community welfare. They not only have purchasing power, but they also can motivate people to lead more responsible lifestyles. Key determinants that are important to the success of such campaigns include consumer awareness, brand–cause fit, consumer attitude, and evaluation of AI campaigns. In case consumers are not informed about the campaigns or do not find the cause relevant to the brand, the effects will be minimal. Conversely, awareness and brand cause relationship can be high and render the campaign more valid and effective. Social responsibility and the integration of technology with the AI-based purpose-driven brand campaigns, therefore are achieved through AI, which motivates consumers to consider making thoughtful and sustainable purchasing choices. These kinds of campaigns might contribute to brands establishing more sustainable connections with consumers, advocating sustainable consumption, and doing good for society.

Study objectives

1. To identify the overall level of consumers responses towards the attributes of AI-based purpose driven brand campaigns.
2. To examine the relationship between AI-based purpose-driven campaign attributes and Sustainable Purchase Intention
3. To analyze the variations in consumers' perception across various common causes featured in brand campaigns.
4. To study the moderating effect between AI-based purpose-driven campaign attributes and Sustainable Purchase Intention

Conceptual Framework



Source: Tsai et.al. (2009) e Silva et.al. (2020)

Review of Literature

Jayasingh et al. (2025), examined the impact of AI-based marketing campaigns on consumer behavior, The study highlighted that credible and human-like AI influencers build trust and relatability among consumers. It also emphasized that consumer engagement mediates the link between campaign features and purchase intention. Overall, the authors concluded that trust, authenticity, and engaging content are key for successful

AI-driven marketing campaigns. Qiu et al. (2025), studied revealed that a cause-related marketing (CRM) advertisement was created using artificial intelligence (AI) affects consumers. The results showed that when people knew an ad was AI-generated, their purchase intention decreased compared to human-created ads, especially in social or charity-related (CRM) contexts. The study also found that people with high AI aversion reacted more negatively. Overall, the research suggested that while AI makes marketing more efficient, openly disclosing its use in CRM ads can reduce trust and effectiveness.

Guilherme Mamede Teles (2024) examined the impact of the persuasion knowledge about marketing strategies on how people react to advertisements related to Cause-Related Marketing. Online experiments revealed that, in conditions where the brand best fit the brand image, consumers who were informed acted more positively as compared to when it did not fit their image. The research indicates that the choice of causes that brands use in their campaigns should fit their identity to make it effective. Gayathri M (2020) constructed a Likert-based questionnaire that would be able to gauge the awareness level, perception, and behavioral intentions of respondents in the context of cause-related marketing. It was also set out to be used for the primary data gathering, and this was done using a 5-point agreement scale, which allowed statistical analysis to come up with some trends and information that would help it match the objective of the study.

Sreejesh et al. (2020) explored to focus attention on the effect of different cause-related marketing (CRM) campaigns on the purchase intention. The study conducted an experimental research design with survey data and provided support that a high degree of brand-cause fit and direct cause communication makes a major impact, increasing the expectations of consumer trust and buying choice. The outcomes underline the fact that the choice of a suitable cause and presentation of the latter is paramount in the successful CRM implementation. Molinillo, Mercad, and Mel (2020) achieved the same results using SEM and found that the fit enhances corporate credibility in terms of both functional and image fit. Conventional media is associated with functional fit, whereas social media is associated with image fit, highlighting the importance of communication channels being tailor-made.

Husnain et al. (2019) examined the impact of social media promotion on brand esteem, as well as purchase plans established that effective social media marketing creates a strong brand value and, as such, it motivates more people to purchase. The authors express the idea that social media should be actively used to reach customers and develop the brand. Chin Kok Foo & Rashad Yazdanifard (2019) described the following advantages, strategies, and problems of cause-related marketing based on the qualitative literature review and the case studies. They determined that corporate responsibility management strengthens the image of the company, increases customer attitudes, and reduces exploitation of causes. The scope of the study found that ethical and well-aligned CRM is capable of producing wins in both companies and communities.

Vander Lans et al. (2016) applied a subject experimental design and found that under the condition of a close fit between the product and the cause that the consumer supports, When the sine of the donation is bigger, they will show more positive attitudes and higher purchase intention. Ravichandran. D and Arul P (2016) reviewed the concept of cause-

related marketing and stated that it can help in enhancing the brand image and customer loyalty, leading to increased sales and having a positive impact on social issues. They observed that success is dictated by matching causes with brand values and the involvement of consumers, but there are challenges, such as skepticism.

Witek & Hall (2016) tested the applications of the presumption and crowdsourcing in the development of the cause-related Marketing campaigns. It was identified that engaging consumers in the generation of ideas could enhance the involvement; however, low trust and awareness tend to reduce participation, which brings the importance of creative as well as interactive digital campaigns. Lucke and Heinze (2015) revealed that the donation choice in cause-related marketing decreased the intent to purchase due to decreased interest in the cause and that of the product. The research indicates that providing choice restriction can result in maintaining a consumer focus on the campaigns and maximizing their efficiency.

Kim et al. (2014) In the current research, the extent of the effectiveness of a cause as relevant to the brand and campaign message was examined. Once such a fit is desirable, people will be more confident in the campaign and will be more willing to participate. According to the authors, brands ought to select the cause and messages that resonate with their image. Walter Wymer (2013) has discussed the impact of variables, including consumer awareness perception and attitude towards cause brand marketing campaigns. It has been highlighted in the study that the brand fits the demographic traits, as well as the scepticism of the consumers regarding the advertisement, may considerably influence the effectiveness of the cause-related marketing campaigns.

Mishra (2012) attempted to determine the effectiveness of cause-related marketing in influencing the purchase behavior of various consumers and influencing their perception of different brands. The article revealed that brand equity and the positive attitude of consumers can be affected by well-elaborated and communicated CRM campaigns. Myers and Forsy (2012) identify the positive role of high cause to brand fit in enhancing perceived altruistic motives and the attitudes toward campaigns, but the source of news did not cause much difference, noting that there is a necessity to have a high level of brand and message fit.
Wang and Yang (2010), when employing a questionnaire survey, found that cause brand fit enhances consumer trust, which positively influences purchase, and thus brand identity alignment, proportionate to the endorsed cause intention, should also be taken into consideration. Roy (2010) evaluated the reasons why individuals patronize cause-related marketing. It has been discovered that the customers are more likely to purchase the campaign and enjoy it when they are convinced that a firm cares about a cause for altruistic motives. The same is true where they believe that the organization's motive is solely for selfish gain. Tsai (2009), The study raises the issues of the factors that lead to the success of CRM. Conducting research based on structural equation modeling among 669 consumers, the research identified that prior brand experience influences positive motivational attribution, which in turn creates moral emotion, which enhances purchase intention directly.

Chang (2008) addressed the reaction of individuals to cause-related marketing when they believe that a firm is acting in a fake manner. It concluded that when individuals reduce the amount of dishonesty they can tolerate before signing off on trust, they take only a brief time to form a negative outlook of the brand and lose interest in purchasing. According to the author, the companies ought to tell themselves the truth about the campaigns. Gupta and Pirsch (2006) conducted a study that researched the effectiveness of cause-related marketing campaigns and concluded that success primarily depends on the perceived compatibility between the organization and the reason and the efficacy of the message of the campaign. They indicated that it was possible to generate a significant brand image and purchase intention in a scenario that the joint venture is considered a legitimate venture.

Varadarajan et al. (2005) defined cause-based marketing as a strategic relationship between corporate enterprises and nonprofits that increases sales and aids society in solving some social problems. They emphasized that the association between cause and brand credibility and consumer interaction is the key to the route to CRM success, and that a mismatch of transparency issues may result in consumer skepticism. Lafferty et al. (2004) has looked at the effect of cause brand alliances on consumer attitudes and purchase intention, establishing that consumers perceived a closure fit between the brand and the cause increases its credibility and effectiveness. This paper highlighted that consumer trust and perceived honesty are vital to the success of CRM and that, indeed, poor cause brand match may diminish the positive effect.

Research Methodology

This study explores the Role of AI-based Purpose-Driven Brand Campaigns in Promoting Sustainable Purchase Intention among Consumers. This methodology involves defining the research design, data collection methods, sampling techniques, and analytical tools to ensure the study's reliability and validity.

Research Design

Table 1: Research Design	
Data Collection	Primary and Secondary Sources
Target Population	General Consumers
Sample Technique	convenience Sampling
Sample Size	126
Statistical tools used	Weighted Mean, Correlation, One–Way ANOVA and SEM
Software used	MS-Excel, IBM SPSS Statistics 26 and IBM SPSS AMOS 21

Primary Data

In this study, a structured questionnaire-based survey via Google Forms was distributed to consumers who were exposed to purpose-driven brand campaigns to collect primary data. In the evaluation of the Questionnaire reliability, a statistical measure in the form Cronbach alpha was used. The findings demonstrate that all constructs achieved acceptable reliability levels. All constructs - Consumer Awareness (4 items, $\alpha = 0.743$), Consumer Attitude (4 items, $\alpha = 0.743$), Brand-cause fit (3 items, $\alpha = 0.701$), Evaluation

of campaign (3 items, α = 0.701), Moral Pleasure for participation (4 items, α = 0.783) and Sustainable Purchase Intention (3 items, α = 0.772.)

Table 2: Reliability Statistics		
Constructs	Reliability Score Alpha (α)	No. of Items
Consumer Awareness	0.743	4
Consumer Attitude	0.743	4
Brand-cause fit	0.691	3
Evaluation of AI campaigns	0.691	3
Sustainable Purchase Intention	0.772	3

Secondary Data

Secondary data was gathered from research articles and journals related to my title and reliable online sources to support my theoretical background.

Sampling technique

In this study, the convenience sampling was employed whereby the study participants were selected due to their accessibility and their eagerness to participate in the survey. This approach was chosen to gather the response of general consumers in quick and efficient manner.

Tools For Data Analysis

Weighted Mean

Weighted Mean is a form of average where the values in the data are multiplied by the given weight, based on the importance or frequency of that value, before computing the average. This tool was applied in the study to determine the levels of awareness of purpose-driven brand campaigns among consumers and to compare the awareness levels.

Correlation

Correlation is a statistical relationship defined as a measure to establish a correlation between two variables. In this instance, it has been used in the establishment of the relationship between Consumer Awareness and Sustainable Purchase Intention, to determine the relationship between the changes in one and the other.

One–Way ANOVA

One-Way ANOVA (Analysis of Variance) is used to ascertain the difference between the means of three or more independent groups statistically. This is used to analyze the variations in consumers' perception across various common causes featured in brand campaigns.

Structural Equation Model

Structural Equation Modelling (SEM) is a statistical method that is employed to analyse the relationship among two or more variation at a time in a complex way. It facilitates the determination of the direct and indirect effects as well as various aspects impact each other in a conceptual context. It was employed to examine the moderating effect between purpose driven campaign attributes and sustainable purchase intentions of consumers.

Software used
The study used MS Excel 2010, IBM SPSS Statistics 26 and IBM SPSS AMOS 21 for statistical analysis.

Data Analysis and Interpretation
This chapter focuses on data analysis, which is necessary for drawing conclusions and making interpretations. The survey was completed by 126 respondents. Tabulation and charts are used to present relevant statistical analysis and interpretation for a better understanding.

Demographic Profile-Percentage Analysis
The demographic profile of the respondents is derived from a sample of 126 individuals. The frequency distribution of these key demographics was examined, and the findings are summarized.

Table 3: Respondents' Demographic Profile

Description		Frequency (N=126)	Percent (%)
Age	Below 20 years	9	7.1
	21 -30 years	60	47.6
	31 – 40 years	40	31.7
	Above 40 years	17	13.5
Gender	Female	63	50.0
	Male	63	50.0
Education	Higher Secondary	27	21.4
	Under Graduate	42	33.3
	Post Graduate	41	32.5
	Professional	16	12.7
Occupation	Student	24	19.0
	Self employed	31	24.6
	Government employee	11	8.7
	Private sector employed	50	39.7
	Home maker	10	7.9
Family Monthly Income	Below Rs.30,000	73	57.9
	Rs.30,001-60,000	31	24.6
	Rs.60,001-90,000	12	9.5
	Above 90,000	10	7.9

Source: Primary Data & Computed through SPSS

Table 3 indicates that the demographic profile of the 126 respondents shows representation across different age groups, with 7.1% aged below 20 years, 47.6% between 21–30 years, 31.7% between 31–40 years, and 13.5% above 40 years. The sample includes males and females with equal ratio representing 50%. Educational qualifications vary, with 21.4% having completed higher secondary education, 33.3% as undergraduates, 32.5% as postgraduates, and 12.7% holding professional qualifications. In Occupation 19% are students, 24.6% are self-employed, 8.7 % of them work in government sectors,39.7% of them are employees in the private sector and 7.9% are home staying. In terms of family monthly income, 57.9% earn below Rs. 30,000, 24.6% fall in the Rs. 30,001– 60,000 range, 9.5% earn between Rs. 60,001–90,000, and 7.9% have an income above Rs. 90,000.

Weighted Mean and Standard Deviation Analysis

This study uses Weighted Mean Analysis to measure the average level of consumer awareness, attitude, brand–cause fit, evaluation of campaigns in brand campaigns and Sustainable purchase intention.

Table 4: Weighted Mean and standard deviation for purpose-driven campaign attributes

Sr	Factors	Weighted Mean	Standard Deviation
1	Consumer Awareness	3.94	0.31
2	Consumer Attitude	3.89	0.32
3	Brand-cause fit	3.92	0.31
4	Evaluation of AI campaigns	3.89	0.32
5	Sustainable Purchase Intention	3.81	0.34

Source: Primary data

The Table 4 represents the overall weighted mean scores for all the determinants of purpose driven brand campaigns, The overall weighted mean scores for all the factors are above 3.5 which indicates that the respondents consider all these determinants, Amongst the six factors the weighted mean score of consumer awareness is the highest as 3.94, indicating it is the most influential factor in shaping consumer response towards purpose driven brand campaigns.

Correlation Analysis

This study uses Correlation Analysis to examine the relationship between purpose-driven campaign attributes and Sustainable Purchase Intention

$H_1$1: There is a significant Relationship between Consumer Awareness and Sustainable Purchase Intention

$H_1$2: There is a significant Relationship between Consumer Attitude and Sustainable Purchase Intention

$H_1$3: There is a significant Relationship between Brand-cause fit and Sustainable Purchase Intention

$H_1$4: There is a significant Relationship between Evaluation of campaign and Sustainable Purchase Intention

Table 5: Relationship Between Purpose driven campaign attributes and Sustainable Purchase Intention

Sr	Factors	"r value"
1	Consumer Awareness and Sustainable Purchase Intention	0.600
2	Consumer Attitude and Sustainable Purchase Intention	0.698
3	Brand-cause fit and Sustainable Purchase Intention	0.620
4	Evaluation of AI campaigns and Sustainable Purchase Intention	0.746

Source: Primary data Note: **Significant @1% level

Dependent Variable: Sustainable Purchase Intention

The above table 5 shows that, At 1 % level of significance, $p < 0.01$ for Consumer Awareness (r value = .600), Consumer Attitude (r value = .698), Brand-cause fit (r value = .620), and Evaluation of AI campaigns (r value=.746). Thus, the Alternate hypotheses (H1, H2, H3, and H4) are accepted, indicating that there is a significant positive relationship between Consumer Awareness, Consumer Attitude, Brand-cause fit, and Evaluation of campaign. This implies that all these factors contribute positively to Sustainable Purchase Intention, with Evaluation of AI campaigns being the most significant.

One-Way ANOVA Analysis

This study uses ANOVA to analyze the variations in consumers' perception across various common causes featured in brand campaigns.

$H_0$5: There is no significant differences in consumers awareness across the different common causes in brand campaigns.

$H_0$6: There is no significant differences in Consumer Attitude across the different common causes in brand campaigns

$H_0$7: There is no significant differences in Brand-cause fit across the different common causes in brand campaigns

$H_0$8: There is no significant differences in Evaluation of campaign across the different common causes in brand campaigns

Table 6: ANOVA for Attributes and common causes in the brand campaigns

		Sum of Squares	df	Mean Square	F	Sig.
Consumer Awareness	Between Groups	10.682	3	3.561	.566	.639
	Within Groups	767.643	122	6.292		
	Total	778.325	125			
Consumer Attitude	Between Groups	16.600	3	5.533	.925	.431
	Within Groups	729.939	122	5.983		
	Total	746.540	125			
Brand-cause fit	Between Groups	16.555	3	5.518	1.694	.172
	Within Groups	397.318	122	3.257		
	Total	413.873	125			
Evaluation of campaign	Between Groups	13.372	3	4.457	.689	.560
	Within Groups	788.985	122	6.467		
	Total	802.357	125			

Source: Primary data

T-test

This study uses a t-test to compare if consumer perceptions of brand campaign attributes differ based on gender.

Sr	Factors	t	Sig 2 tailed
1.	Consumer Awareness	0.605	0.546 (NS)
2.	Consumer Attitude	0.000	1.000 (NS)
3.	Brand-cause fit	1.078	0.283 (NS)
4.	Evaluation of campaign	0.949	0.344 (NS)

Source: Primary data

Table 6 indicates that across all the factors, Consumer Awareness, Consumer Attitude, Brand-cause fit, and Evaluation of AI campaigns, the p-values exceed 0.05. Thus, the null hypotheses ($H_0$5 – $H_0$8) are accepted, which means that there were no significant differences in the responses regarding Gender in the t-test and type of cause in the ANOVA. The responses of both genders, as well as the main causes, were similar across all the mentioned variables.

Structural Equation Model (Sem) on Purchase Intention of Consumers

In this paper, SEM is applied to examine the moderating effect between purpose driven campaign attributes and sustainable purchase intentions of consumers. For the purpose of testing the model fit, null hypothesis and alternative hypothesis are framed.

- Null hypothesisH_0: The hypothesized model has a good fit.
- Alternate hypothesisH_1: The hypothesized model does not have a good fit.

The variables used in the structural equation model are:

I. Observed, endogenous variables

1. Evaluation of AI campaigns
2. Sustainable Purchase Intention

II. Observed, exogenous variables

1. Consumer Awareness
2. Consumer Attitude
3. Brand Cause Fit

III. Unobserved, exogenous variables

1. e1: Error term for Evaluation of AI campaigns
2. e2: Error term for Sustainable Purchase Intention

Hence number of variables in the SEM is

Number of variables in model : 7
Number of observed variables : 5
Number of unobserved variables : 2
Number of exogenous variables : 5
Number of endogenous variables : 2

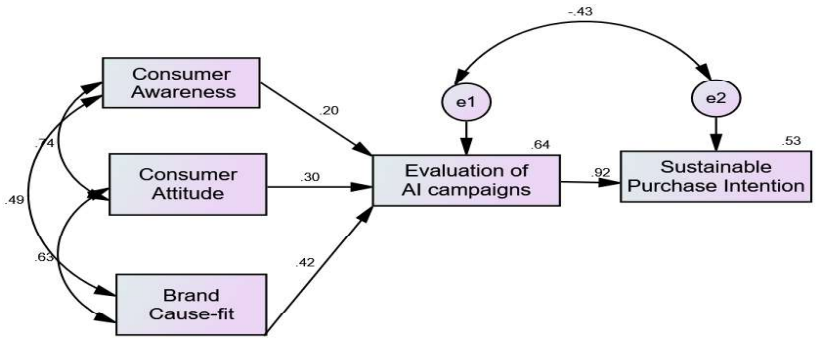


Figure No.1 Structural Equation Model (SEM) based on Standardised Coefficient on Purchase Intention of Consumers

Table 7: Variables in the Structural Equation Model Analysis							
Variables			Unstandardised co-efficient (B)	S.E of B	Standardised co-efficient (Beta)	t value	P value
Evaluation of AI campaigns	<--	Consumer Attitude	0.311	0.085	0.300	3.647	<0.001**
Evaluation of AI campaigns	<--	Consumer Awareness	0.207	0.074	0.204	2.807	<0.001**
Evaluation of AI campaigns	<--	Brand Cause Fit	0.584	0.089	0.420	6.582	<0.001**
Sustainable Purchase Intention	<--	Evaluation of AI campaigns	0.782	0.065	0.922	11.992	<0.001**

** denotes significant at 1% level

From the Table 7, Unstandardised coefficient of Consumer Attitude on Evaluation of AI Campaigns is 0.311 represents the partial effect of Consumer Attitude on Evaluation of AI Campaigns, holding the other path variables as constant. The estimated positive sign implies that such effect is positive that Evaluation of AI Campaigns would increase by 0.311 for every unit increase in Consumer Attitude and this coefficient value is significant at 1% level.

Unstandardised coefficient of Consumer Awareness on Evaluation of AI Campaigns is 0.207 represents the partial effect of Consumer Awareness on Evaluation of AI Campaigns, holding the other path variables as constant. The estimated positive sign implies that such effect is positive that Evaluation of AI Campaigns would increase by 0.207 for every unit increase in Consumer Awareness and this coefficient value is significant at 1% level.

Unstandardised coefficient of Brand Cause-fit on Evaluation of AI Campaigns is 0.584 represents the partial effect of Brand Cause-fit on Evaluation of AI Campaigns, holding the other path variables as constant. The estimated positive sign implies that such effect is positive that Evaluation of AI Campaigns would increase by 0.584 for every unit increase in Brand Cause-fit and this coefficient value is significant at 1% level.

Unstandardised coefficient of Evaluation of AI Campaigns on Sustainable Purchase Intention is 0.782 represents the partial effect of Evaluation of AI Campaigns on Sustainable Purchase Intention, holding the other path variables as constant. The estimated positive sign implies that such effect is positive that Satisfaction would increase by 0.782 for every unit increase in Expectation and this coefficient value is significant at 1% level.

Based on Standardised coefficient, Evaluation of AI campaigns on Sustainable Purchase Intention (0.922) is most influencing path in this SEM model, followed by Brand Cause Fit on Evaluation of AI campaigns (0.420), Consumer Awareness on Evaluation of AI campaigns (0.379) and so on.

Table 8: Model fit summary of Structural Equation Model		
Indices	Value	Suggested value
Chi-square value	2.247	-
DF	2	-
P value	0.120	>0.05
Chi-square value/DF	2.124	<5.00
GFI	0.987	>0.90
AGFI	0.901	>0.90
NFI	0.949	>0.90
CFI	0.994	>0.90
RMR	0.076	<0.08
RMSEAX	0.079	<0.08

From the Table 8, it is found that the calculated P value is 0.120 which is greater than 0.05 which indicates perfectly fit. Here Goodness of Fit Index (GFI) value (0.987) and Adjusted Goodness of Fit Index (AGFI) value (0.901) is greater than 0.9 which represent it is a good fit. The calculated Normed Fit Index (NFI) value (0.949) and Comparative Fit Index (CFI) value (0.994) indicates that it is a perfectly fit and also it is found that Root Mean square Residuals (RMR) and Root Mean Square Error of Approximation (RMSEA) value is 0.079 which is less than 0.08 which indicated it is perfectly fit.

Findings and Discussion

The study gives a clear picture of AI-based purpose-driven brand campaigns work and the influence of people's willingness to buy. All five factors - consumer awareness (mean 3.94), consumer attitude (mean 3.89), brand–cause fit (mean 3.92), evaluation of the campaign (mean 3.89), and sustainable purchase intention (mean 3.81) - scored well above average (3.5), showing that people see all of them as important. Of these, consumer awareness had the highest score (3.94), which matches earlier research by Lafferty et al. (2004) and Gupta & Pirsch (2006) showing that people respond better when they understand and trust the connection between a brand and the cause it supports.

Correlation analysis shows a strong positive link between all factors and sustainable purchase intention, with significance at the 1% level ($p < 0.01$). The strongest link was for moral pleasure for participation ($r = 0.844$), meaning the good feeling people get from supporting a cause is a major driver for purchase decisions. This supports Tsai (2009) and Roy (2010), who found that moral and altruistic motivations boost consumer support for CRM campaigns.

The ANOVA results show no significant differences (p values all above 0.05) in perceptions of any factor across different types of causes. Similarly, the t-test results show no significant differences between genders (p-values all above 0.05). This suggests that purpose-driven campaigns appeal equally to different demographic groups, echoing Wymer's (2013) view that authenticity and brand–cause fit matter more than demographic differences.

From the SEM model, based on unstandardized it was discovered that consumer attitude (0.311), Consumer awareness (0.207) and brand cause fit (0.584) have a positive influence on assessment of AI Campaigns. Among them, brand cause-fit has the greatest influence. It is also evident in the findings that Evaluation of AI campaigns (0.782) has a

influence on sustainable purchase intention. Based on standardized, SEM model shows that the relationship between assessment of AI Campaigns and sustainable intention (0.922) has the strongest impact followed by brand cause-fit (0.420), consumer attitude (0.300) and consumer awareness (0.204).

Practical Implications

- AI Campaigns should focus on creating strong consumer awareness by clearly communicating the cause and its connection to the brand to build trust and interest.
- An emotional appeal that gives consumers a sense of pride and moral satisfaction can encourage stronger participation and support.
- Selecting causes that align closely with the brand's values helps maintain authenticity and credibility.
- Since the appeal is consistent across demographic groups, campaigns can be designed for broad reach without heavy customization.

Future Scope of Research

Future research can look at AI-based purpose-driven brand campaigns influence not just the first purchase but also repeat buying habits, which is important for building long-term sustainable purchase intention, and can compare consumer responses between local and global causes to understand which type connects more deeply with audiences. Researchers can also compare how younger and older generations respond to eco-friendly versus social causes to see which drives stronger sustainable purchasing.

Conclusion

AI-based Purpose-driven brand campaigns show that marketing can be more than selling products, it can inspire people to make choices that benefit society and the environment. When a brand connects its values with a meaningful cause, it creates trust and builds stronger relationships with consumers. These campaigns are stand out because they appeal to people of all ages, genders, and backgrounds. Purpose speaks a universal language, and when brands express it with honesty, it connects across every group. The future of business rests firmly on authenticity, transparency, and responsibility. In the end, consumers no longer buy products alone they also buy values, emotions, and impact. Brands that stay true to a genuine purpose can transform simple purchases into meaningful actions and move from being just sellers to becoming agents of social change.

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South Asian Journal of
Participative Development

Vol.25, No.2 (Spl.), July - Dec. 2025
ISSN No: 0976-2701

The Influence of AI Chatbot Services on Customers' Purchase Intention in Quick Commerce Platforms: An Expectation- Confirmation Model Approach

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Abstract

The fast development of Artificial Intelligence (AI) technologies has brought major changes across industries, especially quick commerce platforms, where businesses use AI tools to improve customer engagement and user experience towards quick commerce. This study explains the AI chatbot services influence the consumer purchase intention in Q-commerce by using Expectation-Confirmation Model (ECM). The objective of this study aims to assess the impact between AI Chatbot services, confirmation, trust, and purchase intention in Quick commerce platforms.

This research addresses gap on understanding the influence of AI chatbot service in the quick commerce platforms. When many studies are focusing more on the role of AI in all the fields, there is very limited studies on AI chatbot services in Q-commerce. This study employs Structural Equation Model (SEM) to analyse data collected from 233 online customers by using the purposive sampling technique. The findings reveal that AI Chatbot services positively influence users' confirmation which in turn positive effect on trust and Purchase Intention. Furthermore, AI chatbots service showing a stronger influence on trust and purchase intention. This study contributes to understanding the customers' perception and behaviours in AI chatbots interactions within quick commerce platforms. The implications of this study for AI technology developers and Q-commerce companies are discussed, emphasizing it is need to focus on enhancing the chatbot service and user-friendliness to foster long-term studies about customers' retention.

Keywords: Artificial Intelligence, Quick commerce, AI Chatbots Service, Confirmation, Trust, Satisfaction, Purchase intention

Introduction

The rapid advancement of artificial intelligence (AI) technologies has significantly transformed customer service and engagement across various industries. (Alexandra Rese, 2020) highlights the chatbots also known as conversational agents, are artificial intelligence (AI) systems designed to simulate human-like interactions through text or voice- based communication. In modern AI chatbots powered by Large Language Models (LLMs), are increasingly deploying in quick commerce platforms to provide instant, personalized assistance to consumers (Yuan et al, 2022) This study marked an important step in understanding the adoption of chatbots as innovative tools for enhancing customer

engagement. Later, AI- based chatbots is useful to operate, reliability, and ability to enhance customer service operations. According (Ng & Lin, 2022) chatbot improve the problem-solving capabilities, enable consumers to inquire about the product details, shipping, pricing etc with immediate responses. The importance of conversational style in building customer engagement and loyalty through AI chatbots in e-commerce (Li et al., 2022).

This study focuses on understanding the effectiveness of AI Chatbots influence customers' purchase intention is essential for optimizing their deployment. The Expectation- Confirmation Model (ECM) provides a valuable framework for examining the trust drives by the Chatbots service affect their customers' purchase intentions. AI customer service technology plays a crucial role in enhancing the user experience by addressing issues from consumer while shopping online, thus AI improve efficiency and automation in customer interactions between quick commerce platforms and customers (Prentice et al.,2020) and adoption of AI in commerce not only supports customer service but also directly shapes value perceptions critical to purchasing decisions (Li et al., 2022). This research focus enable better understanding customer opinions on Q-commerce platforms type AI chatbots service. That understanding can help the program developers of quick commerce companies improve the service quality and content of their AI chatbots, improve user trust with AI customer service in Q-commerce platforms.

Literature review

2.1 Expectation- Confirmation Theory

The ECM model focuses on evaluating a users' purchase intention as Fig. 1. ECM can be used to explain the customer willingness to purchase by using AI chatbots service in an q-commerce platform. (Bhattacherjee, 2001) found that causal relations between technology and service is adopted to analyse the consumer willingness to purchase. Based on AI chatbots service expectation-confirmation model between expectations and concepts. Therefore ECM developed to identify the customer expectations when using AI chatbot service and compare these expectation to their actual experience. If the chatbots performance meets or exceeds expectations (confirmation), customers feel satisfied and are more likely to continue using service. This theory can be useful to identify the customer level of acceptance behaviour through continue usage (Mishra et al, 2023). As Hsu and Lin 2015 explains, confirmation between expectation and actual performance of using service.The confirmation factors plays a key role in consumer trust with service, while trust relates to consumer purchase intention.

In modern technology, AI- based q-commerce has emerged as a viable alternative to traditional customer service (Wang et al., 2022). AI technology have significantly enhanced customer service efficiency through AI-powered chatbots.These chatbots offer 24/7 supportive system, handling the customer tasks like FAQs, which providing product recommendations, and resolving basic issues. As AI chatbots become integral to quick commerce platforms, they served as tools that human employees, taking on an increasing share of customer service tasks (Ruan and Mezei, 2022). In different perception that leads to disappointment before and after use, the feeling of confirmation would need to be improved (Hsieh, 2020). As explored the link between commerce and trust, denote how

trust drive purchase behaviour while Manzoor et al. 2020 says that trust has positive impact businesses on social networking.

Research design and methodology

3.1 Questionnaire design

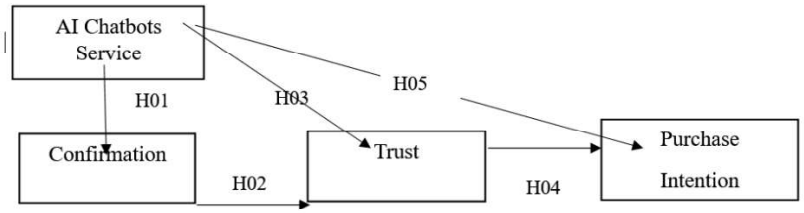
This research follows a two- part questionnaire, the first part talks about the demographical profile of the respondents, followed by measuring factors related with AI Chatbot Services and Customers' Purchase Intention. The first part has four questions about basic information of the respondents, including gender,age,education and income. The second part has 12 statements, and each question was measured using the seven-point Likert Scale, ranging from (1) Strongly Disagree to (5) Strongly Agree. All these were adapted from the existing studies as follows:

Constructs	Sources
AI Chatbots Service Confirmation	Gao, J., et al, (2025)
Trust Purchase Intention	Syarifudin, M., et al, (2024)

Data collection and sample size

The questionnaire was tested using purposive sampling, a non- random sampling method commonly used for participant selection in research. The data collection was conducted in Chennai city from 233 online consumers. For this research quantitative analysis takes place to test the weighted mean and SEM model.

Fig.1. Research model



Results

4.1 Data analysis

This study was conducted by using statistical analysis with SPSS and AMOS. Specifically, SPSS was used to analyse the reliability using Cronbach's Alpha (Anderson and Gerbing, 1998)**,** while AMOS was used to construct the Structural Equation Model. the reliability test with an overall values threshold of 0.828, means that data are highly good and reliable.

Table 4.1.1. Reliability Test

Cronbach's Alpha	No. of items
0.828	15

Table 4.1.2. Survey respondents

Measure	Categories	Frequency	%
Gender	Male	145	62.2%
	Female	88	37.8%
Age	Below 20	57	24.5%
	20-30	84	36.1%
	31-40	65	27.9%
	Above 40	27	11.6%
Education level	High School	57	24.5%
	Under graduate	98	42.1%
	Post graduate	63	27%
	Others	15	6.4%
Family Annual Income	Rs.2,00,000-3,00,000	57	24.5%
	Rs.3,00,001-4,00,000	70	30%
	Rs.4,00,001-5,00,000	82	35.2%
	Above Rs.5,00,000	24	10.3%

Table 4.1.3. Weighted Mean for all the factors

Factors	Weighted Mean
AI Chatbots Service	3.61
Confirmation	3.65
Trust	3.71
Purchase Intention	3.61

Hypotheses testing

In this study the model has tested with Structural Equation Model it is a statistical modelling technique emphasizing the examination of relationships among variables; it is well-suited for analysing models with large sample sizes (Bagozzi et al, 1991). In this study, we developed an AI chatbot service ECM research model under the AI Chatbots characteristics in Q-commerce and investigated the purchase intention among consumers. Through the integration of variables not previously addressed in research with ECM, we formulate a novel model with AI Chatbots service, and SEM analysis was carried out to examine the structural model and test the hypotheses in this study.

Null Hypotheses

H_{01-05}: There is no significant impact between AI Chatbots service, Confirmation, Trust and Purchase intention.

Structural Equation Model

Structural Equation Model (SEM) is a multivariate statistical technique used to test and estimate complex relationships among observed and latent variables. It integrates factor analysis and path analysis to evaluate theoretical models and their fit to empirical data (Daire et al., 2008).

The variable used in SEM are;

- Observed, endogenous variables: Confirmation, Trust, Purchase Intention
- Unobserved, exogenous variable: AI Chatbot Services
- Unobserved, exogenous variables:
  e1: Error term for Confirmation
  e2: Error term for Trust
  e3: Error term for Purchase Intention

Hence number of variables in the SEM is

Number of variables in model	:	7
Number of observed variables	:	4
Number of unobserved variables	:	3
Number of exogenous variables	:	4
Number of endogenous variables	:	3

Fig.2. Structural Equation Model (SEM) based on Unstandardised Coefficient on Customers' Purchase Intention

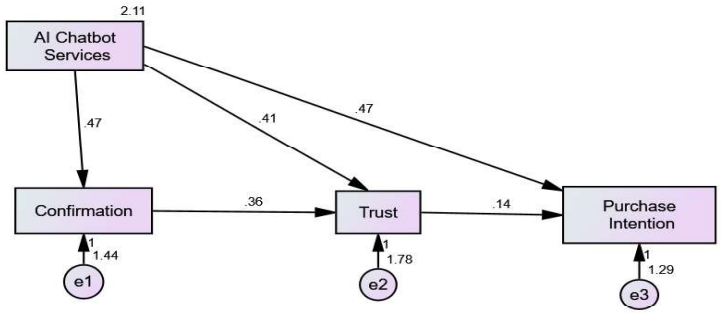


Table 4.3.1. Variables in the Structural Equation Model Analysis

Variables	Unstandardised co-efficient (B)	S.E. of B	Standardised co-efficient (Beta)	t-value	P value
C <--- ACS	0.465	0.054	0.490	8.570	<0.001**
T <--- C	0.357	0.073	0.302	4.894	<0.001**
T <--- ACS	0.406	0.069	0.362	5.870	<0.001**
PI <--- T	0.140	0.053	0.162	2.630	<0.001**
PI <--- ACS	0.471	0.060	0.488	7.902	<0.001**

Note: ** denotes significant at 1%, ACS- AI Chatbot service, C- confirmation, T-trust, PI- Purchase intention

From the above table, Unstandardised coefficient of AI Chatbot services on confirmation is 0.465 represents the partial effect of AI chatbot services on confirmation, holding the other path variables as constant. The estimated positive sign implies that such effect is positive that confirmation would increase by 0.465 for every unit in AI chatbot services and this coefficient value is significant at 1% level.

The unstandardized coefficient of Confirmation on trust is 0.357, indicating a statistically significant positive effect at the 1% level. This coefficient reflects that partial effect of confirmation on trust, controlling for other variables in the structural model. Specifically, a one-unit increase in confirmation is associated with a 0.357 unit increase in trust.

Unstandardised coefficient of AI Chatbot services on trust is 0.406 represents the partial effect of AI chatbot services on trust, holding the other path variables as constant. The estimated positive sign implies that such effect is positive that trust would increase by 0.406 for every unit in AI chatbot services and this coefficient value is significant at 1% level.

Unstandardised coefficient of Trust on Purchase Intention is 0.140 represents the partial effect of Trust on Purchase intention, holding the other path variables as constant. The estimated positive sign implies that such effect is positive that Purchase Intention would increase by 0.406 for every unit in Trust and this coefficient value is significant at 1% level.

Unstandardised coefficient of AI Chatbot Services on Purchase Intention is 0.471 represents the partial effect of AI Chatbot Services on Purchase Intention, holding the other path variables as constant. The estimated positive sign implies that such effect is positive that Purchase Intention would increase by 0.471 for every unit in AI Chatbot Services and this coefficient value is significant at 1% level.

Based on Standardised coefficient, AI Chatbots Service on Confirmation (0.490) is most influencing path in this SEM model, followed by AI Chatbots Service on Purchase Intention (0.488), and so on.

Testing The Model Fit

Hypothesis X

Null hypothesis: The model has a good fit.

Alternate hypothesis: The model does not have a good fit.

Table 4.3.2. Model Fit Summary of SEM

Items	Value	Suggested value
P value	0.071	>0.05 (Hair et al., 1998)
Chi-square value/DF	3.266	< 5.00 (Hair et al., 1998)
GFI	0.993	> 0.90 (Hair et al., 2006)
AGFI	0.931	> 0.90 (Daire et al., 2008)
NFI	0.987	≥ 0.90 (Hu and Bentler, 1999)
CFI	0.991	> 0.90 (Hu and Bentler, 1999)
RMR	0.048	< 0.08 (Hair et al., 2006)
RMSEA	0.099	< 0.08 (Hair et al., 2006)

In the above table, it is found that the p value is 0.071 which is greater than 0.05, which indicates perfectly fit. Here the Goodness of Fit Index (GFI) value (0.993) and Adjusted Goodness of Fit Index (AGFI) value (0.931) is greater than 0.90 which represent is a good fit. The value (0.987) for Normal Fit Index (NFI) and Comparative Fit Index (CFI) value (0.991) indicate that it is a perfectly fit. The Root Mean Square Residuals (RMR) value

0.048 which is less than 0.08 which is perfect fit and Root Mea Square Error of Approximation (RMSEA) value is 0.099 which indicate it is marginal fit.

Discussion and Conclusion

Summary of findings

The primary objective of the present study was to understand the customers' purchase intention to use AI chatbots in quick commerce. This investigation has been applied in SEM and ECM. Hence, table 4.1.2 shows that there is a gender differences in online purchasing where males (62.2%) tend to adopt the AI technology for efficiency, while the females (37.8) seek personalized AI interactions. This suggests that the male majority highlights that AI chatbots tailored to gender preference can increase purchase intention.ma It also found that younger consumers (36.1%), are more engaged with AI chatbots in quick commerce due to their preference for convenience and interactive experiences**.** According to (Tutar, H. 2024) higher education (42.1) correlate with greater digital literacy and acceptance of AI technologies, boosting consumer confidence in AI recommendations, it implying that (Acikgoz, Y., Koc., & Nitzsche, J. 2024) emphasize that middle- income (35.2%) consumers in developed countries especially value AI-driven features such as tailored discounts and efficient service, which influence on AI-enabled towards purchase intention.

In table 4.1.3, it indicates weighted mean factors, Among them trust (3.71) is the strongest perception followed by other factors. Li, M., & Wang, R. (2022) demonstrated the trust and confirmation developed through AI chatbot interactions significantly boost purchase intentions by improving the users experience and perception. It also highlights the importance of personalized chatbot recommendations, enhancing consumer engagement and purchase intention. The hypotheses were tested using Structural Equation Model (SEM). The results of the structural model analysis are presented in Figure 2 and table 4.3.1. The findings indicate that there is a significant impact between AI Chatbots service, Confirmation, Trust and Purchase Intention. Since the p value is lesser than 0.01, the null hypotheses is rejected at 1% level of significant.

Conclusion

In this fast development of AI technology plays a vital role in quick commerce especially AI tools like chatbots which provide service to the customers. It helpful to business to develope their strategic to retain the customer purchase decision. This study, indicates that there is a significant impact between AI Chatbot services, Confirmation, Trust and Purchase Intention. Therefore, most consumer perceive using AI chatbots can effectively address the issues encountered while shopping in quick commerce platforms. However, the process of using AI chatbots service positively influence on confirmation, trust and purchase intention. Additionally, the confirmation effect on trust and it also has positive impact on purchase intention. The problem solving is the ability of AI Chatbot customer service to accurately understand and solve each customers' problem immediately Sadhu et al (2024). Effectively designing the AI chatbots would not only drive customers satisfaction but also boost purchase intention among consumer (Rane et al., 2023).

1. Practical Implications

This research also has several practical implications for both AI developers and companies providing customer service. The findings of this study, suggest that AI chatbots service directly and indirectly influencing on confirmation, trust and purchase intention. While AI chatbots should be focus on improving accuracy, response speed, personalized and problem-solving capabilities. The role of AI chatbots service not only more effective in addressing customer issues than human customer service but also more efficient and cost-effective. Furthermore, this research shows that quick commerce providers can organise chatbot training programs which helps to boost their utility and accuracy of chatbots, enhancing the effectiveness in solving the customer issues. This study guidance to the marketer to develop their strategy towards AI Chatbots Service which helps foster long-term studies about customers' retention in quick commerce platforms.

7. Limitations and Future Research

This research has several limitations. First, while the study about the impact of variable attributes on consumers' intentions to purchase by using chatbots service, is primarily focused on customer service support. Future research should conduct a more detailed examination of the capabilities of AI chatbots. Secondly, this study mainly targets chatbots on quick commerce platforms. Unlike chatbots used in healthcare, education and the digital economy, the findings may have limited generalizability. Thirdly, although the total sample size of 233 usable responses is adequate for research, it also suggests large sample size for constructing SEM techniques, as noted by Kyriazos (2018). The Future research can also consider custom-centric emotions (human emotions like angry vs calm) the attributes of chatbots. This study relates customer perception and behaviour rather than experimental manipulation. In addition, we conduct the research in Chennai cities, but it can differs from other geographical area. Further researcher can include various mediator factors like satisfaction, perceived ease of use, as noted by (Gao.J et al., 2025). This study also suggests conducting case studies and longitudinal studies about new AI applications influence customer perception and engagement in Quick commerce platform.

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South Asian Journal of Participative Development
Vol.25, No.2 (Spl.), July - Dec. 2025
ISSN No: 0976-2701

Exploring the Scope of Artificial Intelligence in Special Education: Opportunities and Emerging Directions

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Abstract

This review synthesises evidence from 35 peer-reviewed studies published between 2020 and 2025 to examine how Artificial Intelligence (AI) is being integrated into special and inclusive education. The analysis focuses on key AI applications—including adaptive learning systems, natural language processing, computer-vision tools, and assistive communication technologies—and evaluates their impact across disability groups such as autism, dyslexia, ADHD, sensory impairments, and learning disabilities. Across the studies, AI consistently supports personalised instruction, accessibility enhancement, communication assistance, and socio-emotional skill development. However, limited teacher preparedness, infrastructural constraints, cost barriers, data-privacy concerns, and algorithmic bias continue to restrict sustainable implementation. Four themes emerged from the thematic analysis: personalised/adaptive learning, communication and accessibility, behavioural and socio-emotional support, and professional/ethical challenges. Guided by Pagliara et al.'s (2024) framework, the review emphasises that AI's educational impact depends on the alignment between technological design, pedagogical context, learner needs, and inclusive values. The findings suggest that while AI holds strong potential to enhance equitable learning opportunities, its effective adoption requires rigorous evaluation, culturally responsive design, capacity building, and robust ethical governance.

Keywords: Artificial Intelligence, Special Education, Inclusive Education, Adaptive Learning, Assistive Technology

Introduction

Artificial Intelligence (AI) has rapidly shifted from experimental computer science into a central component of contemporary educational ecosystems. Over the last decade, accelerated developments in machine learning, natural language processing (NLP), computer vision, and adaptive analytics have reshaped how instructional content is

delivered, monitored, and personalised. These shifts are particularly significant for special and inclusive education, where learners often require differentiated instruction, multimodal supports, and continuous feedback tailored to individual strengths and challenges. Global policy commitments—including the Sustainable Development Goal 4 (SDG-4) on equitable education—have further amplified interest in leveraging AI to address persistent gaps in accessibility, participation, and learning outcomes among neurodiverse learners.

Recent research demonstrates that AI applications are increasingly used to support students with autism spectrum disorder (ASD), dyslexia, attention-deficit/hyperactivity disorder (ADHD), sensory impairments, intellectual disabilities, and multiple learning difficulties. Across these studies, four categories of AI tools appear consistently: adaptive learning systems that adjust content and pacing; NLP-based tools such as speech-to-text, text-to-speech, and automated feedback systems; computer-vision applications designed to enhance accessibility for learners with visual or motor impairments; and affective or behavioural AI systems, including emotion-recognition tools and social robots. Evidence from empirical and conceptual studies suggests that these tools can enhance learner engagement, support communication, improve accessibility, and strengthen socio-emotional learning when used alongside appropriate pedagogical strategies.

Despite these emerging benefits, the current evidence base remains fragmented and uneven. Many studies rely on small sample sizes, short intervention durations, and limited assessment measures, making it difficult to generalise findings across contexts. Additionally, the rapid pace of AI development has outstripped the capacity of many education systems to integrate these tools responsibly. Teachers and therapists frequently report low preparedness, limited confidence in AI-based tools, and inadequate institutional support. Infrastructure constraints—such as poor internet connectivity, device shortages, and high-cost technologies—pose further barriers, especially in low-resource or rural settings. Ethical concerns, including data privacy risks, algorithmic bias, lack of transparency, and potential misuse of learner data, remain major challenges that current research has only partially addressed.

Another gap in existing literature is the lack of integrative analyses that synthesise cross-cutting patterns across disability groups, AI technologies, and pedagogical contexts. Many reviews focus on a single condition (e.g., autism), a specific technology (e.g., emotion-recognition systems), or a narrow regional context (e.g., high-income countries). As a result, there is limited understanding of how AI tools collectively contribute to inclusive educational practices, what common barriers persist across settings, and how these technologies can be implemented sustainably and ethically. Moreover, there is a notable absence of reviews that explicitly apply conceptual frameworks to interpret the interaction between technology, pedagogy, learner needs, and inclusion.

This review addresses these gaps by synthesising findings from 35 peer-reviewed studies published between 2020 and 2025, covering a broad range of disabilities, educational contexts, and AI applications. The goal is to provide a consolidated, thematic understanding of how AI is currently being deployed in special and inclusive education, what educational outcomes are being reported, and what systemic challenges limit sustainable adoption. By analysing these studies through the conceptual model proposed

by Pagliara et al. (2024)—which situates AI within the interaction of educational context, learner needs, technological design, and inclusive values—this review offers a structured interpretation of cross-cutting trends and emerging directions.

The specific objectives of this review are:

1. To map the range of AI technologies currently used in special and inclusive education between 2020 and 2025.
2. To synthesise evidence on the pedagogical, communicative, and accessibility-related outcomes reported across disability groups.
3. To identify recurring barriers, ethical concerns, and implementation challenges across diverse educational settings.
4. To interpret thematic patterns using an established conceptual framework and highlight implications for research, practice, and policy.

By addressing these objectives, this review aims to expand current understanding of AI's role in supporting diverse learners, clarify the conditions under which AI contributes meaningfully to inclusive education, and outline priorities for future research and practice. The remainder of this paper is organised as follows: the Methodology outlines the review procedures; the Results and Thematic Findings present the major patterns identified across the included studies; the Discussion integrates these findings with existing scholarship; and the Conclusion summarises implications for policy, practice, and future research.

Methodology

Research Design

This study employed a qualitative content analysis design, supported by thematic analysis as described by Braun and Clarke (2006). This approach was selected because it allows for a nuanced interpretation of textual data and helps uncover patterns and meanings across diverse studies. Rather than quantifying frequencies, the analysis aimed to identify and interpret conceptual trends in how Artificial Intelligence (AI) is being utilized to support learners with special educational needs. The design was considered appropriate because AI in special education is a rapidly evolving and multidisciplinary field where existing research remains fragmented. A qualitative approach provided the flexibility to integrate empirical, conceptual, and review-based evidence to form a coherent understanding of emerging directions and challenges.

Data Sources and Selection Criteria

A total of 35 peer-reviewed journal papers published between 2020 and 2025 were purposefully selected for analysis. The selection focused on recent research to ensure that findings reflected contemporary developments in AI technologies and their pedagogical applications.

The search strategy included databases such as Google Scholar, Scopus, Web of Science, and ResearchGate, using combinations of keywords: "Artificial Intelligence," "special education," "inclusive education," "assistive technology," "machine learning," "adaptive learning," and "neurodiverse learners."

The inclusion criteria were:

- Studies published in peer-reviewed journals between 2020–2025.
- Studies focusing on AI applications in special or inclusive education contexts.
- Empirical, conceptual, or systematic review studies available in English.

Exclusion criteria included:

- Non-peer-reviewed sources (blogs, reports, or news articles).
- Studies not directly addressing education or disability contexts.
- Papers without accessible abstracts or full texts.

After initial screening and removal of duplicates, 39 studies were finalized for full-text review and qualitative coding.

Data Extraction and Organization

A structured data extraction sheet was created in Microsoft Excel to organize relevant information from each study. The following categories were recorded: (1) Title of the study, (2) Year of publication, (3) Type of AI technology used, (4) Target learner group or disability category, (5) Key findings or educational outcomes, and (6) Identified barriers or limitations.

Each paper was read several times to ensure a comprehensive understanding of its objectives, methods, and outcomes. The extracted data served as the foundation for thematic analysis and comparison across studies.

Data Analysis Procedure

The data were analysed qualitatively through thematic analysis, guided by Braun and Clarke's (2006) six-phase framework. This process involved:

1. Familiarization with data: All selected studies were read and annotated to gain an in-depth understanding of their focus areas.
2. Generating initial codes: Key concepts such as "AI-driven personalization," "accessibility," "teacher training," "data privacy," and "infrastructure barriers" were noted.
3. Searching for themes: Similar codes were clustered to form preliminary categories such as AI Tools and Applications, Learner Focus and Educational Contexts, Pedagogical Benefits, and Barriers and Ethical Challenges.
4. Reviewing themes: Codes and categories were refined for internal consistency and distinctiveness.
5. Defining and naming themes: Final thematic constructs were established to represent the collective findings across the dataset.
6. Producing the report: The results were narratively synthesized into descriptive themes, integrating insights and examples from multiple studies.

Throughout the analysis, manual coding and memo writing were used to ensure reflexivity and transparency in interpretation.

Trustworthiness and Rigor

To enhance credibility, multiple readings and iterative coding were performed. Patterns and interpretations were repeatedly compared across studies to ensure dependability. The inclusion of both empirical and conceptual papers allowed for methodological triangulation, enriching the interpretive validity of the findings. Research transparency was maintained by keeping an audit trail of inclusion decisions and coding notes.

Ethical Considerations

As this research utilized publicly available secondary data, no institutional ethical clearance was required. However, ethical integrity was maintained by adhering to academic honesty, proper citation, and avoidance of plagiarism. Care was taken to accurately represent the original authors' ideas and ensure objective interpretation of their work.

Thematic analysis was conducted manually following Braun and Clarke's (2006) six-phase approach, with codes and patterns organized using Microsoft Excel.

Result and findings

Overview of Included Studies

A total of 35 studies published between 2020 and 2025 met the inclusion criteria and were included in this review (Table 1). The search initially returned over 200 records; after screening for relevance to AI applications in special and inclusive education, removing duplicates and non-peer-reviewed items, 35 studies remained for full qualitative analysis. The final sample comprised both empirical studies and conceptual/review papers drawn from diverse geographic contexts (Asia, Europe, North America and others). Publication frequency increased markedly after 2021, with the bulk of papers published in 2023–2024 (see Figure 1).

Table 1. Summary of the studies included

No.	Author(s) & Year	Title / Focus Area	AI Type / Application	Target Group	Key Finding
1	Rodríguez Torres et al. (2023)	Use of AI to Improve the Teaching-Learning Process in Children with Special Abilities	Adaptive learning systems; intelligent tutoring; text-to-speech	Physical, visual, hearing, learning disabilities	Enhanced autonomy, participation and accessibility via personalized tools
2	Pagliara et al. (2024)	The Integration of AI in Inclusive Education: A Scoping Review	Adaptive learning; assistive tech; speech ↔ text	ADHD, dyslexia, autism	AI improves inclusivity by enabling personalized, assistive supports
3	Artificial Intelligence-Driven Transformation in Special Education (2024)	Optimizing Software for Improved Learning Outcomes	Machine learning; NLP; predictive analytics	Visual-processing difficulties	Real-time, data-driven feedback improved academic and behavioural outcomes
4	Deckker & Sumanasekara (2025)	Systematic Review on AI in Special Education	Adaptive learning; VR/AR; gamification	ASD, ADHD, dyslexia	Individualized AI approaches increased accessibility and motivation
5	Harkins-Brown et al. (2025)	Artificial Intelligence in Special Education	Personalized/adaptive systems	General SEN	Personalized systems can improve outcomes; need validation & oversight
6	Santos et al. (2024)	The Art of Personalization of Education	Adaptive tutoring; screen readers; image recognition	General SEN learners	Adaptive systems increase engagement and comprehension
7	Mustafa (2024)	AI for Learning Enhancement	Intelligent tutoring; analytics	Students with learning disabilities	Improved attention, motivation and tailored feedback
8	Bicen (2022)	AI in Teaching and Learning for Neurodiverse Students	Adaptive tutoring; gamified learning	Autism; ADHD	Gamified/adaptive AI boosted engagement and social communication
9	Li et al. (2022)	AI and Visual Learning Support	Computer vision; visual recognition	Visually impaired learners	Visual audio conversion increased independence and access
10	Khan et al. (2020)	Machine Learning in Inclusive Education	Predictive algorithms; learning analytics	Mixed disabilities	Early detection and individualized planning supported by analytics
11	Alharbi & Drew (2021)	Intelligent Tutoring for Dyslexic Students	NLP; speech-to-text	Students with dyslexia	NLP tools improved reading, decoding and comprehension
12	Kim & Park (2021)	AI-Based Social Robots for Autism	Assistive robotics; emotion recognition	Children with autism	Robots enhanced social interaction and emotional understanding

13	Sharma et al. (2023)	Adaptive AI Models for Inclusive Classrooms	Adaptive algorithms; data personalization	Neurodiverse students	Data-driven differentiation improved individualized instruction
14	Liu et al. (2022)	Natural Language Processing for Special Education	NLP; sentiment & text analysis	Students with learning difficulties	NLP supported language processing and feedback systems
15	Ahn & Lee (2023)	Augmented Reality and AI in Inclusive Learning	AR; image recognition	Students with mild cognitive disabilities	AR increased attention, motivation and concept retention
16	Gupta & Das (2023)	AI in Assistive Communication	Speech synthesis; predictive text	Learners with speech impairments	Improved communication and social engagement via synth. speech
17	Rahman et al. (2021)	Machine Learning to Support ADHD Students	ML-based monitoring tools	ADHD students	Adaptive attention tracking supported improved focus strategies
18	Singh et al. (2024)	Predictive Analytics for Learning Disabilities	Predictive AI; data modeling	Learning disabilities	AI enhanced early detection and tailored interventions
19	Patel & Joshi (2023)	Use of Chatbots in Inclusive Education	NLP-based chatbots	Mixed disabilities	Chatbots provided personalized guidance and interactive support
20	Brown & Chen (2022)	AI Tutoring for Emotional Support	Emotion-recognition systems	ASD; anxiety-related disorders	AI-supported emotional recognition aided regulation and engagement
21	Das et al. (2023)	AI in Multilingual Special Education	NLP; translation tools	Linguistically diverse SEN students	Improved accessibility for multilingual learners via translation/NLP
22	Kumar & Rani (2022)	Integrating AI for Visual Disabilities	Computer vision; image-to-speech	Visually impaired students	Improved mobility and independent learning through vision AI
23	Rivera et al. (2021)	Deep Learning Models in Inclusive Education	Deep learning; predictive analytics	Dyslexia; ADHD	Deep models enabled finer-grained personalization and tracking
24	Li & Zhao (2023)	Robotics in Special Education	Interactive robotics	ASD learners	Robotics increased classroom participation and engagement
25	Singh & Chandra (2024)	Adaptive AI in Indian Inclusive Schools	Adaptive systems	Diverse disabilities	Showed cultural adaptability and improvements in engagement
26	Wang et al. (2022)	AI for Autism Therapy	Behavioral AI systems	Children with autism	Behavioral AI improved emotional response and communication outcomes
27	Zhang et al. (2023)	Integrating AI with Special Education Curriculum	Adaptive AI design	Mixed disabilities	Adaptive design improved differentiation and outcome monitoring
28	Tan & Woo (2024)	AI Support for Executive Functioning	Cognitive AI tools	ADHD; ASD students	Cognitive support tools improved planning and task management
29	Kim et al. (2023)	AI-Enhanced Assessment for Dyslexia	Eye-tracking; ML algorithms	Dyslexia	Improved diagnostic accuracy and intervention planning
30	George & Raj (2024)	AI in Inclusive Classrooms in India	Adaptive AI; text-to-speech	Learning and physical disabilities	Improved participation and teacher support in classroom settings
31	Ali & Noor (2021)	Use of VR-AI for Behavioural Learning	VR; reinforcement AI	ASD	VR improved social behaviour and communication in therapeutic settings
32	Patel et al. (2024)	AI Tools for Hearing Impairments	Speech recognition; visual captions	Students with hearing impairments	Captioning and recognition improved classroom communication
33	Cheng et al. (2022)	Smart Learning Environments in Special Education	Intelligent environments	Multiple disabilities	Adaptive environments promoted feedback and engagement
34	Zhou et al. (2023)	AI-Driven Assessment Tools	ML-based diagnostics	Dyslexia; ADHD	Improved reliability and early diagnosis using ML diagnostics
35	Mendez et al. (2024)	AI-Enabled Inclusive Pedagogies	Adaptive systems; analytics	General SEN population	Demonstrated improvements in equity and accessibility outcomes

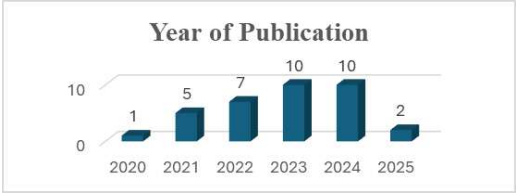
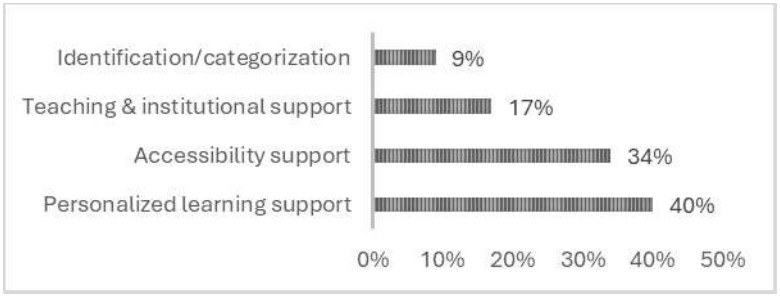


Figure 1. Distributions of the identified studies and the included studies by year

Overview of Included Studies

After applying the inclusion and exclusion criteria, a total of 35 studies published between 2020 and 2025 were included in this review (Table 1). Although the initial search identified more than 200 records, most were excluded because they were non-peer-reviewed, did not focus on AI in special education, or lacked sufficient methodological detail. A notable trend is the sharp increase in publications after 2021, with the highest number appearing between 2023–2024, indicating growing academic and practical interest in the integration of AI in inclusive and special education contexts (Figure 1). Despite this growth, relatively few studies provide robust methodological designs, highlighting the still-emerging nature of the field.

Figure 2. Distribution by focus on disability



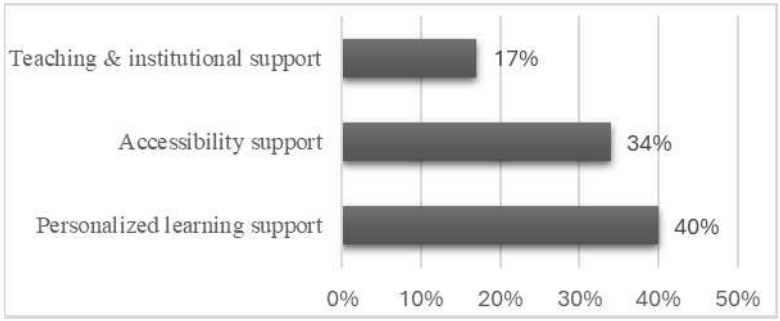


Figure 3. Distribution of AI utilisation in inclusive education

Together, the findings from Table 1 and Figures 2 and 3 highlight how recent studies have applied AI across diverse disability categories and educational functions. To further synthesize these insights, a thematic analysis was conducted to identify cross-cutting patterns in AI applications, pedagogical contributions, and implementation challenges.

Thematic Findings

Thematic analysis using Braun and Clarke's (2006) six-phase framework produced four major cross-cutting themes. These themes capture the core applications, technological features, pedagogical value, and implementation concerns reported across the 35 studies.

Theme 1: AI for Personalised and Adaptive Learning

Many studies highlighted AI systems that adapt pacing, difficulty, and learning pathways based on individual learner profiles. Adaptive learning platforms, intelligent tutoring

systems, predictive analytics, and ML-driven recommendation engines were commonly used to support students with ASD, ADHD, dyslexia, and learning disabilities. These systems improved engagement, task persistence, and learning accuracy by providing real-time adjustments and feedback.

Theme 2: AI for Communication and Accessibility
A significant portion of studies focused on natural language processing (NLP), speech-to-text and text-to-speech systems, communication aids, and computer-vision tools. These interventions primarily supported learners with speech impairments, visual impairments, dyslexia, and hearing difficulties. The studies consistently reported improved classroom participation, increased autonomy, and enhanced access to instructional content.

Theme 3: AI for Skill, Behaviour, & Socio-Emotional Support
Several studies used AI to facilitate behavioural monitoring, socio-emotional interventions, and skill development. Tools included emotion-recognition systems, VR/AR simulations for practicing social skills, and AI-powered behaviour analysis applications. These technologies were particularly effective for learners with autism spectrum disorder, supporting social communication, emotional regulation, and functional skill acquisition.

Theme 4: Implementation, Professional, and Ethical Considerations
Across studies, common barriers included limited teacher training, infrastructure gaps, cost constraints, data-privacy concerns, and algorithmic bias. Many papers emphasized that AI works best as a complement not a replacement for teachers. Successful implementation required sustained professional development, institutional support, ethical oversight, and culturally/contextually relevant design.

Overall, the thematic analysis shows that AI in special and inclusive education is chiefly mobilized to support personalized instruction, accessibility, and learner engagement. While adaptive and assistive technologies demonstrate promising gains, most studies are small or exploratory and point to persistent challenges notably teacher preparedness, infrastructure constraints, data privacy, and potential algorithmic bias. Sustainable impact will therefore require co-design with stakeholders, capacity building for educators, and clear ethical safeguards.

Conceptual Framework

Adoption of the Framework

This study adopts the conceptual model developed by Pagliara et al. (2024) to guide the interpretation of findings. The model outlines four interconnected dimensions Educational Context, Disability and Special Educational Needs (SEN), AI Technologies, and Inclusion that together explain how Artificial Intelligence operates within inclusive education. It emphasizes that AI acts as a bridge between pedagogy and technology, supporting accessibility, personalization, and equitable participation for diverse learners. Adopting this framework provides a clear structure to connect the thematic findings of this review with broader theoretical perspectives on inclusive education.

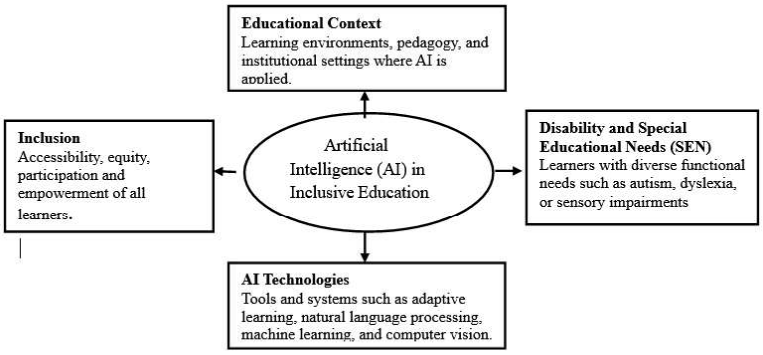


Figure: 4 Conceptual frame work

Integration of Themes within the Conceptual Framework

Following this framework, the integration of Artificial Intelligence within special education can be understood as a multidimensional process shaped by educational, technological, and human factors. The four dimensions Educational Context, Disability and SEN, AI Technologies, and Inclusion operate in dynamic interaction, emphasizing that meaningful implementation requires balance between innovation and pedagogy. This model provides a conceptual bridge between the thematic findings of this review and their broader implications for policy and practice. The subsequent section discusses these findings in relation to existing literature and explores how AI-driven approaches can advance inclusive education.

Discussion

The analysis of 35 studies published between 2020 and 2025 demonstrates that Artificial Intelligence is increasingly positioned as a strategic tool for strengthening inclusive and special education systems. Across the reviewed literature, three consistent priorities emerge: supporting personalised learning, enhancing accessibility, and improving communication and behavioural outcomes for learners with diverse needs. These findings align with broader scholarship mapping the intersection of AI and special education, which similarly argues that AI can significantly expand adaptive opportunities for learners when thoughtfully embedded into pedagogical practice (Seremeti et al., 2024; Ahmed et al., 2025).

A central outcome across the studies is the capacity of AI to personalise learning through adaptive systems, intelligent tutoring, and predictive models. These tools adjust learning pathways, feedback, and content in real time, helping students especially those with ASD, ADHD, dyslexia, and learning disabilities to engage more effectively. This emphasis on individualisation echoes wider arguments that AI can help reshape instructional planning and differentiation in special education, enabling more responsive and student-centred learning (Raza et al., 2024; Ahmad et al., 2025). However, the effectiveness of these systems relies heavily on educator involvement; teachers must interpret AI-generated data and integrate it within curriculum goals, reinforcing that AI enhances but cannot replace professional judgement (Deckker & Sumanasekara, 2025).

Accessibility-focused applications—including speech-to-text, text-to-speech, translation tools, and computer-vision systems—were also widely documented. These tools support

learners with visual, hearing, and linguistic challenges by reducing access barriers and enabling participation consistent with principles of Universal Design for Learning. Studies outside the core dataset similarly highlight that AI-driven assistive tools can expand learning access when contextualised appropriately (Kumari, 2025). Yet the benefits remain uneven across settings. Infrastructure limitations, high costs, insufficient training, and lack of technical support frequently hinder sustained adoption, especially in low-resource environments—an issue repeatedly noted in both global analyses (Luan et al., 2020) and recent AI-in-education reviews (Santos et al., 2024). AI is also emerging as a tool for socio-emotional and behavioural support. Robots, VR environments, and affective computing systems have shown promise in helping students with autism and attention disorders practise social communication, emotional regulation, and executive functioning. These findings are consistent with broader literature emphasising the potential of AI to scaffold therapeutic and behavioural interventions when aligned with learner needs and supervised by skilled professionals (Ahmed et al., 2025). However, the evidence base remains limited by short study durations and small samples, raising concerns about long-term transferability.

Across all thematic areas, the review highlights persistent implementation challenges. These include inadequate teacher training, ethical concerns about data privacy, risks of algorithmic bias, and poor alignment between AI tools and local cultural or educational contexts. Scholars emphasize that without strong governance structures and continuous professional development, AI risks reinforcing rather than reducing inequities (Harkins-Brown et al., 2025; Pagliara et al., 2024). Broader critical analyses echo these concerns, stressing the need for transparent algorithms, stakeholder co-design, and equitable policy frameworks when deploying AI in sensitive educational settings (Raza et al., 2024; Ahmad et al., 2025). The conceptual model adapted from Pagliara et al. (2024) helps explain why these disparities persist. It emphasises that AI outcomes are shaped by the dynamic interaction between educational context, learner characteristics, technological design, and broader inclusion goals. When these dimensions align supported by adequate infrastructure, ethical safeguards, and teacher capacity AI interventions tend to show stronger and more sustainable educational benefits. When they do not, tools often fail to integrate meaningfully into practice.

Collectively, the findings suggest that AI holds genuine promise for transforming special education, but this potential will only be realised through investments in capacity building, ethical governance, culturally responsive design, and long-term research. As recent contributions argue, the future of AI in special education depends not only on technological innovation but also on how well systems embed equity, collaboration, and human expertise at their core (Ahmed et al., 2025; Seremeti et al., 2024).

Limitations of the Review

While this review provides a structured synthesis of recent literature, it is limited by its reliance on secondary data and the uneven methodological quality of the included studies. Several papers lacked detailed research designs, making it difficult to compare outcomes across contexts. The review was also restricted to publications available in English and indexed in major academic databases, which may exclude relevant regional studies.

Despite these limitations, the analysis offers a useful overview of emerging directions in AI-driven special education.

Conclusion

This review synthesised evidence from 35 studies published between 2020 and 2025 to explore how Artificial Intelligence is being integrated into special and inclusive education. Across the literature, AI demonstrates substantial promise in supporting personalised instruction, improving accessibility, and enhancing communication for learners with diverse needs. Adaptive learning systems, speech and language tools, and computer-vision applications consistently show positive effects on engagement, participation, and learning outcomes. However, the findings also make clear that effective use of AI depends on strong pedagogical foundations, teacher preparedness, and ethical governance. Many studies highlight barriers such as limited infrastructure, inadequate professional development, data-privacy risks, and algorithmic bias.

The conceptual model adopted in this review reinforces that AI's educational impact emerges from the interaction between technology, educational environments, learner characteristics, and inclusive values. To fully realise the potential of AI, future work must prioritise longitudinal evaluations, culturally responsive design, and equity-focused policies. Sustained investment in infrastructure, teacher capacity, and stakeholder-driven design will be essential for ensuring that AI tools contribute to not replace human-cantered, inclusive teaching practices. Ultimately, AI holds transformative potential, but its value will depend on thoughtful, ethical, and context-sensitive implementation aimed at improving learning opportunities for all neurodiverse learners.

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South Asian Journal of
Participative Development

Vol.25, No.2 (Spl.), July - Dec. 2025
ISSN No: 0976-2701

Augmenting Human Inquiry: Leveraging Ai, Big Data, and Digital Platforms for Participatory Social Science Research in Viksit Bharat @ 2047

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Abstract

The rapid evolution of Artificial Intelligence (AI), Big Data analytics, and digital platforms is transforming how social science research is conceived, executed, and disseminated. This conceptual and exploratory paper examines the synergistic prospects of participatory research and technology-mediated knowledge creation within the vision of Viksit Bharat 2047. The purpose is to articulate a framework that situates AI-enabled research tools as catalysts for more inclusive, data-rich, and responsive social inquiry. Methodologically, the paper adopts a nonempirical, conceptual synthesis approach by integrating insights from extant literature, emergent digital research paradigms, and public knowledge ecosystems to construct a multidimensional model of "technologically augmented participation." The outcomes emphasize how AI and Big Data empower researchers to decode complex social phenomena, enable participatory knowledge co-creation, and strengthen citizen engagement in the research process. The paper's contribution lies in positioning digital platforms as epistemic bridges between institutional research and community-based knowledge systems, thus reimagining the democratic potential of data-driven inquiry. The implications underscore the need for ethical AI governance, data transparency, and digital literacy to sustain trust and authenticity in technology-enabled participatory research. Limitations concern the conceptual scope and the evolving policy context, which necessitate ongoing empirical validation and adaptive ethical frameworks. By contextualizing AI and Big Data within India's developmental agenda, this work advocates a transformative paradigm for research and development aligned with the inclusive vision of Viksit Bharat 2047.

Keywords: Artificial Intelligence, Big Data, Participatory Research, Digital Platforms, and Knowledge Co-creation

Introduction

The convergence of Artificial Intelligence (AI), Big Data, and digital platforms is reshaping the landscape of social science research, enabling new methodological paradigms that enhance participatory inquiry and knowledge co-creation. Recent advances in AI technologies, especially large language models, have transcended conventional research tools, offering sophisticated capabilities to analyze complex social phenomena and empower inclusive research processes (Xu, 2024). AI's dual role—as an instrument to augment social science investigations and as a subject of social scientific inquiry—offers a fertile ground for conceptual exploration (Xu, 2024). Participatory

research approaches, which emphasize collaborative knowledge production involving diverse stakeholders, have gained renewed urgency in the technological age. The integration of AI necessitates a participatory governance framework to ensure fairness, transparency, and accountability in AI deployment within social research (IIT Madras Study, 2024). Disciplinary advances demonstrate that digital platforms can facilitate dynamic, equitable engagement among researchers and community participants, enhancing co-creation and democratizing knowledge ecosystems (Loisel et al., 2025). These platforms foster dialogic interaction that aligns with deliberation theory, wherein stakeholders re-evaluate policy and research implications in light of emerging evidence (Participatory Turn in AI Design, 2024).

The vision for a Viksit Bharat 2047 requires harnessing these technologies to strengthen research capabilities and generate actionable, context-sensitive insights. Yet, the deployment of AI and digital platforms also raises critical ethical considerations concerning data privacy, inclusiveness, and the digital divide (Xu, 2024; Loisel et al., 2025). Addressing these challenges demands not only technological innovation but also adaptive institutional frameworks that promote participatory knowledge-building while safeguarding social values.

This manuscript builds on this emergent discourse by conceptualizing AI, Big Data, and digital platforms as enablers of participatory social science research in India. It advances a multidimensional framework that integrates technological possibilities with participatory methodologies aimed at fostering inclusive, accountable, and impactful research practices aligned with national development goals.

AI's Dual Role in Social Science Research: Major Theoretical Foundations

This Theoretical Foundations section synthesizes recent conceptual discourse on AI's dual role in social science research, the participatory research framework enhanced by digital platforms, and the ethical governance models critical to equitable technology use. The theoretical foundations of integrating Artificial Intelligence (AI), Big Data, and digital platforms within social science research rest on a dual conceptual framework encompassing "*AI for social science*" and the "social science of AI" (Xu, 2024). This bifurcation highlights AI not only as an advanced methodological tool enhancing hypothesis generation, data analysis, and literature review but also as a subject of social scientific inquiry examining AI agents as social entities exhibiting human-like cognitive and linguistic behaviors (Xu, 2024; Bryman & Hoover, 2016). The intersection creates a rich terrain where technological capabilities and social theories coalesce, inviting reconsideration of foundational social science principles through digital and computational lenses.

Central to this framework is the recognition of AI's transformative potential to augment participatory research, a paradigm that democratizes knowledge production by involving multiple stakeholders, including communities traditionally marginalized in research (Participatory Turn in AI Design, 2024). The participatory turn draws from theories of deliberation and co-creation, emphasizing dialogic knowledge exchange mediated by digital platforms that bridge institutional research with community perspectives (Loisel et

al., 2025). These platforms serve as spaces for collective intelligence, enhancing transparency and reflexivity in research processes.

Moreover, the theoretical underpinnings extend to ethical and reflexive governance frameworks necessitated by AI's socio-technical complexity (IIT Madras Study, 2024). Theories of digital equity, transparency, and accountability inform the governance of AI in social research to mitigate risks of bias, surveillance, and exclusion, aligning technological innovation with societal values. Thus, this conceptual foundation provides a multidimensional approach to understanding AI-enabled participatory social science, informing both innovative research methodologies and critical ethical considerations foundational to building a responsible, Viksit Bharat 2047.

Deployment of AI and Digital Platforms in Socially Inclusive Research: Key Contextual Underpinnings

This Contextual Underpinnings section establishes India's socio-technical environment as a foundational landscape for deploying AI and digital platforms in socially inclusive research aligned with national development priorities. It sets the stage for exploring the conceptual framework and methodological considerations in subsequent sections. India stands at a critical juncture where its socio-economic and technological landscapes intertwine to shape the future of social science research. The contextual backdrop for this exploration is India's ongoing digital transformation, characterized by rapid expansion in digital infrastructure and rising penetration of internet-based platforms, yet marked by a persistent digital divide rooted in socio-economic disparities across rural and urban domains (Laskar, 2023). Social science research in India faces unique challenges and opportunities in leveraging digital platforms for participatory research, knowledge dissemination, and citizen engagement within this complex milieu.

Digital platforms hold transformative promise as institutional actors that can bridge traditional divides by facilitating access to research, enabling wider data sharing, and supporting collaborative knowledge creation. However, adoption rates among Indian researchers and institutions manifest considerable variability, with social media engagement and open science practices trailing behind global averages (Singh, 2024). The Indian policy landscape is increasingly responsive to these dynamics, emphasizing Scientific Social Responsibility and promoting the use of digital tools to strengthen science-to-society connect, which is crucial for inclusive and contextually grounded research aligned with the vision of Viksit Bharat 2047 (ICSSR, 2024).

Moreover, responsible innovation frameworks are gaining traction, highlighting the need for reflexivity, inclusion, and responsiveness in designing digital platforms that serve marginalized communities and address grand societal challenges (Ahuja et al., 2023). The Indian social context, characterized by deep-rooted social structures such as caste and tribe, necessitates culturally sensitive technological implementations to ensure equity and empowerment rather than exclusion or digital marginalization (IJSSSR, 2024). Hence, the contextual underpinnings frame this paper's focus on harnessing AI, Big Data, and digital technologies for participatory social science research that is technologically enabled, ethically robust, and socially inclusive.

Dynamic Interface of AI, Digital Platforms, and Participatory Social Science Research: Important Conceptual Constructs

This Section elaborates the core conceptual constructs critical for understanding the dynamic interface of AI, digital platforms, and participatory social science research in India, directly supporting the manuscript's thematic focus. This manuscript's thematic inquiry into AI, Big Data, and digital platforms in social science research relates closely to several key conceptual constructs that frame the interdisciplinary discourse at the intersection of technology and social inquiry.

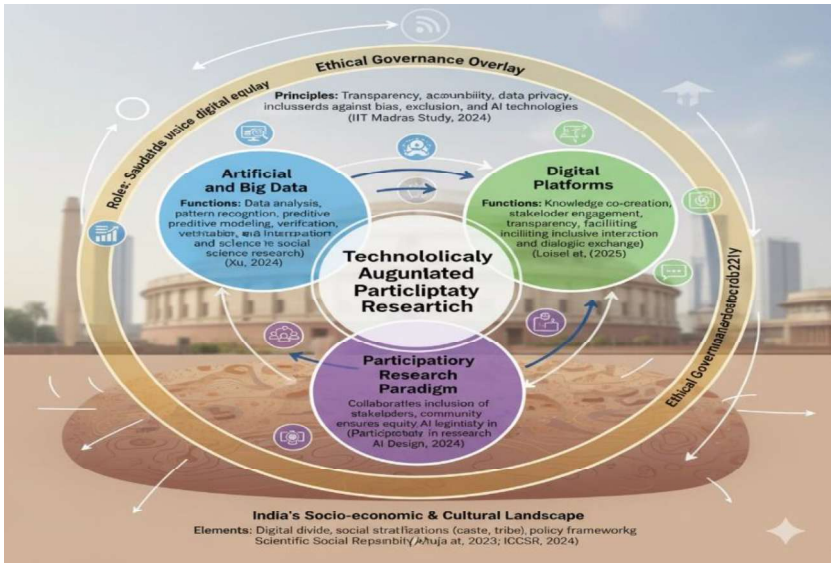
First, the *construct of AI as an Augmentation Tool* underscores AI's instrumental role in enhancing social science methodologies—ranging from hypothesis formation to data mining, pattern recognition, and predictive analytics (Xu, 2024). This augmentation construct is complemented by the Social Science of AI which treats AI not simply as a tool but as a social actor meriting empirical and theoretical scrutiny, thereby broadening the epistemological scope of social sciences (Bryman & Hoover, 2016; Xu, 2024). The concept of Participatory Research is foundational here, reflecting egalitarian knowledge production through collaborative engagement of diverse stakeholders, including traditionally marginalized groups, facilitated by digital platforms that enable interactive and dialogic knowledge co-creation (Participatory Turn in AI Design, 2024). Underpinning this is the construct of *Digital Platforms as Epistemic Spaces,* which conceptualizes platforms not just as technical infrastructures but as spaces that mediate and shape collective intelligence, transparency, and trust in research outcomes (Loisel et al., 2025).

Likewise, *Ethical AI Governance* emerges as a critical construct, emphasizing principles of equity, accountability, and reflexivity to manage the socio-technical complexities and risks associated with AI applications in social research (IIT Madras Study, 2024). This construct integrates notions of digital inclusiveness and stands as a safeguard against algorithmic bias, surveillance, and exclusion within socially diverse contexts. Together, these conceptual constructs provide a multidimensional scaffold that informs the paper's conceptual framework, supporting a nuanced understanding of AI and digital platforms as catalysts for transformative, participatory, and responsible social science research aligned with India's developmental vision.

Advancing Participatory Social Science Research through AI and Digital Platforms: Socially Conscious Conceptual Model

The narrative provided in this Section elucidates the dynamics and interrelationships within the proposed Conceptual Model, positioning it as a robust, socially conscious framework for advancing participatory social science research through AI and digital platforms in India. Building upon the theoretical foundations, contextual underpinnings, and conceptual constructs delineated earlier, this manuscript proposes a comprehensive conceptual model that integrates Artificial Intelligence (AI), Big Data, and digital platforms within participatory social science research structured around the vision of Viksit Bharat 2047. The model conceptualizes a socio-technical ecosystem where these technologies act as enablers of an inclusive, transparent, and reflexive participatory research paradigm, fostering co-creation of knowledge while addressing ethical, social, and developmental imperatives.

Figure-1: Participatory Social Science Research through AI and Digital Platforms: A Conceptual Model



At the core of the Model, as shown above in Figure-1, lies the construct of *Technologically Augmented Participation*, which envisions AI and Big Data analytics as tools that enhance the researcher's capacity to generate fine-grained, context-sensitive social insights by processing large-scale and complex datasets (Xu, 2024). These technologies enable sophisticated pattern recognition, predictive modelling, and natural language processing, which, when embedded within digital platforms, facilitate interactive engagement with diverse stakeholders, including researchers, policymakers, and community members (Loisel et al., 2025). *Digital platforms* are conceptualized as Epistemic and Governance Arenas, spaces that not only mediate knowledge exchange but also incorporate frameworks for ethical AI governance ensuring transparency, accountability, and inclusiveness (IIT Madras Study, 2024). The Framework emphasizes the role of *reflexive practices* where stakeholders critically engage with AI-driven processes and outcomes, thus safeguarding against algorithmic biases and digital exclusion (Participatory Turn in AI Design, 2024). The integrative framework further situates these technological and participatory elements within India's socio-economic and cultural context, addressing structural inequalities such as the digital divide and social stratifications (Ahuja et al., 2023). It calls for adaptive institutional support mechanisms that facilitate capacity-building in digital literacy and data ethics, reinforcing sustained participatory engagement aligned with national development goals. Overall, this Conceptual Model offers a multidimensional lens that charts pathways for harnessing AI and digital technologies to transform social science research into a participatory, equitable, and developmentally relevant endeavour for a Viksit Bharat 2047.

Empirical Review of Evidence-based Research Studies Published in Reputed and Peer-reviewed Journals

This section critically reviews twelve recent research studies relevant to the role of AI, Big Data, and digital platforms in social science research, with a focus on the Indian context. Moreover, this review synthesizes empirical and conceptual evidence

illuminating the promise and complexities of AI and digital platform integration in India's social science research, situating this discourse within broader developmental and participatory frameworks.

The first study, by NITI Aayog (2023), outlines India's national AI strategy emphasizing the deployment of AI for inclusive social growth across critical sectors like healthcare, agriculture, and education. Using a policy analysis methodology, it highlights the potential of AI to bridge socio-economic gaps but acknowledges persistent infrastructural and skills challenges. The study implies that multi-stakeholder collaboration and capacity building are vital for realizing AI's promise sustainably.

Kumar et al. (2024) present an empirical investigation of participatory AI governance models in India, employing mixed methods combining stakeholder interviews and document analysis. The findings underscore the importance of transparency and accountability frameworks designed to engage civil society in AI decision-making, but the authors note the difficulty in institutionalizing participatory mechanisms at scale due to bureaucratic inertia.

Sharma and Banerjee (2025) offer a conceptual exploration of digital platforms as "epistemic spaces" enabling knowledge co-creation in marginalized communities. Their narrative review explores case studies of platform-mediated participatory research, emphasizing the democratizing potential of these technologies while cautioning on digital literacy deficits and platform biases as key limitations.

Mehta et al. (2024) conduct a quantitative analysis on the impact of Big Data analytics on social research efficacy in Indian universities. Utilizing survey data from research faculty, the study reports improved research output quality and collaboration. However, challenges in data availability and ethical concerns about data privacy remain unresolved.

Patel and Singh (2023) explore ethical AI governance in Indian social research settings through a qualitative multi-case study. Their thematic analysis reveals emergent norms emphasizing equity and inclusiveness but points to the lack of comprehensive national guidelines as a critical gap hindering effective ethical oversight.

Chatterjee (2025) reviews participatory AI design methodologies within community health projects in rural India. The paper synthesizes fieldwork observations showing co-creation of AI tools improves acceptance and relevance but highlights infrastructural barriers, including unreliable connectivity and limited local capacity to maintain AI systems.

Rao and Nair (2024) offer a policy critique of AI and digital platform integration in enhancing research dissemination and public engagement. Using content analysis of government and industry reports, they identified a need for stronger digital infrastructure investments and inclusive digital education programs to prevent exacerbating digital divides.

Dasgupta (2023) examines the implications of AI-driven data mining on social science epistemology through a critical theoretical lens. The paper argues that over-reliance on AI risks depoliticizing social phenomena by prioritizing quantifiable data over qualitative insights, urging a balanced methodological approach.

Mukherjee and Roy (2025) investigate AI bias mitigation strategies in automated decision-making used in social welfare programs. Applying experimental design, they demonstrate that pre-processing techniques reduce discriminatory outcomes, but

scalability and contextual adaptation remain challenges requiring further empirical validation.

Joshi (2024) evaluates the role of AI in enhancing participatory societal surveys, employing a mixed-methods approach. The study indicates that AI tools increase respondent engagement and data quality, yet ethical concerns around consent and digital exclusion persist.

Singh et al. (2025) provide a longitudinal study of AI's integration in urban governance research, highlighting how AI-enabled Big Data facilitates real-time decision making. The study uses secondary data analysis embedding socio-political contextual factors but notes risks of algorithmic opacity affecting accountability.

Lastly, Verma and Gupta (2024) review digital platform governance frameworks focusing on inclusivity and reflexivity. Their comparative analysis identifies policy gaps in ensuring equal participation in platform ecosystems, suggesting multi-stakeholder regulatory models as necessary for sustainable, equitable research innovation.

Collectively, these studies present a multifaceted perspective on AI and digital platforms in Indian social science research, delineating numerous opportunities for participatory, ethical, and technologically enhanced inquiry while pointing to infrastructural, ethical, and governance challenges that require ongoing attention.

Inter-disciplinary View of AI's Multifaceted Use: A Literature Review

The following Table-1 consolidates a current, interdisciplinary view of AI's multifaceted use in Indian social science research, featuring insights into deployment contexts, key findings, and inherent challenges, thus informing future directions.

Table-1: Tabulated Summary of Survey of Literature on AI's Use in Social Science Use in India

Author, Year, Context	Summary Findings, Insights, Implications	Limitations
NITI Aayog (2023), India's National AI Strategy focusing on inclusive growth across multiple sectors	The strategy highlights AI's transformative potential to accelerate social development and digital inclusion. It propels cross-sectoral innovations but stresses the need for collaborative governance models.	Digital infrastructure gaps and uneven digital literacy pose risks to equitable AI adoption.
Kumar et al. (2024), Participatory AI governance in India involving mixed methods	Emphasizes transparency and civil society participation as critical to ethical AI governance. Inclusive models build trust and legitimacy in AI deployment.	Difficulty scaling participatory frameworks nationally due to institutional barriers.
Sharma & Banerjee (2025), Digital platforms as epistemic spaces for marginalized groups	Showcases how platforms empower co-creation of knowledge and democratize access. Digital literacy and bias remain central challenges.	Limited reach in low literacy and rural populations; platform biases restrict inclusivity.
Mehta et al. (2024), Big Data analytics impact on research at Indian universities via surveys	Reporting enhancement in research quality and interdisciplinary collaboration, aided by Big Data tools.	Persistent concerns around data privacy and ethical governance.
Patel & Singh (2023), Qualitative multi-case study on ethical AI governance in India	Reveals emergent norms cantered on equity and inclusiveness but exposes national guideline deficiencies.	Lack of nationwide regulatory clarity hinders comprehensive ethical enforcement.
Chatterjee (2025), Participatory AI design in rural health projects	Demonstrates that co-creation with communities improves usability and acceptance of AI systems.	Infrastructure limitations and skills deficiencies obstruct sustained deployment.
Rao & Nair (2024), Policy analysis of AI	Calls for deeper investment in digital infrastructure and education to bridge urban-rural disparities.	Potential exacerbation of digital divides without

integration in governance and public engagement		targeted interventions.
Dasgupta (2023), Critical theoretical review of AI's epistemological impact	Warns about over-reliance on quantitative AI outputs, risking marginalization of qualitative insights and complex social phenomena understanding.	Epistemic narrowness and data-driven bias inherent in current AI models.
Mukherjee & Roy (2025), Experimental study on AI bias mitigation in welfare programs	Shows feasibility of algorithmic corrections reducing discriminatory effects, crucial for equitable social programs.	Scalability and adaptability across diverse contexts remain unresolved.
Joshi (2024), Mixed-methods study on AI-enhanced participatory societal surveys	Confirms increased engagement and data quality, also highlighting ongoing ethical concerns regarding consent and digital exclusion.	Challenges with privacy protections and inclusivity of digitally marginalized groups.
Singh et al. (2025), Longitudinal secondary data analysis of urban governance AI applications	Finds AI enabling real-time data-driven decision-making, improving urban policy responsiveness.	Issues related to algorithmic transparency and accountability.
Verma & Gupta (2024), Comparative analysis of governance frameworks for digital platforms	Identifies governance gaps in inclusivity and recommends multi-stakeholder approaches to foster sustainable and equitable participation.	Regulatory frameworks are nascent and inadequately enforced.

Implications of AI, Big Data, and Digital Platforms and the Inter-connected Roles and Responsibilities of the AI's Eco-system Stakeholders in India

The analysis made in this Section highlights the interconnected roles and responsibilities of the AI ecosystem stakeholders in India, emphasizing collaboration and ethical frameworks as vital for harnessing AI's transformative potential in social science research. The implications of AI, Big Data, and digital platforms on various stakeholders in the social science research ecosystem in India are multifaceted and wide-ranging. For *governments,* the adoption of AI necessitates developing regulatory frameworks and policies that ensure ethical deployment, algorithmic transparency, data privacy, and equitable access to technological benefits, fostering public trust while enabling large-scale social impact initiatives (Pacta, 2019). Governments are also responsible for investing in infrastructure and capacity building, playing a central role in scaling AI-driven interventions across diverse population groups.

For *non-profit organizations (NPOs)* and social sector entities, AI presents a unique opportunity to enhance program efficiency, improve data-driven decision-making, and democratize access to knowledge and services. However, such actors require partnerships with governments and tech providers to access affordable AI tools, data resources, and training, underscoring the importance of multi-stakeholder collaboration (Pacta, 2019). The need for ethical AI governance in these contexts is critical to prevent reinforcing biases or excluding vulnerable populations.

Tech companies and enablers contribute by providing innovative AI models, cloud infrastructure, and pro bono technical support, but must focus on designing contextually relevant, low-bandwidth, and locally adaptable technologies to effectively serve India's diverse social fabric (Pacta, 2019). Philanthropic organizations and social impact investors hold potential to fund research, capacity building, and incubation that supports responsible AI innovation aligned with societal goals. *Academic institutions* and *think tanks* play pivotal roles in researching AI's social implications, developing open-source tools, advocating policy reforms, and educating stakeholders on ethical AI

deployment. Their contributions foster inclusive discourse and build human capital proficient in AI governance and implementation (Pacta, 2019; MeitY & UNESCO, 2025). Continuous stakeholder engagement and participatory approaches are essential to ensure AI aligns with local cultural realities, addresses social inequities, and incorporates community voices throughout the AI lifecycle (Open Loop, 2024).

Collectively, these implications underscore the necessity for an integrated ecosystem approach where accountability, transparency, inclusivity, and ethical governance drive the responsible advancement of AI in social science research, thereby supporting the vision of Viksit Bharat 2047.

AI Adoption in India's Social Science Research Ecosystem: Emerging Pragmatic Strategies from Recent Research and Policy Analysis

This pragmatic strategy section is grounded in key policy documents and evidence-based best practices targeted at inclusive, ethical, and scalable AI adoption in India's social science research ecosystem. For successful implementation of AI, Big Data, and digital platforms in social science research toward the vision of Viksit Bharat 2047, several *pragmatic strategies* emerge from recent research and policy analyses. *First,* establishing a robust regulatory and policy framework is critical; India's national AI strategy exemplifies this by focusing on inclusive growth driven through dedicated legislation, ethical AI governance, and public-private partnerships to ensure transparency, accountability, and data privacy (NITI Aayog, 2023; Royal Society Publishing, 2018). *Second,* investing in digital infrastructure and localized AI capacity building is essential to bridge the urban-rural digital divide. This includes expanding affordable internet access, developing low-bandwidth AI tools suited for diverse linguistic and socio-economic contexts, and enhancing digital literacy programs throughout communities and academic institutions (Pacta, 2019; NITI Aayog, 2023). *Third,* fostering multi-stakeholder collaboration involving government agencies, civil society, academia, tech enablers, and social sector organizations can catalyze socially relevant AI innovations. Government-led platforms supporting AI pilots and scalable interventions, coupled with philanthropic and private sector funding, can enable ethical and context-sensitive AI deployment that includes marginalized populations (Pacta, 2019; Open Loop, 2024). *Fourth,* embedding participatory research approaches and continuous stakeholder engagement throughout AI development and deployment ensures that technology aligns with cultural realities, local needs, and social equity objectives. Reflexivity mechanisms and ethical oversight frameworks should be institutionalized to mitigate bias, discrimination, and exclusion risks (MeitY & UNESCO, 2025; Open Loop, 2024).

Lastly, emphasizing open science, transparent data ecosystems, and interdisciplinary capacity development can accelerate knowledge dissemination and empower researchers and policymakers to harness AI's potential responsibly. Dedicated funding for research, development, and human capital enhancement remain vital to sustaining momentum and institutionalizing AI-driven social science (NITI Aayog, 2023; Pacta, 2019).

Together, these strategies form a coherent roadmap for leveraging AI, Big Data, and digital platforms effectively and ethically to advance participatory social science research in India.

Applications of AI, Big Data, and Digital Platforms in Social Science Research: Gaps, Emerging Trends, and Future Research Pathways

Despite significant advancements in AI, Big Data, and digital platforms applications within social science research, several *critical gaps* persist in the existing literature. One predominant gap lies in the limited empirical investigations into the ethical, societal, and governance dimensions of AI in the Indian context. While policy papers and conceptual frameworks articulate the importance of participatory governance and ethical oversight, few comprehensive empirical studies capture the lived experiences, local community perceptions, and institutional dynamics shaping AI adoption. This gap restricts the development of culturally attuned and context-sensitive governance models. Additionally, the digital divide remains an underexplored area in AI research, particularly how socio-economic, linguistic, and infrastructural disparities affect equitable access to AI-augmented research and digital platforms (Patel & Singh, 2023; Chatterjee, 2025). Theoretical discussions on AI's epistemological impacts also require expansion, as current research tends to privilege quantitative analytics, often at the expense of nuanced qualitative and interpretative insights that social sciences traditionally uphold (Dasgupta, 2023).

Emerging trends indicate a growing recognition of AI's potential to transform participatory research paradigms through enhanced inclusivity and reflexivity. There is increasing interest in the co-creation of AI systems with marginalized communities, facilitated by digital platforms functioning as epistemic spaces where knowledge exchange is democratized (Sharma & Banerjee, 2025). Advances in bias mitigation techniques and ethical AI governance frameworks reflect a maturing research agenda that prioritizes social equity and algorithmic transparency (Mukherjee & Roy, 2025). Moreover, interdisciplinary approaches combining computational methods with critical social theories show promise in addressing epistemic tensions and improving AI literacy among social researchers and communities alike (Kumar et al., 2024). The rapid rollout of national AI strategies and multi-stakeholder consultations has catalysed interest in practical tools, training programs, and adaptive policy mechanisms to support scalable and sustainable AI integration (NITI Aayog, 2023; MeitY & UNESCO, 2025).

Future research pathways must expand empirical investigations through mixed-methods designs that probe the socio-cultural, infrastructural, and political contexts of AI adoption in social science. There is a pressing need for longitudinal studies assessing the impact of AI-enhanced participatory research on social inclusion, policy efficacy, and knowledge democratization. Additionally, research fostering community-led AI development will deepen understandings of co-creation processes and ethical safeguards in diverse settings. Exploring AI's epistemic pluralism by integrating qualitative and quantitative methods can mitigate current biases and enrich social science insights (Dasgupta, 2023).

Further, capacity-building initiatives oriented towards digital literacy, ethical AI governance, and interdisciplinary scholarship are critical to sustaining India's AI ecosystem aligned with responsible innovation principles. Research must also focus on refining policy frameworks that balance innovation encouragement with robust rights protection and digital equity. Such multifaceted inquiry will be pivotal in shaping AI's responsible trajectory in Indian social science research and supporting the national vision of Viksit Bharat 2047.

Summary and Final Thoughts

This final section encapsulates the central insights, contributions, and future imperatives for leveraging AI, Big Data, and digital platforms in the social science research ecosystem in India. This manuscript has presented a comprehensive conceptual and exploratory examination of the transformative role of Artificial Intelligence (AI), Big Data, and digital platforms in social science research within the Indian developmental context of Viksit Bharat 2047. The synthesis reveals that AI offers unprecedented opportunities to enhance participatory research methodologies, democratize knowledge co-creation, and improve policy relevance through technologically augmented participation. The proposed conceptual model articulates the integration of AI and digital platforms as epistemic and governance arenas, emphasizing ethical frameworks, inclusiveness, and reflexivity rooted in India's socio-economic realities. Review of recent literature highlights evolving governance norms, emergent digital ecosystems, and technological innovations that promise more inclusive and accountable research processes. However, persistent gaps in infrastructure, digital literacy, regulatory clarity, and empirical investigation of socio-cultural impacts remain pressing challenges. The strategic implications for stakeholders, including government bodies, non-profit organizations, technology providers, academic institutions, and communities, underscore the importance of collaborative ecosystem approaches fostering transparency, equity, and capacity building. Pragmatic strategies emphasize policy frameworks, infrastructural investments, multi-stakeholder engagement, and participatory governance as critical levers to operationalize AI's promise responsibly. The reviewed literature further points to the necessity of ongoing research focused on mitigating digital divides, advancing ethical AI deployment, and enhancing interdisciplinary scholarship combining qualitative and quantitative insights.

Ultimately, realizing the vision of AI-enabled participatory social science research for Viksit Bharat 2047 demands sustained commitment to inclusive innovation and ethical stewardship. This involves a dynamic interplay of policy innovation, infrastructure development, human capital enhancement, and culturally sensitive governance tailored to India's unique social fabric. Continued empirical research, reflexive learning, and stakeholder engagement will be pivotal in shaping AI's trajectory as a catalyst for equitable, sustainable, and knowledge-intensive development in the decades ahead.

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South Asian Journal of Participative Development
Vol.25, No.2 (Spl.), July - Dec. 2025
ISSN No: 0976-2701

Decoding Implicit Gender Biases in Adolescents' Educational and Social Choices: Implications for Educational Planning in NCR, India

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Abstract

This study tried to explore how gender norms affect adolescents' aspirations and expectations for themselves and their peers of the opposite sex. Research was designed to specifically address the previously documented research gap in quantitatively measuring the implicit gender biases among Indian adolescents. The study's sample consisted of 405 adolescents aged 14-16 years from various socio-economic groups in the National Capital Region. A survey- based vignette tool with two story snippets on higher education aspirations and socialising habits with mixed-gender peers was used. This method was found to be particularly effective for context-specific gender attitudes while keeping social desirability bias low. There was a statistically significant relationship between the sex of the adolescent, the type of school they attended, their parents' education, and monthly household income with the level of awareness about implicit gender biases. Girls and private school students expressed higher awareness levels, while maternal education was found to be the most significant factor influencing adolescents' behavioural choices. Norm analysis revealed that the adolescents were unable to differentiate between personal aspiration and societal expectation, which can be understood as their inability to challenge gender-biased behaviours. The findings underscore the need for policy interventions in educational planning, including integration of gender-sensitive modalities, targeted parental engagement, and gender-transformative curriculum reforms. This study can be used as a methodological template along with the contextual insights for engaging with adolescents for reducing gender biases and creating more equitable educational ecosystems in India.

Keywords: Adolescence, Survey-based Vignettes, Mixed gender socializing, Gender Implicit Bias, Educational Choices, Parental expectations

Introduction

Adolescence, defined by UNICEF as the period between 10 and 19 years, is a critical phase for identity formation and gender role intensification. This process creates a lot of confusion, which is amplified by unclear and hushed social and cultural constraints (John et al., 2017). Adolescents face increasing pressure to conform to culturally sanctioned gender roles. This increased gender stereotyping of beliefs and behaviors can lead to the evolution of a more traditional gender identity in adolescence (Korlat et al., 2021). Our understanding of gender roles gets internalized as we interact with other social institutions that teach us to develop, refine, and learn to 'do' gender. This is done through repetitive reinforcement by agents of socialization (John et al., 2017). The main agents of

socialization include family, school and education systems, peer groups, and social mass media. These agents help adolescents learn their roles in social life (Hoominfar, 2019).
Gender norms and biases impact educational choices and socialization preferences. Though extensive work has been done in India to reach gender parity in education, they still haven't been able to reflect beyond the enrolment rates. The study tries to understand the implicit biases that impact these behavioral choices, as structural barriers have been increasingly worked on.

Perceptions and choices of people can be translated as their expectations for themselves and others. For measurement purposes, an approach based on the work of Bicchieri et al. (2017) is used, which contends that a norm is made up of two types of social expectations: empirical expectations or behaviors considered typical within a group (people's beliefs about "what others do") and normative expectations or behaviors considered appropriate within a group (people's beliefs about "what others think should be done"). These expectations can be seen in various aspects of these norms, which are more objective and, thus, can be used as an instrument for measurement. Gendered social norms are well reinforced within our cultures and communities by creating certain social sanctions. Gender norms are the rules upheld by dictating that there is no dissonance between empirical expectations and normative expectations. Social sanctions are responses or reactions to the behavior of an individual.

All kinds of gender-specific decisions, behaviors, and actions would be applauded by making the person feel more respected within the reference group, while any deviant behavior might lead to punishment or ostracising the individual. Based on Cislaghi & Heise's (2017) learning from "Factors and Norms Influencing Unpaid Care Work: Household Survey Evidence from Five Rural Communities in Colombia, Ethiopia, the Philippines, Uganda, and Zimbabwe," instead of asking respondents about normative expectations directly but indirectly addressing them through simpler questions about the sanctions they perceived would apply to community members, this was found to be more useful.

A critical gap in the existing research has been found the implicit biases that have been developed through the social environments of the adolescents particularly at micro-level remains unmeasured in a quantitative manner.

Rationale for the Study

A research gap in the measurement of norms was realized through the study done by Mackie et al. (2015), which reviewed 173 publications on social norms and showed that only 14% discussed measurement methods. Advancing Learning & Innovation on Gender Norms (ALiGN) shared in their report, 'Quantitative Measurement of Gendered Social Norms,' the worthiness of using survey-based vignettes to examine the presence of social norms. It shared that vignettes are hypothetical scenarios within a specific context that show a character taking a particular action.

They are usually used in qualitative research, though their effectiveness has been noticed in a survey-based quantitative approach where a pre-established set of responses is provided. Horne et al. (2013) investigated the norms surrounding bridewealth, showing

that survey-based vignettes enable researchers to determine the causal influence of different potential factors on norms while mitigating the social desirability bias. They provoke honest answers and don't demand personal revelations as they reflect on a hypothetical character. They are great for exploring context-specific norms as they provide a common frame of reference (Samman, 2019).

This study aims to elucidate adolescents' social aspirations and perceived cultural expectations based on gender, leading to an understanding of their overall perception of gender structures. We distinguish between aspirations, "what individuals hope will happen in the future," and expectations, "what an individual believes will happen in the future" (Gorard et al., 2012). Both begin forming early but are shaped by experiences and the environment (Gutman & Akerman, 2008).

Despite some policy advances, significant gaps persist in rigorous, context-specific quantitative research on implicit gender biases affecting adolescent educational and social choices in India. School-based experimental studies highlight the effectiveness of participatory gender attitude change programs in shifting norms among adolescents but emphasize the need for culturally appropriate, linguistically inclusive instruments and more granular analyses of factors such as school governance and socio-economic diversity (Nag et al., 2025). This study fills this void by quantitatively assessing implicit gender bias with bilingual vignettes to better capture nuances in the NCR context.

This study is essential to truly understanding adolescents' perception of gender norms in the way they experience and then reenact gender social scripts. This will provide a wider view into how gender informs their relationships with parents, siblings, and peers (Sullivan et al., 2018). These learnings can be used to inform our educational policies, school curricula, and the need for career counselling that would facilitate future generations of adolescents in fulfilling their aspirations without the weight of gendered expectations on them.

Methodology

This research has the goal of exploring how gender stereotypes shape adolescents' perceptions and expectations for themselves, as well as aspirations of their peers from the opposite sex, both in educational decision-making contexts as well as social interactions. A quantitative research methodology was developed, as a larger sample size would provide a better representation of the population. It was a descriptive study that described and measured a phenomenon in time.

The universe or target population of the study is all the adolescents aged 14–16 living in the National Capital Region. This age range is critical because it represents a transformative period in adolescence when they are under extensive pressure to meet gender roles and norms (Blum et al. 2019). The sample size was calculated by assuming a confidence level of 95% and a margin of error of 5% while the population parameter could not be established. A total of 405 adolescents belonging to various socio-economic groups were selected. This would help to establish the impact of different variables on their understanding and awareness of the implications of gender biases reflected in their

behaviors. This sample size was sufficiently large to ensure the representativeness of the population while remaining feasible within the study's resources and timeframe.

The primary data collection tool was a survey-based vignette tool, adapted from the Girl Rising Gender Sensitization Program (Vyas et al., 2019) and the Global Early Adolescent Study (Blum et al., 2019). A vignette is a short description, picture, or piece of acting that clearly expresses the characteristics of a thing. It is a tool to assess attitudes, values, norms, and perceptions of particularly sensitive and abstract issues. These may be based on formative research or true stories, which makes them relatable for the participants and ensures comparability (Hughes & Huby, 2012). While these studies used a qualitative version of the tool, our study modified it for quantitative use, aligning with the research design and objectives. These tools were used for a similar demographic, so their findings and recommendations were used for developing two vignette narratives.

Basu et al.'s (2017) paper highlights the findings of the Global Early Adolescent Study, especially for Delhi and Shanghai, sharing that opposite-sex interactions were subject to punitive measures and mobility for girls was restricted in both places. Delhi showed that education and career expectations for boys and girls differed while being more equitable for Shanghai. Based on these themes, two vignettes were developed, one questioning the implicit bias in mobility and career expectations, while the second was based on opposite-sex interactions. A pilot study tool was developed and tested with a small group of adolescents with similar socio-demographics; the learnings from this were used to refine the final version. The final version was then subjected to expert review to ensure more clarity and relevance as well as mitigate the researcher’s bias.

Each vignette presented a short scenario, followed by a series of closed-ended questions. The scenarios were specifically designed based on the usual situations the adolescents in the NCR usually encounter, allowing them to explore gender biases in contextually relevant settings. For each vignette, the first scenario was presented with a female protagonist, followed by the same scenario with a male protagonist. This design made the adolescents reflect on differential biases associated with both sexes in identical situations.

When adolescents were asked the first set of questions about what they thought would be the choice made by the protagonist, they chose the ‘empirical expectations’ or how they believed the world around them would want the situation handled (Samman, 2019). The follow-up question about how they would react gave them a chance to self-reflect and pick an answer that follows the ‘normative expectations,’ which capture their attitude or aspirations. This structure of the dual-question approach was grounded in social norms theory (Samman, 2019), enabling the distinction between perceived societal norms and individual attitudes. This would highlight whether potential discrepancies between the two exist.

This study's adaptation of bilingual vignette tools aligns with recommendations from recent mixed-method evaluations of gender attitude change programs which emphasize linguistic inclusivity to enhance validity and engagement (Syed, 2017). The stratified sampling of adolescents across government and private schools in NCR ensures representative coverage of socio-economic and institutional diversity influencing gender

norm adherence (Nandwani et al., 2022). Reliability tests and pilot data confirm cross-language equivalence and cultural sensitivity, addressing recognized gaps in quantitative gender norms measurement in India (Samman, 2019).

Primary data was collected by administering the tool to adolescents without any clarification or context setting, so there is no knowledge transfer. The National Capital Region is primarily Hindi-speaking, but it was realized during the pilot that few adolescents found it difficult to attempt the tool in Hindi. Thus, the quantitative tool was designed in Hindi as well as English. Before administering the tool, the adolescents were asked about their preference for answering in either language.

Results

The results of the study have been divided into five sections: demographic and socioeconomic variables chosen for the study, story developed based on chosen responses, the effect of each of these variables on the awareness levels of the adolescents, comparative analysis of adolescents' female vs male responses, and the last one being norm analysis of expectations vs aspirations.

Sociodemographic Description of the Sample Chosen for the Study: The demographic variables of the respondents chosen for the study were the sex of the respondents, their age, the type of school they attended, their household arrangements, their parents' education, and their monthly income.

Table 1: Sociodemographic Variables of the Sample

Socio-demographic Variables		Frequency (n)	Percent (%)
Sex	Female	171	42.2
	Male	234	57.8
Age	14 Years	105	25.9
	15 Years	158	39.0
	16 Years	95	23.5
	17 Years	47	11.6
School	Government School	212	52.3
	Private School	193	47.7
Household Structure	Joint Family	112	27.7
	Single Parent	11	2.7
	Both Parents	255	63.0
	Single Child	27	6.7
Mother's Education	Functional Literate	128	31.6
Father's Education	Completed Schooling	105	25.9
	Graduation and above	172	42.5
	Functional Literate	81	20.0
	Completed Schooling	122	30.1
	Graduation and above	202	49.9
Monthly Household Income	Up to Rs. 25,000	161	39.8
	Rs. 25, 000 - 50,000	81	20.0
	More than Rs. 50,000	163	40.2
	Total	405	100.0

Table 1 shows that of the 405 adolescents selected, 171 were females and 234 were males. Each age group had a similar representation, except for 17-year-olds, which was just 11%. About 25% were 14 years old, 40% were 15 years old, and 24% were 16 years old. Of the 7 schools selected, 3 were private and 4 were government-run. 212 adolescents were from government-run schools while 193 were from private schools. Most of the adolescents, i.e. 63%, lived with both of their parents, while about 28% lived in a joint household and 2.7% lived with a single parent. Almost half of the adolescents' mothers were a graduate (42.5%), while surprisingly, 31.6% just knew how to sign their name, and about 26% had at least completed their schooling. While the adolescents' fathers' educational level was higher for both, having completed school, i.e. 30% and almost 50% of the fathers had a graduate degree. But still, 20% just knew how to sign their name. Most adolescents were from households with monthly income below 25,000 INR or more than 50,000 INR, while just 20% belonged to the income bracket of 25,000-50,000 INR.

Story Developed Based on Chosen Responses:

The Tool consisted of two vignettes that had follow-up questions. The relationship of two themes, mobility and voice, with educational choices was explored in the first vignette. For the second vignette, the relationship between two themes, behavioural restrictions and gender attributes, with cross-sex social interactions was studied. A list of the options that got the highest scores was created. The following Table 2 shows adolescents' chosen responses to the follow-up questions:

Table 2: Chosen Responses Table for Survey-based Vignette Tool

Sr. No	Questions	Chosen Response	%
1.	Do you think Kashish is a girl or a boy?	Boy	51.9
2.	Do you think that Kashish should share the desire with their parents?	Yes, there is no harm in asking politely	76.5
3.	What do you think their parents will say/do?	Yes, I think they would agree to it	71.1
4.	What do you think you would have done if you were Kashish?	Politely asked my parents for permission	49.6
5.	What do you think your parents would decide?	Will allow to go	76.3
6.	If instead of Kashish, it was Kanak who would have wanted to go to another city to study then what do you imagine would have been different? What do you think that the parents would have decided?	Will allow Kanak to go	81
7.	What do you think the boys would do when Mehak asks to join in?	They welcome her to join, just like anyone else	47.7
8.	Why do you think they refused to let her join them?	Because they feel uncomfortable discussing boy stuff with girls	55.8
9.	If you were part of the group of male friends and a girl like Mehek asked to join, would you let her join?	You would welcome her to join, just like anyone else	62.7
10.	What do you think the girls would do when Pramod asks to join in?	They welcome him to join, just like anyone else	54.6

11.	Why do you think they let Pramod join them?	Because they think that Pramod is safe and respectful	38.8
12.	If you were part of the group of female friends and a boy like Pramod asked to join, would you let him join?	Yes, I would have let him join like anyone else	67.2

The story that adolescents develop based on their behavioural choices shows that most of them made equitable choices for themselves and peers of the other sex. The following sections explore the relationship between these choices through comparative and norm analyses. The story developed based on the behavioural choices made by the adolescents illustrates a different picture from the literature so far.

Effect of Variables on the Awareness Levels:

To understand the relationship between these variables, the mean total score was calculated for closed-ended responses to each question and compared for all the variables. The total mean score was calculated for each participant, and higher scores indicated their better ability to articulate the effect of gender socialisation. Table 2 elaborates on the level of significance for each of these variables.

Table 3: Descriptive, ANOVA and Post-hoc Results for the Sample

Variable	**Groups**	**N**	**Mean Score**	**F-value**	**p-value**	**Significant Differences (Post-hoc)**
Gender	Female	171	35.19	11.523	0.001	Females > Males
	Male	234	33.75			
School Type	Private School	193	35.08	10.967	0.001	Private > Government
	Government School	212	33.69			
Mother's Education	Graduation/ post-graduation	172	35.09	9.387	<0.001	Grad/Post-grad > Sign name
	Class 10th/12th	105	34.74			Class 10th/12th > Sign name
	Knows how to sign name	128	33.05			
Father's Education	Graduation/ post-graduation	202	35.14	8.542	<0.001	Grad/Post-grad > Sign name
	Class 10th/12th	122	33.98			
	Knows how to sign name	81	32.96			
Monthly Household Income	> Rs. 50,000	163	35.10	6.157	0.002	> Rs. 50,000 > Up to Rs. 25,000
	Rs. 25,000 - 50,000	81	34.60			
	Up to Rs. 25,000	161	33.48			

Effect of Sex of the Adolescent: The mean score for females was higher than males, meaning they articulated the impact of gender socialization on the protagonist's choices and behaviours better. A one-way ANOVA was performed to compare the effect of sex on the mean score of the tool, which was found to be statistically significant (p=0.001). Post-hoc could not be performed because there were fewer than three groups.

Effect of Type of School on Total Mean Score:
The total mean score was further compared based on the type of school they attended. Adolescents from private schools scored 35.08 while Government school students scored 33.69, which indicated their better ability to resist gender- biased behaviors and choices. A one-way ANOVA was performed to compare the effect of the type of school on the mean score of the tool, which was found to be statistically significant (p= 0.001). Post-hoc could not be performed because there were fewer than three groups.

Effect of Mother's Education on Total Mean Score:
A one-way ANOVA was performed to compare the effect of the mother's education on the mean score of the tool, which was found to be statistically significant. Scheffe Test for multiple comparisons found that the total mean score of the tool was significantly different between [Knows to sign name] and [Graduation and post-graduation] (p = [0.001], 95% C.I. = [0.8464, 3.2459]). There was no statistically significant difference between [Knows to sign name] and [Class 10th-12th] (p= [0.009]) and between the group [Graduation and post-graduation] and [Class 10th-12th] (p= [0.796]). This means that mothers' education is a crucial variable in determining adolescents' awareness of gender socialisation processes.

Effect of Father's Education on Total Mean Score:
A one-way ANOVA was performed to compare the effect of the father's education on the mean score of the tool, which was found to be significant. Scheffe Test for multiple comparisons found that the tool mean score of the tool was highly significantly different between [Knows to sign name] and [Graduation and post- graduation] (p = [0.001], 95% C.I. = [0.8262, 3.5350]). There was no statistically significant difference between [Knows to sign name] and [Class 10th-12th] (p= [0.243]) and between the group [Graduation and post-graduation] and [Class 10th-12th] (p= [0.053]). This means that fathers' education also affects the adolescents' awareness levels. Basu et al. (2017) share that mothers' education is the primary factor in determining adolescents' perception of gender biases in dressing, behavior, and overall understanding of gender roles while the second most important aspect is fathers' education.

Effect of Monthly Household Income:
A one-way ANOVA was performed to compare the effect of the Monthly Household Income on the mean score of the tool, which was found to be significant. The tool mean score differed significantly between [Up to Rs. 25,000] and [More than Rs. 50,000] (p = [0.003], 95% C.I. = [0.4691, 2.7707]), according to the Scheffe Test for Multiple Comparisons. Between the groups [More than Rs.. 50,000] and [Rs. 25,000 – Rs.. 50,000] (p= [0.691]) and [Upto Rs. 25,000] and [Rs. 25,000 – Rs.. 50,000] (p= [0.147]), there was no statistically significant difference. This shows that an increase in household income shows a higher level of awareness about gender socialization among adolescents. Bhatia and Bhatia (2020) noted this in their study as well, showing a correlation between socioeconomic conditions of the household and gender equitable behaviours.

Comparative Analysis:
The fourth section is the comparative analysis of adolescents' responses to female vs male situations. This was done by assessing adolescents' perception of parental decision-

making based on the protagonist's sex. The first story snippet walks through the story of Kashish and Kanak, who are twins and are planning to travel to a big city for higher education. This vignette explored adolescents' perceptions of gender differences in mobility and decision-making for higher education. Through the follow-up questions, the relationship between the categorical variables, "Parents would decide for a girl child" and "Parents would decide for a boy child" was examined to look for associations. A chi-squared test with 2 degrees of freedom was performed, resulting in a test statistic of 17.15. This resulted in an asymptotic p-value which is 0.000, therefore, we have strong evidence that the relationship between the variables was statistically significant. This shows that adolescents' perception of parental decision-making about mobility and higher education choices was highly skewed. Concurring with the findings of the GEAS, the response differences by the sex of the respondent and the protagonist were significant among all scenarios (Blum et al., 2019).

The second story snippet is about Mehak and Pramod, who want to socialize with opposite-sex friend groups. This vignette explored adolescents' perceptions of opposite-sex interactions in social settings. They were asked to consider reasons as to why others would have acted in a certain in the given situation and then followed up with what they would have done. Through the follow-up questions, the relationship between the categorical variables, "Boys would do when Mehak asks to join in" and "Girls would do when Pramod asks to join in" was examined to look for associations. A chi-squared test with 1 degree of freedom was performed, resulting in a test statistic of 9.403. This resulted in an asymptotic p-value which is 0.002, therefore, we have strong evidence that the relationship between the variables was statistically significant. This means that adolescents' perception of opposite-sex interaction in a social setting was highly biased.

Norm Analysis:

The final section of the norm analysis of expectations vs aspirations was also calculated by computing a test of associations. This was done by calculating a test of association between adolescents' expectations and aspirations for themselves and peers of the opposite sex. The relationship between the categorical variables, "You would do when Mehak asks to join in" and "You would do when Pramod asks to join in" was examined for association. A chi-squared test with 1 degree of freedom was performed, resulting in a test statistic of 37.674. This results in an asymptotic p-value which is 0.000, therefore we have strong evidence that the relationship between the variables was statistically significant. This means their preference for opposite- sex interactions were aligned with their perceived social expectations.

Lahiri & Jha (2022) also found that in a similar study with adolescents from eastern India, in a discordant manner as well, they reflected gender-neutral attitudes. On this, Mulvey & Killen (2014) shared that when adolescents are asked about the likelihood of resisting peer group gender-stereotypic norms and their expectations from their peers, most of them showed high personal resistance and high expectations from peers to resist. However, the fear of exclusion from the group because of challenging those gender norms overpowered, explaining the asymmetrical status of expectations Consistent with other large-scale studies, this research finds that female adolescents and those attending private schools demonstrate higher awareness of gender biases (Yan & Chen, 2024). However, social

desirability bias remains a challenge in gender norm research, necessitating cautious interpretation of self-reported attitudes; vignette-based approaches mitigate but do not entirely eliminate this (Syed, 2017).

Discussions

From the above results, we can draw the following understanding of the influence of gender socialisation agents on the aspirations and expectations of adolescents for themselves and their peers of the opposite sex.

Socio-demographic variables that have a substantial impact on the gender socialisation process of adolescents. These findings are in sync with the previous literature that adolescent girls tend to have higher levels of awareness regarding gender inequalities as compared to boys (Leaper & Brown, 2008). This can be attributed to the fact that they have drawn this awareness from their lived experiences.

It was realized that the type of school attended was the second most impactful variable in determining their awareness regarding the gender socialization process. As Sahni et al. (2018) denotes in their work, the difference in the type of school the adolescents attend translates into a difference in resource allotment and curricula development (overt and hidden). This can be understood from a simpler perspective that students from private schools have access to better resources that eliminate the most important structural barrier. This was proven statistically through tests of associations as well. Post hoc analysis indicates that having a household income of more than Rs. 50,000/- significantly impacted adolescents' choices for higher education and socializing with mixed-gender groups.

The aspirations and expectations of adolescents are being understood in the form of social sanctions, primarily their perception of parental decision-making and perception of peer influence on socializing with the opposite sex classmates in social settings. Findings show that adolescents' perception of their parental decision-making reflected gender bias. Parents' gendered perceptions about adolescents' abilities, vulnerabilities, and related mobility create a clear separation of responsibilities and behaviors which widens the power imbalances creating lifelong social and health consequences for adolescents (Mmari et al., 2017).

The results of opposite-sex interactions showed that their perception of peer influence on social conduct was able to influence their personal choices as well. However, Shaw et al.'s (2014) study shows that adolescents view opposite-sex interactions as acceptable and harmless till they are in a personal situation, while they seem to have moral concerns when in a social setting.

This can be understood by research that shows when adolescents are socialised to grow up in gender-segregated social worlds, they don't learn anything from each other, which might also be projected in a lack of understanding as well as gender-stereotyped behaviours in male- female relationships (Friedman, 2001). This adult-motivated, especially parents, gender segregation becomes problematic because when faced with

gender-integrated settings, they find it hard to interact and effectively relate with others (Martin et al., 2012).

It can be established from the data that there is a huge gap between what adolescents aspire to and expect from themselves as compared to their opposite-sex peers. It was reflected in the choices they made for higher education as well as their socialisation habits. Literature has repeatedly suggested that gender segregation reinforces gender-typed behaviours (Fabes et al., 2013) while having no improvements in their learning and achievements (Bigler & Signorella, 2011). If efforts are directed toward helping them socialize without restrictions, creating a positive experience for them, it would enhance their understanding, appreciation, and respect for one another (L. Hanish & Fabes, 2014).

Conclusion

In conclusion, we can understand that girls display more awareness regarding gender socialization behaviours. Meanwhile, private school adolescents (boys and girls) performed better on awareness tests than their public-school counterparts. The most important factor affecting adolescents' awareness levels is their mother's education, closely followed by the monthly household income. Comparative analysis revealed that adolescents were able to perceive gender bias in their parental decision-making for their opposite-sex interactions and higher education. Norm analysis showed that the adolescents were unable to challenge these gender-biased behaviours as they were unable to differentiate between expectations and aspirations.

A possible limitation of the study is that it used just a quantitative measure for exploring such a nuanced and abstract concept; it needs to be followed up with a more extensive qualitative research method for a more in-depth understanding. Also, a longitudinal study would provide insights into how this adolescent learning translates into future choices.

A recommendation based on the study would be that having conservation is not enough, it needs to be modelled in the day-to-day workings. Sex-segregated behavior violates adolescents' ability to achieve their full potential as well as takes away from the freedom to explore their identity. Literature suggests that it is the parents, schools, and policymakers' onus to structure adolescents' environments that maximise peer interactions. Mixed-gender groups provide them a safe space to explore their similarities and differences across genders as well as develop skills required for healthy and effective interactions (L. Hanish & Fabes, 2014). Education and academic attainment are some of the biggest predictive markers of life changes, so policymakers must identify subgroups that have limiting beliefs (Rampino et al., 2013). School has a lot of potential to be a gender-transformative institution by changing these gendered narratives as well as shaping more empathetic and open-minded individuals. Teachers can be positive role models for enabling more gender-inclusive behaviours as well as creating classrooms as inclusive spaces (Lindsey, 2015).

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South Asian Journal of
Participative Development

Vol.25, No.2 (Spl.), July - Dec. 2025
ISSN No: 0976-2701

Integrated Child Development Services and Bihar's Demographic Dividend

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Abstract

The Integrated Child Development Services (ICDS) scheme is India's flagship program for early childhood health, nutrition, and education, providing six key services (supplementary nutrition, preschool education, nutrition/health education, immunization, health check-ups, and referral) to children (0–6 years), pregnant women, and lactating mothers. This paper examines ICDS in the context of Bihar's demographic profile. Bihar has one of India's highest fertility rates (TFR ~3.0) prsindia.org and a very young population (children comprise ~46% of its total) as per UNICEF report. It posing both challenges and opportunities for development. Bihar also suffers high child malnutrition (43% stunting, 23% wasting) and maternal illiteracy. This paper review ICDS's objectives, scope, and implementation, and analyse demographic trends in Bihar using NFHS-5 and government data. It compares Bihar's outcomes to Kerala's, a state with far better child health metrics (Kerala's under-5 stunting ~23% TFR 1.8). The analysis finds that Bihar's ICDS reaches millions of children (≈8.0 million) and women (≈1.8 million) through ~112,000 Anganwadi centres, but implementation gaps (low centre attendance, staff absenteeism) limit its impact. We discuss how Bihar can learn from Kerala's experience—through stronger health/education systems, community engagement, and monitoring—to harness its demographic dividend

Keywords: Nutrition, health, family, women, children, government schemes

Introduction

India's Integrated Child Development Services (ICDS) program, launched in 1975, is a comprehensive scheme to support early childhood development. ICDS aims to *"improve the nutritional and health status of children (0–6 years)"*, facilitate their psychological and social development, reduce child mortality and malnutrition, and empower mothers through education. It delivers six core services via Anganwadi Centres: supplementary nutrition, preschool education, nutrition/health education, immunization, health check-ups, and referral services. As of 2021, ICDS operated across all Indian districts, serving tens of millions of children and mothers. The scheme is critical in states like Bihar, which faces acute human development challenges. Bihar, India's third most populous state, is characterized by a *very young population* and *high fertility*. Nearly half of Bihar's residents are children (aged 0–18) reflecting the state's high birth rate (total fertility rate ~3.0 in NFHS. Bihar also lags in literacy, health infrastructure, and sanitation. These

factors result in poor child health: NFHS-5 reports ~43% of Bihar's under-5 children are stunted and 23% wasted far higher than the national average. By contrast, Kerala—a state noted for near-universal education and health access—has a much older population, low fertility (TFR 1.8), and only ~23% child stunting.

This paper explores the intersection of Bihar's demographics and ICDS implementation. We analyze (1) ICDS objectives, scope, and components; (2) Bihar's demographic trends (fertility, age-structure, malnutrition) using NFHS-5 and other sources; (3) ICDS's impact on child health and education outcomes in Bihar; and (4) a comparative analysis with Kerala to identify lessons for Bihar. Drawing on government reports (Ministry of Women & Child Development, NFHS-5, NITI Aayog), UNICEF, and academic studies, we assess how strengthening ICDS can help Bihar leverage its demographic dividend.

Literature Review

ICDS Objectives, Scope, and Components

The ICDS program was designed as an *intersectoral* initiative to address child undernutrition and poor development outcomes. According to the Ministry of Women and Child Development, ICDS's chief objectives are: "to improve the nutritional and health status of children 0–6 years; to lay the foundation for proper psychological, physical and social development; to reduce child mortality, morbidity, malnutrition and school dropouts; to coordinate policy across departments; and to enhance mothers' ability to care for their children through education". Under the *Anganwadi Services* umbrella (the current name of ICDS), each Anganwadi Centre provides a package of six services:

- Supplementary Nutrition: Daily meals or take-home rations to malnourished/normal children (6 months–6 years) and pregnant/lactating women.
- Pre-School Education: Non-formal early childhood education, preparing 3–6 year-olds for school.
- Nutrition & Health Education: Counselling mothers on infant feeding, maternal nutrition, and health practices.
- Immunization: Promoting and facilitating childhood vaccination (provided through public health system).
- Health Check-ups: Regular medical check-ups for children and mothers, often by local health workers.
- Referral Services: Identifying serious cases (like severe malnutrition or illness) and referring to clinics/hospitals

These services are delivered by Anganwadi Workers (Sevikas) and helpers at local centres. The scheme is *universal* and centrally sponsored, operating in all states. By June 2021, India had over 1.38 million operational Anganwadi Centres serving 83.4 million beneficiaries (both children and mothers). States and UTs share funding and responsibilities. Recent government initiatives (e.g. revised cost norms, sanitation at centres, digital monitoring with "Poshan Tracker") aim to strengthen ICDS delivery.

Demographic Dividend and Child Development

The concept of a *demographic dividend* refers to the economic growth potential when a population has a large proportion of working-age people. India's population is young: over 40% are under 20 years. Bihar is even more youth-heavy: UNICEF reports that Bihar's 47 million children (0–18) make up 46% of its ~104 million population. This

youth bulge peaked around 2016, when ~22% of Bihar's population was aged 15–24If Bihar's children grow up healthy, educated and employed, the state could greatly accelerate development. However, realizing this dividend requires investments in health, nutrition, and education. Persistently high fertility and child malnutrition can instead perpetuate poverty. As one analysis notes, Bihar's second-largest adolescent population (10–19 years) *"constitutes more than one-fifth (22.5%) of the state's population"* and this cohort's potential "demographic dividend" will only be harnessed if they are equipped with education, skills, and health

Bihar's Demographic and Health Trends

Bihar's demographic situation is distinctive. NFHS-5 (2019–21) data show a Total Fertility Rate (TFR) of **3.0** children per woman, down modestly from 3.4 in NFHS-4 (2015–16) This is well above India's replacement rate of 2.1 and higher than most large states. (For comparison, Kerala's TFR is only 1.8.) Bihar's younger cohorts face high health and nutrition risks. According to NFHS-5 fact sheets and UNICEF:

- ***Child nutrition:*** 43% of Bihar's under-5 children are *stunted* (low height-for-age) and 23% are *wasted* (low weight-for-height). These rates are significantly above WHO "public health concern" thresholds (WHO flags >30% stunting as critical). For context, Kerala reports only 23% stunting and 16% wasting. Bihar also has high underweight rates (child under-5 underweight ~42%).
- ***Infant and child mortality:*** Bihar's infant mortality rate (IMR) is ~47 per 1000 live births, among the highest in India. Kerala's IMR is around 4.4 per 1000. Under-five mortality in Bihar remains high, reflecting gaps in healthcare access and nutrition.
- ***Health services:*** Institutional delivery in Bihar has improved (63.8% of births in 2015–16, up from ~20% in 2005), but still lags Kerala's near-universal coverage (~100% institutional births). Immunization coverage has risen in Bihar; NFHS-5 reports 71% of children 12–23 months fully immunized for all basic vaccines. Kerala, however, achieves >97% partial coverage.
- **Women's status:** Literacy among Bihar women is low (~55% with basic literacy). Early marriage and adolescent pregnancy are common (one-third of women 20–24 married before 18). Kerala's female literacy is >90%, and only 6% of women marry before 18.

ICDS Impact on Outcomes in Literature

Several studies have assessed ICDS's impact on child outcomes. A World Bank analysis found no overall significant impact on child nutrition at the national level, likely due to implementation issues (e.g. coverage and quality). Some small-scale studies suggest better outcomes for children who utilize ICDS services. For example, one multi-state study linked full participation in ICDS (all services) to a 13-percentage-point lower prevalence of child underweightcdedse.org. However, coverage remains incomplete: a recent analysis noted that among severely wasted children, only 73% had received any ICDS benefit in NFHS-5 (up from 58% in NFHS-4). In Bihar specifically, qualitative reports indicate gaps: A 2015 Bihar study found only 17 of 40 intended children attended Anganwadi meals on average, and severe staff absenteeism (25% of centres had no worker present). This severely limits ICDS impact.

Kerala's Child Development Successes

Kerala consistently leads in child health and development indices. Its success stems from nearly universal primary education, robust public health, and gender equity. NFHS-5 reports Kerala's stunting at 23% and wasting at 16%. Kerala's TFR (1.8) is below replacement, reducing population pressure. Nearly all Kerala women deliver in health facilities, and institutional births (~100%) far exceed Bihar's. School attendance is nearly universal: ~94% of children age 15–17 attend school, compared to only 69% in Bihar. Kerala's child immunization is almost universal. Critically, Kerala has developed strong local governance (e.g. women's self-help groups like Kudumbashree supporting Anganwadis) and intersectoral coordination for child welfare. Reports note that Kerala's government prioritizes child nutrition in political agendas and achieves higher investment in social services. These factors contribute to Kerala's far better child outcomes.

Methodology

This paper is a synthesis of secondary data and literature. We collected data on ICDS and demographics from official and credible sources: NFHS-5 state fact sheets (Ministry of Health & Family Welfare), government press releases (Ministry of Women & Child Development, NITI Aayog), UNICEF state profiles, and peer-reviewed/NGO reports. For Bihar's indicators, we used NFHS-5 and UNICEF data to quantify fertility, nutrition, and program coverage. We also examined a detailed evaluation of Bihar's ICDS Supplementary Nutrition Program to understand implementation challenges. For comparative analysis, NFHS-5 data for Kerala were used (via published summaries) to benchmark key outcomes.

Policy documents and evaluation reports (e.g. NITI's ICDS evaluation, PRS NFHS analysis) supplemented this data. All cited statistics are drawn from these sources, ensuring up-to-date and reliable information. No original field survey was conducted; rather, this is a descriptive analysis integrating multiple data sources to evaluate program impact and demographic context.

Findings

ICDS Objectives and Scope in India

ICDS is a national scheme. Its objectives and components (as listed above) are codified in policy. According to the Press Information Bureau (Government of India), ICDS's goals include not only improving nutrition but also coordinating across departments and empowering mothers. The scheme is operational in all districts, with state/UT governments implementing it with central funding. By mid-2021, India had sanctioned 1,399,697 Anganwadi Centres and about 1,389,110 were operational. The central government released funds per state; for example, in 2020–21 Bihar was sanctioned ₹115,848.70 lakhs (approx. $155 million)

Under the scheme's **six services**, the critical ones for child survival are Supplementary Nutrition, Immunization, and Health Check-ups. Supplementary Nutrition delivers meals (hot cooked meals for 3–6 years; take-home rations for 6–36 months infants and pregnant women). Immunization and health checks link ICDS to the wider public health system (especially under the National Health Mission). Nutrition and health education targets mothers, aiming to raise demand for healthy practices. Pre-school education (for 3–6

years) aims to improve early learning, though many studies note it is often under-emphasized compared to nutrition.

Bihar's ICDS Implementation

Bihar's scale of ICDS implementation is large due to its population. As of June 2021, Bihar had 115,009 sanctioned Anganwadis, of which 112,094 were reported operational. This is the third-highest number of AWCs among Indian states (behind Uttar Pradesh and West Bengal). The state's beneficiaries under ICDS were 7,954,137 children (6 months–6 years) and 1,788,449 pregnant/lactating women totalling ~9.74 million individuals. In comparison, Kerala (population ~35 million) had 33,318 sanctioned AWCs (33,115 operational) and about 1.49 million beneficiaries. On a per-capita basis, Bihar's ICDS network is comparable or even denser due to the larger young population.

In Bihar, the Anganwadi centres serve as the main point of contact for early childhood services. However, multiple evaluations have documented serious implementation gaps. A 2015 workshop report on Bihar's Supplementary Nutrition Programme found systemic leakage and inefficiency Key findings included:

- ***Low Centre Attendance:*** Though each AWC had funds to feed 40 children, on average only about 17 children were present during visits. Poor attendance could reflect lack of awareness or inability of some families to come daily.
- ***Worker Absenteeism:*** Only 40% of centres had both the anganwadi worker and helper present at a given time. In 25% of centres, neither worker was present! Such absenteeism directly limits service delivery.
- ***Budget Leakages:*** The study found 71% of funds for hot meals were unspent or leaked, mainly due to closed centres and non-serving of meals. For take-home rations, 36% of funds were missing from recipients.
- ***Nutritional Status:*** Even among the children tracked, malnutrition was rampant: 58% were stunted and 43% underweight, reflecting the poor baseline that ICDS aims to address.

These findings show that although ICDS covers millions, its *effective coverage* is hindered by operational issues. If many children do not attend daily feeding or if centres are closed, the intended benefits (improved nutrition, health check-ups) do not fully reach them. More recent government initiatives (like technology monitoring via the Poshan Tracker) aim to address some issues of accountability, but gaps remain in Bihar's program delivery.

Bihar's Demographic Challenges

Bihar's high fertility and young age structure create a heavy demand for ICDS. NFHS-5 reported a TFR of 3.0 (nationally, most large states are now below 2.1) This results in a high dependency ratio: a large fraction of the population is below working age. Nearly half of Bihar's population are children (ages 0–18) the highest proportion of children of any Indian state. A large young cohort offers a potential *demographic dividend*, but only if they grow up healthy and educated.

However, Bihar's current child health indicators are poor. NFHS-5 shows 43% stunting among under-5s and 23% wasting (For contrast, Kerala's rates are 23% and 16%

respectively.) Bihar's infant mortality (47/1000) is dramatically higher than Kerala's (~4.4/1000) Under-5 mortality is similarly worse. Chronic undernutrition in Bihar can be traced to poverty, food insecurity, and inadequate health/nutrition services. Even basic health interventions like antenatal care and institutional delivery remain underutilized: only 39% of mothers in NFHS-5 reported a doctor-provided antenatal check-up, reflecting limited access.

Education outcomes also lag. NFHS-5 indicates that while ~89% of children age 6–14 attend school, this drops sharply after age 14 (only ~69% of 15–17-year-olds attend) Female literacy is especially low (~55% of women 15–49 is literate in comparison, Kerala attains nearly universal school enrolment (98–100% attendance) at younger ages, and very high female literacy.

Impact of ICDS on Health, Nutrition, Education in Bihar

Given Bihar's needs, ICDS could play a transformative role. The supplementary nutrition component should improve child anthropometry and maternal nutrition. The preschool education could boost school readiness. Immunization and health check-ups at Anganwadis help reduce child mortality and morbidity. However, evidence suggests limited impact so far: large-scale NFHS trends in Bihar remain unimproved or only slowly improving.

For instance, despite ICDS, Bihar's stunting rate is still 43% (down only slightly from 48% in NFHS-4Severe acute malnutrition (wasting) is nearly 9% which is alarmingly high. On the education front, NFHS does not directly measure preschool attainment, but recent surveys indicate only moderate preschool attendance (unlike Kerala's near-universal early-childhood education). The ICDS impact is also confounded by outside factors (e.g. poverty, sanitation).

A positive sign is rising immunization: 71% of Bihar's 12–23-month-olds have been fully vaccinated (a substantial increase from about 11% coverage in 1998ICDS centres often serve as vaccination points, so the program likely contributed to this improvement. Similarly, institutional delivery has increased (from 19.9% in 2005–06 to 63.8% by NFHS-4partly due to health system expansion, although correlation with ICDS is indirect.

In summary, while ICDS services reach a large population in Bihar, outcome improvements have been modest. The gap between intended services and actual delivery (as shown in field studies) suggests that Bihar's ICDS has yet to fully effect changes in child nutrition and education at scale.

Kerala vs. Bihar: A Comparative Analysis

Kerala provides a stark contrast to Bihar. Both states have similar social welfare schemes, but outcomes differ greatly. Key comparisons (NFHS-5 data):

- ***Fertility & Population Age:*** Kerala's TFR is 1.8, well below replacement, whereas Bihar's is 3.0. Kerala's median age is rising (age structure is aging), while Bihar remains among India's youngest (nearly 58% under 25 per older data. This means Kerala does not face the same demographic pressure, but benefits from smaller family sizes and more resource per child.

- ***Child Health:*** Only 23% of Kerala's children are stunted versus 43% in Bihar Wasting is 16% in Kerala, 23% in Bihar. Kerala's under-5 mortality (5.2/1000) is one-tenth that of Bihar. Bihar's IMR (47/1000) remains far higher. Kerala's near-100% immunization contrasts with Bihar's 71%. This indicates Kerala's health and ICDS-related services are more effectively protecting children.
- ***Education & Nutrition Awareness:*** In Kerala, virtually all 6–14-year-olds attend school and >94% of 15–17-year-olds, whereas Bihar has 89% (age 6–14) and only 69% (age 15–17). This difference in education attainment contributes to better maternal knowledge and childcare in Kerala. Kerala also has far higher per-capita incomes and female workforce participation, which improve child welfare.
- **ICDS Implementation:** Kerala reports high Anganwadi utilization (e.g., preschool attendance is nearly universal for age 3–5, and hot meals are served regularly). A 2004 study noted >90% coverage of supplementary feeding in "owned" Anganwadis. In contrast, Bihar's ICDS programs suffer low beneficiary turnout and quality issues. For example, the Bihar study reported only 17 children fed per centre (vs 40 intended) and absenteeism, whereas Kerala's centres generally maintain full staffing.

These comparisons highlight Kerala's systemic strengths: higher investment in social services, better government delivery, community participation, and a stronger public health system. Kerala also benefits from women's education (few teenage pregnancies) and local accountability (strong village councils and women's self-help groups are actively involved in monitoring schools and Anganwadis).

Discussion

Bihar's demographic trend of a growing child population presents both a challenge and an opportunity. If the large cohort of children is nurtured properly, Bihar could enjoy a demographic dividend, achieving faster growth as these children enter the workforce. However, the current situation—high fertility, poor nutrition, and limited education—risks squandering this dividend. ICDS is Bihar's primary vehicle to improve child outcomes, but our review finds that programmatic weaknesses have limited its impact.

Key lessons from Kerala and global evidence suggest that merely having ICDS structures is not enough; quality and outreach matter. For Bihar, this implies:

- **Strengthening Anganwadi Functioning:** The glaring absenteeism and low attendance at Bihar's centres must be addressed. This could involve stricter accountability, community oversight, and incentives for workers. Kerala's model of linking Anganwadi workers to local self-help groups could be emulated; indeed, Bihar's own rural livelihood mission (JEEViKA) is exploring taking over the supplementary nutrition distribution. Involving women's groups in running the kitchens or monitoring food delivery has shown promise.
- **Improving Infrastructure and Resources:** Kerala Anganwadis typically have better facilities (clean buildings, toilets, water). Bihar must ensure functional infrastructure. The 2021 ICDS guidelines call for sanitation and water at centres Bihar should prioritize these, as clean environments encourage attendance.
- **Focus on Education and Behaviour Change:** Kerala invests heavily in women's education and community awareness (e.g., gender equity campaigns).

Bihar needs similar emphasis on female literacy and health education, which will raise maternal empowerment. Nutrition and health education sessions at Anganwadis should be made rigorous. NFHS indicates only about half of Bihar women have basic literacy; bridging this gap is crucial for ICDS's demand-generation.

- **Targeting High-Risk Areas:** Within Bihar, some districts have extremely high malnutrition burdens (e.g. Purba Champaran and Patna together have over a million underweight children Learning from Kerala's district-level data dashboards, Bihar's government could use headcount analyses (as NITI demonstrated) to focus resources on hotspots.
- **Data and Monitoring:** The NFHS and NITI reports highlight lack of granular data in Bihar. Using digital tools like the Poshan Tracker (mentioned in ICDS guidelines can improve real-time monitoring of which children get meals. Kerala's local governments publish performance data; adopting a transparent scorecard (as Kerala's local bodies sometimes do for schools) could help Anganwadis.
- **Holistic Child Development:** Kerala's ICDS success is intertwined with its excellence in other sectors. For Bihar, ICDS cannot act in isolation. Improvements in sanitation, clean water, and primary healthcare (e.g. ASHA worker outreach) will amplify ICDS's effect. For instance, vitamin A supplementation and deworming (often delivered via Anganwadis) can significantly reduce undernutrition when combined with better diets.

In sum, Bihar should not abandon ICDS but reform and reinforce it. This means higher functional coverage (ensuring the centre that exists is actually serving children), integrating ICDS with schools (ensuring that children transition smoothly from preschool to formal education), and empowering the mothers and communities that ICDS is meant to serve.

Kerala's example underscores that the institutional framework (like strong local governance) and political will (child health as a priority) are as important as the scheme itself.

Conclusion

Bihar stands at a critical juncture. Its demographic profile – a large and growing youth population – could be a tremendous asset if it turns into a skilled, healthy workforce. ICDS is Bihar's best tool for achieving this transformation in the early years, but the program's potential is yet unrealized. This paper has shown that while ICDS covers millions of children and mothers in Bihar, gaps in delivery weaken its impact. In contrast, Kerala's consistent prioritization of child development across health, education, and social programs has yielded far better outcomes (low stunting, high literacy, near-zero mortality)

To harness Bihar's demographic dividend, the state must strengthen ICDS implementation. Practical steps include ensuring Anganwadi centres operate fully (eliminate absenteeism), improving the quality of supplementary feeding, and enhancing maternal education. Simultaneously, cross-sector improvements in sanitation and

schooling are needed to multiply ICDS's effect. Government and civil society should draw on Kerala's and global lessons: empower local communities, use data-driven monitoring, and sustain political focus on children's well-being.

In the near term, close monitoring of NFHS-5 and future surveys will reveal whether Bihar's investments in ICDS and related programs pay off in better child health and human capital. If successfully reformed, ICDS in Bihar can convert a demographic challenge into a demographic dividend, driving economic growth and social progress.

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