

EDUCATIONAL INQUIRY AND PRACTICE

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Artificial intelligence and the future role of teachers: Opportunities, challenges, and emerging professional responsibilities

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Abstract

Artificial intelligence (AI) is increasingly influencing educational practice through applications such as personalised learning, automated assessment, learning analytics, and generative AI tools. These developments have generated debate regarding the future role of teachers and the extent to which AI may transform educational work. Drawing on the perspective of human–AI complementarity, this conceptual article examines how AI is reshaping teaching by creating new opportunities, introducing significant challenges, and expanding teachers' professional responsibilities. The discussion highlights the potential of AI to support personalised instruction, timely feedback, data-informed decision-making, and professional learning. At the same time, concerns about academic integrity, algorithmic bias, data privacy, and digital inequality continue to pose significant educational and ethical challenges. The article argues that AI is unlikely to replace teachers because effective teaching depends on human capacities such as pedagogical judgment, ethical reasoning, creativity, and socio-emotional support. Consequently, teachers are increasingly expected to facilitate learning, critically evaluate AI-generated information, provide ethical guidance, and promote AI literacy. The article concludes that the future of education depends on productive collaboration between teachers and AI rather than technological substitution.

Keywords: *Artificial Intelligence, Teacher Roles, Teacher Education, AI Literacy, Human–AI Complementarity*

1. Introduction

Artificial intelligence (AI) has moved from a specialised technological domain to a visible presence within educational settings. Intelligent tutoring systems, learning analytics platforms, automated assessment tools, and generative AI applications such as ChatGPT increasingly support teaching and learning activities across educational levels. Recent developments in generative AI have accelerated scholarly and public debate about the future of teaching, as these systems can generate text, answer questions, provide feedback, and assist learners in ways previously associated with human expertise (Kasneci et al., 2023; UNESCO, 2023).

The growing presence of AI has prompted contrasting interpretations of its educational significance. Some scholars argue that AI can enhance instructional effectiveness through personalised learning pathways, timely feedback, and data-informed decision making (Holmes et al., 2019). Others caution that excessive reliance on AI may raise ethical concerns about bias, privacy, transparency, and academic integrity (Selwyn, 2019; UNESCO, 2023). These competing perspectives indicate that discussions about AI in education extend beyond technological capability and increasingly focus on the changing nature of educational work.

At the centre of this debate lies the question of how AI may reshape teachers' roles. Earlier technological innovations often promised to transform teaching, yet evidence suggests that technology rarely replaces educators because teaching involves complex pedagogical, social, and ethical responsibilities that extend beyond information delivery (Luckin, 2018). While AI may automate selected routine tasks, teachers continue to interpret learning needs, cultivate meaningful relationships, support student well-being, and exercise professional judgment in unpredictable educational contexts.

This article examines how AI influences the future role of teachers by analysing emerging opportunities, persistent challenges, and evolving professional responsibilities. The discussion argues that AI does not diminish the importance of teachers. Instead, AI may increase the value of distinctly human capabilities such as critical judgment, ethical reasoning, creativity, and socio-emotional support. Understanding this transformation remains important because teacher education institutions and policymakers must prepare educators for a rapidly changing technological landscape.

Unlike many discussions that focus primarily on the capabilities or limitations of AI technologies, this article examines the future role of teachers through the lens of human–AI complementarity and identifies emerging professional responsibilities that may define teaching in AI-supported educational environments.

2. Conceptual Framework: Human–AI Complementarity in Education

Understanding the future role of teachers requires a conceptual perspective that moves beyond the simplistic question of whether artificial intelligence will replace human educators. Much of the public discourse surrounding AI in education tends to frame the relationship between technology and teachers as a competition in which advances in automation gradually reduce the need for human involvement. However, contemporary educational scholarship increasingly challenges this assumption and instead proposes a complementary relationship between human expertise and artificial intelligence (Holmes et al., 2019; Luckin, 2018). From this perspective, the educational significance of AI lies not in replacing teachers but in reshaping how human and technological capabilities interact to support learning.

The principle of human–AI complementarity rests on the recognition that humans and intelligent systems possess different strengths. AI systems can process large volumes of data, identify patterns, generate rapid feedback, and perform repetitive tasks with considerable efficiency. These capabilities enable AI to support activities such as adaptive learning, automated assessment, and learning analytics (Zawacki-Richter et al., 2019). Nevertheless, educational practice extends beyond information processing and task automation. Teaching requires contextual understanding, ethical judgment, interpersonal communication, creativity, and sensitivity to learners' emotional and social needs. Current AI systems demonstrate limited capacity to perform these functions in ways that reflect the complexity of authentic educational relationships.

Luckin (2018) argues that the most productive educational use of AI involves creating a partnership in which technology augments human capabilities rather than replacing them. Within such a partnership, AI may support teachers by generating insights from learner data, identifying areas of academic difficulty, and automating routine administrative tasks. Teachers, in turn, interpret these insights, adapt them to specific educational contexts, and make decisions that reflect pedagogical goals and learner well-being. This relationship suggests that educational effectiveness depends not on the independent performance of either teachers or AI systems, but on their capacity to collaborate.

The concept of complementarity also helps explain why technological advancement has not historically eliminated the need for teachers. Educational technologies have repeatedly transformed instructional practices, yet teachers have remained central because learning involves social interaction, motivation, identity development, and moral guidance in addition to knowledge acquisition (Selwyn, 2019). AI may alter how teachers perform their work, but it does not remove the need for professional judgment when addressing diverse learner needs and complex classroom situations. Consequently, the emergence of AI may increase demand for those aspects of teaching that rely most heavily on human capabilities.

A complementary framework further highlights the importance of maintaining human oversight in AI-supported educational environments. Although AI systems can provide recommendations and generate educational content, these outputs are not inherently objective or error-free. Teachers, therefore, serve as critical evaluators who assess the appropriateness, accuracy, and ethical implications of AI-generated information. UNESCO (2021) emphasises that human agency and accountability should remain central principles in the development and use of AI. Applying this principle to education suggests that teachers must retain responsibility for decisions that influence learning, assessment, and student welfare.

The human–AI complementarity framework provides a useful lens for understanding the opportunities and challenges discussed throughout this article. Opportunities emerge when AI supports teachers in ways that enhance professional effectiveness, whereas challenges arise when technological capabilities are viewed as substitutes for educational judgment and human relationships. Consequently, the future of teaching may depend less on technological sophistication and more on educators' and institutions' ability to establish productive partnerships between human expertise and artificial intelligence.

Viewed through this framework, the central issue is not whether AI will replace teachers but how educational systems can harness AI while preserving the human qualities that underpin

meaningful learning. This perspective informs the subsequent discussion of opportunities, challenges, and evolving professional responsibilities in the AI era.

3. Artificial Intelligence and the Transformation of Educational Practice

Artificial intelligence has begun to alter educational practice by expanding the capacity of digital systems to support learning, assessment, and instructional decision-making. Unlike earlier educational technologies that primarily delivered content, contemporary AI systems can analyse learner data, adapt instructional pathways, generate feedback, and respond to user inputs in real time (Holmes et al., 2019). These capabilities have positioned AI as a significant component of ongoing efforts to personalise learning and improve educational efficiency across diverse contexts.

One prominent contribution of AI lies in its ability to support personalised learning. Traditional classroom instruction often requires teachers to address the needs of students with varying abilities, interests, and learning speeds within limited instructional time. AI-powered systems can assist this process by analysing patterns in learner performance and recommending activities that align with individual learning needs. Research on intelligent tutoring systems suggests that adaptive technologies can provide targeted support and immediate feedback, which may enhance learner engagement and achievement when integrated appropriately into teaching practices (Ma et al., 2014; Zawacki-Richter et al., 2019). Consequently, AI has strengthened the possibility of tailoring instruction to individual learners at a scale that would be difficult to achieve through human effort alone.

In addition to personalising learning, AI increasingly influences educational assessment. Automated scoring systems, learning analytics platforms, and generative AI applications can evaluate student responses, identify learning gaps, and generate feedback quickly. Such capabilities may reduce administrative burdens that often consume substantial portions of teachers' time (Luckin, 2018). Nevertheless, educational assessment involves more than efficiency. Teachers frequently interpret contextual factors, assess higher-order thinking, and exercise professional judgment when evaluating student work. Therefore, AI may support assessment processes, but current evidence does not suggest that it can fully replicate the nuanced evaluative practices that characterise effective teaching.

Recent advances in generative AI have further accelerated discussions about educational transformation. Tools such as ChatGPT can generate explanations, summarise information, answer questions, and assist with content creation. These capabilities have expanded access to educational support while simultaneously raising concerns regarding accuracy, bias, and academic integrity (Kasneci et al., 2023; UNESCO, 2023). The educational significance of generative AI, therefore, extends beyond technical functionality. Its widespread adoption challenges conventional assumptions about knowledge production, assessment design, and learner autonomy, prompting educators to reconsider established pedagogical practices.

Despite these developments, the impact of AI on education remains shaped by human decisions rather than solely by technological capability. Selwyn (2019) argues that educational technologies often reflect broader social, political, and institutional priorities rather than functioning as neutral tools. From this perspective, the transformative potential of AI depends on how educators, institutions, and policymakers choose to integrate these systems into

teaching and learning processes. As a result, understanding AI requires attention not only to technological innovation but also to the educational values that guide its implementation.

Taken together, current developments indicate that AI is transforming several dimensions of educational practice, including personalised learning, assessment, and instructional support. However, these transformations do not eliminate the need for teachers. Instead, they create new conditions under which teachers must exercise professional judgment and pedagogical expertise. This evolving relationship between AI and educational practice provides the foundation for examining the opportunities that AI may create for teachers.

4. Opportunities Created by Artificial Intelligence for Teachers

Artificial intelligence may create significant opportunities for teachers by enhancing instructional effectiveness, reducing routine administrative tasks, and supporting more informed educational decision-making. Although public discussions often focus on the possibility of technological replacement, much of the current literature suggests that AI functions more effectively as a tool that augments rather than substitutes teacher expertise (Holmes et al., 2019; Luckin, 2018). This perspective shifts attention from concerns about displacement to questions regarding how teachers can use AI to strengthen educational practice.

One important opportunity lies in AI's potential to support personalised instruction. Teachers frequently encounter classrooms characterised by diverse learning needs, abilities, and interests. Meeting these varied needs through conventional instructional approaches can prove challenging, particularly in large classes. AI-enabled systems can analyse learner performance data and provide recommendations that help teachers tailor instruction to individual students (Zawacki-Richter et al., 2019). Such insights may allow educators to identify struggling learners, recognise emerging learning patterns, and adjust instructional strategies more effectively. Consequently, AI may strengthen teachers' capacity to address learner diversity without diminishing their central role in the educational process.

Another notable opportunity concerns the provision of timely feedback. Feedback plays a crucial role in promoting student learning, yet teachers often face substantial constraints on the time available for detailed evaluation. AI-based assessment tools can assist by generating preliminary feedback, identifying common errors, and monitoring learner progress across multiple tasks (Luckin, 2018). While teachers retain responsibility for interpreting student performance and providing meaningful pedagogical guidance, AI may reduce the workload associated with routine assessment activities. This support can enable teachers to devote greater attention to instructional planning and learner engagement.

AI also has the potential to enhance data-informed decision-making in educational settings. Educational institutions increasingly collect large volumes of learner data, yet teachers may struggle to turn it into actionable insights. Learning analytics systems can identify patterns related to participation, achievement, and engagement, thereby supporting instructional decisions grounded in empirical evidence (Ifenthaler & Yau, 2020). However, the value of such systems depends on teachers' ability to interpret and apply the information appropriately. Therefore, AI may expand access to educational insights, but professional judgment remains essential for transforming those insights into effective teaching practices.

Beyond classroom instruction, AI may contribute to teachers' professional learning and development. Generative AI tools can assist educators in designing lesson plans, preparing instructional materials, generating examples, and exploring alternative pedagogical approaches. Recent evidence suggests that teachers increasingly use AI applications as professional support tools rather than merely as classroom technologies (Kasneci et al., 2023). Such uses may reduce preparation time and expose educators to new instructional possibilities. Nevertheless, effective utilisation requires critical evaluation because AI-generated content may contain inaccuracies, biases, or pedagogical limitations.

The opportunities associated with AI extend further to fostering innovation in teaching practices. Traditional instructional models often position teachers as primary sources of information. In contrast, AI-supported environments may allow educators to devote greater attention to facilitating inquiry, collaboration, critical thinking, and problem-solving. Holmes et al. (2019) contend that AI can automate selected routine functions, thereby creating opportunities for teachers to focus on higher-order educational goals that require human interaction and professional expertise. From this perspective, AI may encourage a shift from information transmission toward more learner-centred pedagogical approaches.

Taken together, the available evidence suggests that AI offers several opportunities to enhance teachers' professional work. Personalised instruction, timely feedback, data-informed decision-making, professional learning support, and pedagogical innovation represent important areas in which AI may strengthen educational practice. However, these opportunities do not emerge automatically. Their educational value depends on thoughtful implementation and teachers' critical engagement. This consideration becomes particularly important when examining the challenges and risks that accompany the growing integration of AI into educational settings.

5. Challenges and Risks Associated with Artificial Intelligence in Education

Despite its potential benefits, integrating artificial intelligence into education poses several challenges that may complicate teaching practice and raise important ethical concerns. While AI can support instructional activities and administrative processes, its adoption also requires educators to address issues related to academic integrity, algorithmic bias, data privacy, and equitable access. These concerns suggest that the educational value of AI depends not only on technological capability but also on the conditions under which institutions and teachers employ these systems.

A major challenge concerns the growing threat to academic integrity posed by generative AI tools. Applications such as ChatGPT can produce essays, summaries, and responses that resemble human-authored work, making it increasingly difficult to determine the originality of student submissions. Recent studies indicate that generative AI has intensified concerns regarding plagiarism, authorship, and the validity of conventional assessment practices (Kasneci et al., 2023; Tlili et al., 2023). As a result, teachers may need to redesign assessment tasks to emphasise critical analysis, authentic performance, and reflective engagement rather than simple information reproduction. The challenge, therefore, extends beyond detecting misconduct and involves rethinking how educational institutions evaluate learning in an AI-rich environment.

Another significant concern relates to algorithmic bias and the reliability of AI-generated outputs. AI systems learn from existing datasets, which may contain social, cultural, or

historical biases. Consequently, AI applications can reproduce or even amplify the inequities present in the data on which they were trained (UNESCO, 2021). Furthermore, generative AI tools occasionally produce inaccurate or fabricated information while presenting it with apparent confidence. Such limitations may undermine educational quality if learners accept AI-generated content uncritically. Teachers, therefore, assume an increasingly important role in helping students evaluate information, verify sources, and develop critical digital literacy skills. Data privacy and surveillance pose additional challenges as AI use grows in educational settings. Many AI-driven platforms collect extensive data on learner behaviour, performance, and engagement patterns. Although these data can support personalised learning and learning analytics, concerns arise regarding informed consent, data ownership, and the potential misuse of sensitive information (Williamson & Eynon, 2020). Educational institutions must therefore balance the benefits of data-driven insights with the responsibility to protect student privacy. In this context, teachers often serve as intermediaries, helping students navigate the ethical implications of digital technologies while advocating responsible data practices.

The increasing reliance on AI also raises concerns about the potential erosion of human judgment in educational decision-making. AI systems can generate recommendations regarding learning pathways, assessment outcomes, and instructional interventions. However, educational decisions frequently require contextual understanding, professional discretion, and sensitivity to individual learner circumstances. Selwyn (2019) argues that excessive faith in technological solutions may encourage educators and institutions to overlook the social and relational dimensions of teaching. Consequently, teachers must remain cautious consumers of AI-generated recommendations rather than treating algorithmic outputs as objective or infallible sources of guidance.

A further challenge concerns the persistence of digital inequalities across educational contexts. Access to advanced technologies often varies across socioeconomic conditions, institutional resources, and geographical locations. Students and teachers in under-resourced settings may have limited opportunities to benefit from AI-supported learning environments, thereby widening existing educational disparities (UNESCO, 2023). The promise of AI-enhanced education may therefore remain unevenly distributed unless policymakers and institutions address issues of accessibility and digital infrastructure. This challenge highlights the broader social context within which educational technologies operate.

Collectively, these challenges demonstrate that adopting AI in education involves complex pedagogical, ethical, and social considerations. Concerns about academic integrity, bias, privacy, overreliance on technology, and unequal access suggest that AI cannot serve as a straightforward solution to educational problems. Instead, teachers must critically evaluate AI tools while safeguarding educational values and learner interests. These evolving responsibilities point to a fundamental transformation in teachers' professional roles, one that warrants closer examination.

6. Emerging Professional Responsibilities of Teachers in the AI Era

The growing integration of artificial intelligence into educational environments is reshaping teachers' professional responsibilities rather than diminishing their importance. Although AI can perform selected instructional and administrative functions, it cannot fully replicate the complex human capacities that underpin effective teaching. Consequently, the expansion of AI

in education requires teachers to assume new responsibilities while strengthening several existing dimensions of professional practice. These evolving responsibilities highlight a transition from the traditional role of information provider toward a more multifaceted role that combines pedagogical, ethical, and relational expertise.

One emerging responsibility is to facilitate learning rather than serve primarily as a transmitter of knowledge. Historically, teachers have often served as the primary source of information in classrooms. However, learners now access information through diverse digital platforms, including AI-powered systems that generate explanations and respond to questions in real time. In such contexts, the value of teaching increasingly lies in guiding learners to interpret, apply, and critically evaluate information rather than merely acquiring it. Luckin (2018) argues that educators remain essential because meaningful learning requires human support in reasoning, reflection, and knowledge construction. As AI expands access to information, teachers may therefore devote greater attention to cultivating deeper forms of understanding.

A second responsibility concerns the critical evaluation of AI-generated content. Generative AI systems can produce convincing responses, yet they may also generate inaccurate, incomplete, or biased information. Research indicates that large language models can create content that appears credible despite containing factual errors or unsupported claims (Kasneci et al., 2023). Consequently, teachers must help students develop the capacity to question sources, verify information, and recognise the limitations of algorithmic outputs. This responsibility extends beyond traditional information literacy because it requires learners to understand how AI systems generate content and why those outputs may not always be reliable.

Ethical guidance represents another increasingly important dimension of teachers' professional work. The use of AI in education raises questions related to fairness, transparency, accountability, privacy, and academic integrity. UNESCO (2021) emphasises that educational stakeholders should promote the ethical development and use of AI while protecting human rights and social inclusion. Within educational settings, teachers occupy a strategic position because they directly influence students' attitudes and behaviours regarding technology use. As a result, teachers may play a crucial role in helping learners navigate ethical dilemmas associated with AI while fostering responsible and informed digital citizenship.

The AI era also increases the importance of teachers as designers of meaningful learning experiences. While AI systems can generate content and recommend learning activities, they do not possess a comprehensive understanding of classroom dynamics, learner motivation, or contextual educational needs. Effective learning environments require thoughtful alignment among learning objectives, instructional strategies, assessment practices, and student characteristics. According to Holmes et al. (2019), AI functions most effectively when educators integrate technological capabilities within pedagogically sound learning designs. Therefore, rather than reducing professional expertise, AI may heighten the importance of instructional design as a core teaching competency.

In addition, teachers continue to serve as providers of socio-emotional support, a responsibility that remains difficult to automate. Learning involves emotional, motivational, and interpersonal dimensions that extend beyond cognitive performance. Students frequently seek encouragement, empathy, reassurance, and personal guidance from educators, particularly during periods of academic uncertainty or personal difficulty. Although AI systems can

simulate conversational interaction, current technologies lack genuine emotional understanding and the ability to build human relationships. Selwyn (2019), therefore, cautions against the assumption that technological systems can replace the relational aspects of teaching. The enduring importance of socio-emotional support suggests that human connection remains central to educational practice despite technological advancement.

Finally, teachers increasingly assume responsibility for fostering AI literacy among learners. As AI becomes embedded in social, professional, and educational contexts, students require knowledge and skills to engage with these technologies critically and responsibly. Long and Magerko (2020) define AI literacy as a set of competencies that help individuals understand, evaluate, and interact effectively with AI systems. Teachers, therefore, face the challenge of preparing learners not only to use AI tools but also to recognise their capabilities, limitations, and societal implications. This responsibility aligns with broader educational goals that emphasise critical thinking, informed participation, and responsible technology use.

Taken together, these emerging responsibilities suggest that AI is redefining rather than reducing the professional role of teachers. Facilitation of learning, critical evaluation of information, ethical guidance, instructional design, socio-emotional support, and AI literacy promotion are areas where human expertise remains indispensable. The future of teaching may therefore depend less on competing with intelligent technologies and more on cultivating the uniquely human capacities that technology cannot easily reproduce. Such a transformation carries important implications for teacher education and professional development.

7. Implications for Teacher Education and Professional Development

The evolving role of teachers in AI-supported educational environments necessitates corresponding changes in teacher education and professional development. If educators are expected to facilitate learning, evaluate AI-generated information, address ethical concerns, and promote AI literacy, teacher preparation programmes must equip them with the knowledge and competencies required to fulfil these responsibilities effectively. Consequently, the integration of AI into education presents not only a technological challenge but also a significant educational and professional development agenda.

A fundamental priority involves strengthening AI literacy within teacher education programmes. Teachers cannot guide students in the responsible use of AI if they lack a clear understanding of how these technologies operate and influence learning. AI literacy extends beyond technical proficiency and encompasses awareness of AI systems' capabilities, limitations, risks, and societal implications (Long & Magerko, 2020). Teacher education institutions may therefore need to incorporate foundational AI concepts into pre-service preparation programmes so that future educators can engage critically with emerging technologies rather than merely adopting them as instructional tools.

In addition to AI literacy, teacher education programmes should place greater emphasis on digital pedagogical competence. Effective technology integration requires more than familiarity with digital tools. Teachers must understand how technological resources align with learning objectives, instructional strategies, and assessment practices. Research on educational technology consistently demonstrates that pedagogical considerations exert a stronger influence on learning outcomes than the technology itself (Koehler et al., 2013). As AI applications become more common in classrooms, teacher preparation programmes may need

to focus on helping educators make informed pedagogical decisions regarding when, how, and why AI should support learning activities.

Ethical competence represents another essential area for professional preparation. The increasing use of AI raises questions concerning data privacy, transparency, bias, intellectual ownership, and responsible technology use. UNESCO (2021) emphasises the need for educational systems to promote ethical approaches to AI implementation that safeguard human dignity and social justice. Teachers frequently serve as the first point of guidance when students encounter ethical issues related to technology use. Therefore, teacher education programmes should prepare educators to recognise ethical challenges and facilitate informed discussions about the responsible use of AI in educational settings.

Continuous professional development also assumes greater importance in the context of rapid technological change. AI technologies evolve at a pace that often exceeds the capacity of formal teacher preparation programmes to comprehensively address emerging developments. Consequently, professional learning cannot remain confined to pre-service education. Rather, teachers require ongoing opportunities to update their knowledge, evaluate new technologies, and refine instructional practices. Trust et al. (2016) argue that contemporary professional learning increasingly depends on flexible and collaborative models that support continuous knowledge development. Such approaches may help educators respond more effectively to technological innovations and changing educational demands.

Institutional support further influences teachers' capacity to engage meaningfully with AI. Even highly motivated educators may struggle to integrate AI effectively if schools and educational systems lack appropriate infrastructure, policy guidance, or professional learning opportunities. Successful implementation requires coordinated efforts among teacher education institutions, schools, policymakers, and technology providers. Williamson and Eynon (2020) note that discussions of AI in education often focus on technological possibilities while overlooking the organisational and policy conditions necessary for meaningful educational change. Therefore, institutional readiness remains an important factor in determining whether AI enhances or hinders teaching practice.

Finally, teacher education must preserve the human dimensions of teaching while embracing technological innovation. The growing presence of AI may encourage a narrow emphasis on technical competencies if educational programmes focus exclusively on technological skills. However, the future role of teachers continues to depend on professional judgment, ethical reasoning, communication, empathy, and the ability to foster meaningful human relationships. These capacities remain central to educational practice because they address dimensions of learning that current AI systems cannot adequately replicate. Consequently, teacher education should seek a balanced approach that combines technological preparedness with the development of enduring professional values and human-centred pedagogical expertise.

Overall, the emergence of AI in education requires a reconsideration of how teachers are prepared and supported throughout their professional careers. Strengthening AI literacy, digital pedagogical competence, ethical awareness, continuous professional learning, and institutional support may help educators navigate the opportunities and challenges associated with AI. Such efforts are likely to play a critical role in ensuring that technological innovation enhances rather than diminishes the educational mission of teaching.

8. Conclusion

Artificial intelligence is reshaping educational practice by expanding opportunities for personalised learning, assessment, and instructional support. However, the growing presence of AI does not diminish the importance of teachers. Rather, it highlights the continuing value of human capabilities that remain difficult to automate, including pedagogical judgment, ethical reasoning, creativity, and socio-emotional support.

From a human–AI complementarity perspective, this article argues that the future of teaching lies in collaboration rather than substitution. While AI can assist with routine and data-intensive tasks, teachers remain responsible for interpreting educational contexts, supporting learner development, and ensuring that technology serves meaningful educational purposes. Consequently, the professional role of teachers is evolving from knowledge transmission towards learning facilitation, critical evaluation of AI-generated information, ethical guidance, and AI literacy promotion.

These developments carry important implications for teacher education and professional development. Preparing educators for AI-supported learning environments requires attention not only to technological competence but also to the human-centred dimensions of teaching. Ultimately, the educational value of AI will depend less on technological sophistication and more on how effectively teachers integrate these tools to enhance learning while preserving the human foundations of education.

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Conflict of Interest

The authors declare that they have no conflict of interest.

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A methodological framework for evaluating students' perceptions of institutional policies on anti-ragging

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Abstract

Ragging remains a critical concern in higher education institutions in India, despite the implementation of regulatory measures such as anti-ragging policies. Existing studies have largely relied on descriptive approaches with limited theoretical grounding, thereby restricting the systematic evaluation of policy effectiveness. Addressing this gap, the present study proposes a multidimensional, theory-driven framework for assessing students' perceptions of the implementation of institutional anti-ragging policies. The study integrates four key dimensions, awareness, institutional support, enforcement, and perceived safety, derived from established theoretical perspectives in social psychology, organizational behavior, and policy studies.

A descriptive research design was adopted, and data were collected from 80 students of Banaras Hindu University using a stratified random sampling technique. The researcher developed a 29-item instrument, the Anti-Ragging Policy Perception Scale (split-half reliability = 0.76), to measure students' perceptions across the identified dimensions. The findings indicate that professional students reported relatively higher perception scores than non-professional students. However, chi-square analysis revealed no statistically significant association with course type or gender.

The results suggest that students' perceptions of anti-ragging policies are generally consistent across demographic groups, reflecting a degree of uniformity in institutional implementation. The study highlights that effective policy perception depends not only on awareness but also on institutional support mechanisms, consistent enforcement, and a psychologically safe environment.

The study contributes to the literature by providing a standardized and theoretically grounded framework for evaluating institutional policies in higher education. Practically, this framework serves as a reliable diagnostic tool for higher education institutions to audit policy compliance, identify implementation gaps, and cultivate safer, more supportive campus environments.

Keywords: *Higher education, Anti-ragging policy, Policy evaluation, Scale development, Student perception*

INTRODUCTION

Institutional policies aimed at ensuring student safety and well-being, such as anti-ragging regulations, play a critical role in shaping the educational environment of higher education institutions. In the Indian context, ragging has been widely recognized as a serious social and psychological issue, prompting regulatory interventions by bodies such as the University Grants Commission. While considerable research has examined the prevalence, perception, and impact of ragging, there remains a significant methodological gap in how the effectiveness of such policies is systematically measured and evaluated.

Existing studies in this domain have predominantly relied on descriptive surveys and isolated perception-based findings, often using non-standardized instruments tailored to specific contexts. As a result, comparisons across studies remain limited, and the generalizability of findings is constrained. More importantly, there is a lack of structured frameworks that integrate multiple dimensions of policy perception, including awareness, institutional enforcement, support mechanisms, and perceived safety outcomes.

Addressing this gap, the present study proposes a methodological framework to evaluate students' perceptions of institutional policy implementation. Central to this framework is the development of a structured measurement instrument, designed to capture the multidimensional nature of policy perception in higher education settings. Unlike conventional survey approaches that focus primarily on outcome reporting, this study emphasizes the design, construction, and preliminary validation of a measurement tool adaptable across institutional and policy contexts.

The study operationalizes this framework by developing the Anti-Ragging Policy Perception Scale, a 29-item instrument designed to assess key dimensions of the student experience related to policy implementation. The instrument is applied at Banaras Hindu University as a case study to demonstrate its feasibility and analytical utility. The focus, however, is not limited to the institutional findings; it also extends to the broader methodological implications of designing and validating such tools in educational research.

Background of the Study

It has been rightly said that the end may not always justify the means. Behind the facade of 'welcoming' new students to college, ragging is, in actuality, a notorious practice in which senior students use it as an excuse to harass their junior counterparts and, more often than not, make them easy targets to satisfy their own perverse, sadistic pleasures. Apart from sustaining grievous physical injuries, those unfortunate students who succumb to ragging either develop a fear psychosis that haunts them throughout their lives, or worse, quit their college education even before it begins. For any student who slogs day and night to secure admission into a prestigious college, ragging can be his or her worst nightmare come true. It would not be an exaggeration to say that today, ragging has taken the form of a serious human rights violation, with even the most respected and disciplined educational institutions falling prey to it. Ragging is a disturbing reality in our country's higher education system. There are several rules designed to curb the menace of ragging. Despite this, the problem persists. It has become the new normal in college.

According to the Supreme Court of India, "Ragging means any disorderly conduct, whether by words spoken or written, or by an act which has the effect of teasing, treating or handling with

rudeness any student, including in rowdy or undisciplined activities which causes or are likely to cause annoyance, hardship or psychological harm or to raise fear or apprehension thereof in a fresher or a junior student or asking the student to do any act or perform something which such student will not in the ordinary course and which has the effect of causing or generating a sense of shame or embarrassment so as to adversely affect the psyche of a fresher or a junior student.” (Raghavan Committee Report, 2007). The Anti-Ragging Movement has recently emerged in India. Several voluntary organizations have launched drives to raise public awareness and support victims. Each year, many students are subjected to ragging, with media reporting incidents of suicides, violence, injuries, sexual abuse, and psychological trauma linked to ragging. The judiciary and legislative bodies have addressed the issue through debates and the development of rules and regulations to eradicate it. The Supreme Court has played a notable role in protecting students' rights and raising societal awareness about ragging, actively safeguarding student interests. Before 2009, under UGC regulations, all educational institutions, whether central, provincial, or state, were required to eliminate ragging entirely. These regulations imposed responsibilities on colleges, including proactive measures such as housing freshers separately, conducting surprise night raids by anti-ragging squads, and requiring students and parents to submit affidavits pledging not to partake in ragging.

Despite these regulations, ragging remains a major problem in many colleges across the country. Top institutions like the IITs and NITs have experienced significant instances of ragging that have persisted across generations. According to the latest 2025 report, UGC’s anti-ragging helpline received a total of 1,084 complaints, representing the highest number in the past five years. In this regard, UGC has identified 89 institutions that have failed to submit the mandatory anti-ragging undertakings by students, despite numerous advisories issued (Singh, 2025).

Despite the concerning statistics, some colleges have not faced ragging issues. Over the past three years—since the implementation of Anti-Ragging Regulations—no complaints have been recorded in universities in Nagaland, Andaman and Nicobar, Daman and Diu, Dadra and Nagar Haveli, and Lakshadweep. To prevent ragging, the UGC has established regulations for observing Anti-Ragging Day, which should be celebrated from August 12th to August 18th each year (Singh, 2025). However, considering the positive and negative aspects before and after these policies, further in-depth research is needed to assess the effectiveness of these measures in curbing violence and improving policies. To create a peaceful university environment, students should be free from anxiety and fear related to such activities and attempt to adapt as much as possible.

Research Question

Are students' gender and the type of course they undertake associated with their perception of the institution's anti-ragging policy?

Objective of the Study

- ✧ To identify the existing framework related to policy perception on anti-ragging.
- ✧ To examine the perception of students regarding the anti-ragging policy of their institution.
- ✧ To compare the perception of students on the basis of the type of Course (Professional/ Non-Professional) and Gender.

Null Hypothesis

There is no significant association between students' perceptions and course type (Professional/Non-Professional) and gender.

Delimitation of the study

The study was limited to students in professional and non-professional Degree courses at the Banaras Hindu University main campus, with the purpose of comparing perceptions of the enforcement of the anti-ragging policy at this university.

RESEARCH METHODOLOGY

Research Design:

Based on insights from previous studies, the present research adopts a descriptive research design to examine students' perceptions of their institution's anti-ragging policy. Prior research has largely relied on descriptive and perception-based approaches (Shakhya & Maskey, 2012; Nallapu, 2013; Suryawanshi & Hazari, 2016), which have proven effective in capturing the prevalence and subjective experiences associated with ragging. The cross-sectional nature of the study enables data collection at a single point in time, providing a snapshot of existing attitudes and awareness levels among students.

The chosen methodology is justified by the dominance of survey-based and descriptive methods in existing literature. While earlier studies have effectively captured perceptions and awareness, they also highlight gaps in awareness of legal provisions and variations across demographic groups. Therefore, the present methodology aims to build upon these approaches while ensuring systematic data collection and broader applicability of findings.

Sample of the Study:

In this study, 80 students from Banaras Hindu University (BHU) were selected as the study sample using a stratified random sampling technique, as shown in the following table.

Table 1: Breakup of Sample Participants

Institute	Category of Students	Gender	No. of Students	Total
Banaras Hindu University	Professional	M	24	40
		F	16	
	Non-Professional	M	20	40
		F	20	

A sample size of 80 participants was determined primarily based on practical feasibility and the voluntary nature of student participation. Due to the sensitive nature of the study, obtaining informed consent was essential to ensure voluntary participation and maintain the authenticity and reliability of the responses.

Tool used for the Study:

To operationalize the objectives of the present study, the researcher has constructed a 3-point rating scale, titled the "Anti-Ragging Policy Perception Scale," for data collection, based on reviews of the relevant literature.

Item Generation process:

The development of the Anti-Ragging Policy Perception Scale (ARPPS) followed a systematic, theory-driven approach to ensure conceptual clarity and measurement validity. Items were

generated based on four theoretically grounded dimensions, namely awareness, institutional support, enforcement, and perceived safety. Each dimension was operationalized as measurable indicators, derived from relevant literature and institutional policy guidelines on anti-ragging regulations.

An initial pool of items was constructed to capture both cognitive (knowledge-based) and experiential (perception-based) aspects of policy implementation. The items were designed to be concise, contextually relevant, and reflective of institutional practices, ensuring ease of comprehension among respondents. After the experts' suggestions and item refinement, 29 items were finalized to measure students' perceptions. The entire process is shown in the flowchart below.

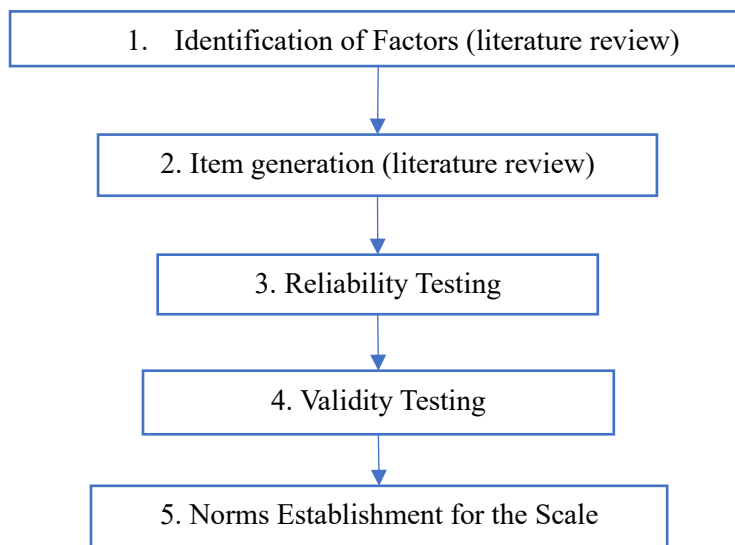


Figure 1: Steps of Scale Development Procedure

Source: The Author

Content Dimensions of the Scale:

1. Awareness: This factor comprises items related to laws, penalties, affidavits, policy knowledge, and the awareness of students within the institution.
2. Institutional Support: This factor comprises items related to counseling services, anti-ragging committees, and administrative mechanisms available within the institution.
3. Enforcement: This factor comprises items related to monitoring, disciplinary actions, and the involvement of authority within the institution.
4. Perceived Safety: This factor comprises items related to comfort, experiences of harassment, and the campus climate encountered by students.

Scoring Procedure:

The instrument employs a three-point rating scale, designed for ease of response and suitability in field-based data collection contexts:

High agreement/ positive response- Score 2

Moderate/ undecided response- Score 1

Low agreement/ negative response- Score 0

For negatively worded items, reverse scoring is applied to maintain directional consistency in the measurement. The serial numbers of the positive and negative items are stated in the following table.

Table 2: Item Analysis

Sl. No.	Types of Items	Serial number of the items	Total
1	Positive	1,2,4,5,6,7,9,11,12,13,14,15,16 17,18,19,20,21,22,23,24,25,29	23
2	Negative	3,8,10,26,27,28	6

Developed Norms:

The norm table was developed to classify perception levels based on mean scores. Lower mean scores were interpreted as indicating low perception, whereas higher mean scores indicated high perception. This approach is supported by treating Likert-type scales as interval data, which allows the use of mean scores for analysis (Likert, 1932), and follows standard practices of score interpretation using class intervals in educational research (Garrett, 2008; Best & Kahn, 2006).

Table 3: The Norms

Sl. No.	Mean Score	Level of Perception
1	Lower mean score	Low Perception
2	Higher mean score	High Perception

According to the table, lower mean scores indicate a low level of perception, reflecting limited awareness, understanding, or sensitivity toward the issue under study. Conversely, higher mean scores indicate a high level of perception, suggesting greater awareness and stronger attitudinal orientation.

Reliability and Validity of the tool:

The reliability of this tool was determined by the split-half method, and the value was found to be 0.76. This value shows that the scale is a reliable instrument for this study. Validity was ascertained by reviewing the items by eminent professors and experts having considerable experience in the field of education and sociology, and suitable modifications were made. The opinion of these specialists confirmed that this was a sufficiently valid tool for this study purpose.

Procedure of Data Collection:

For the data collection purposes of the study, the researcher obtained permission from the respective Principal and the Head/Dean of the departments/faculties visited for data collection at Banaras Hindu University. There, the researcher explained the importance of the study and assured participants that the responses would be used solely for research purposes.

FINDINGS OF THE STUDY:

Objective 1: Identify the Theoretical Framework

The present study develops a theory-grounded framework for measuring student perceptions of institutional policy implementation, conceptualizing policy perception as a multidimensional construct informed by theories from social psychology, organizational behavior, and policy studies. The awareness dimension is rooted in the Knowledge–Attitude framework, which posits that individuals’ perceptions are shaped by their level of knowledge and awareness. According to Martin Fishbein and Icek Ajzen (1975), beliefs derived from knowledge structures influence attitudes, which subsequently guide perception and behavior. In the context of higher education, awareness of institutional policies such as anti-ragging regulations enables students to form informed judgments about their effectiveness. Complementing this, the institutional support dimension is grounded in Perceived Organizational Support Theory, proposed by Robert Eisenberger et al. (1986), which emphasizes that individuals develop positive perceptions when they feel supported and valued by their institution. In educational settings, the availability of support mechanisms such as anti-ragging cells, counseling services, and administrative assistance contributes significantly to shaping students’ trust and perception of policy effectiveness.

The enforcement and perceived safety dimensions are derived from Policy Implementation Theory and Psychological Safety Theory, respectively. Policy Implementation Theory, developed by Jeffrey Pressman and Aaron Wildavsky (1973), asserts that the success of any policy depends on its effective execution, monitoring, and consistent enforcement. In this study, enforcement is reflected through institutional actions such as disciplinary measures, monitoring mechanisms, and administrative responsiveness. Alongside this, Psychological Safety Theory, proposed by Amy Edmondson (1999), highlights that individuals’ perceptions are strongly influenced by their sense of safety and freedom from fear. In higher education environments, especially in the context of anti-ragging policies, students’ feelings of comfort, absence of fear, and protection from harassment are critical in shaping their overall perception. Integrating these theoretical perspectives, the study conceptualizes policy perception as a function of awareness, institutional support, enforcement, and psychological safety, thereby ensuring that the measurement instrument is firmly grounded in established theoretical constructs and offers a comprehensive framework for evaluating institutional policy effectiveness.

From the table 4 (page 25), existing studies largely rely on descriptive methods with a limited theoretical basis, restricting their validity and generalizability. To address this limitation, the framework derives its dimensions from established theories, including the Knowledge–Attitude framework (Ajzen & Fishbein, 1975), Perceived Organizational Support Theory (Eisenberger et al., 1986), Policy Implementation Theory (Pressman & Wildavsky, 1973), and Psychological Safety Theory (Edmondson, 1999). This integration ensures alignment between construct and measurement, enhances methodological rigor, and supports the development of a standardized approach for evaluating institutional policies.

Objective 2: Examine the perception of students regarding the anti-ragging policy of their institution

Institution	Category of Students	Gender	No. of Students	Total	Mean Score
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Banaras Hindu University	Professional	M	24	40	44.62
		F	16		
	Non- Professional	M	20	40	40.85
		F	20		

The table reveals that among students of Banaras Hindu University, 40 professional and 40 non-professional students were selected for the study. In the professional group, 24 were male, and 16 were female, whereas in the non-professional group, male and female students were equally represented with 20 students each. The mean score of professional students (44.62) was higher than that of non-professional students (40.85), indicating a comparatively higher level of the variable under study among professional students.

Objective 3: Significant association between students' perceptions and course type (Professional/Non-Professional) and gender

The third objective of the study is linked to the hypothesis that there is no significant association between students' perceptions and course type (Professional/Non-Professional) and gender. The results of the analysis are presented below.

Table 5: Perception on the basis of Type of Course (Professional/Non-Professional)

Sl. No.	Category of Students	Gender	No. of Students	Total	Chi-Square Value	df	p value	Remarks
1	Professional	M	24	40	0.81	1	0.36	Failed to reject the null hypothesis
		F	16					
2	Non-Professional	M	20	40				
		F	20					

The chi-square test yielded $\chi^2 (1) = 0.81$, $p = .36$. Since the obtained p-value is greater than the standard significance level of .05, the result is not statistically significant. Therefore, the study failed to reject the null hypothesis (H_0), indicating that there is no significant association between gender and student category.

Table 6: Perception on the basis of Gender (Male/Female)

Sl. No.	Gender	Category of Students	No. of Students	Total	Chi-Square Value	df	p value	Remarks
1	Male	Professional	24	40	0.63	1	0.42	Failed to reject the null hypothesis
		Non-Professional	20					
2	Female	Professional	16	40				
		Non-Professional	20					

The chi-square test of independence yielded $\chi^2 (1) = 0.63$, $p = .42$. Since the obtained p-value is greater than the standard significance level of .05, the result is not statistically significant.

Therefore, the study failed to reject the null hypothesis (H0). This indicates that there is no significant association between gender and the category of students.

DISCUSSION:

The present study was conducted with 80 students from the professional and non-professional categories as the study sample to assess their opinions on different aspects of anti-ragging policies and to compare the results by collecting data using the “Anti-Ragging Policy Perception Scale (ARPPS)” for students of Banaras Hindu University.

The scale based on a multidimensional framework comprising awareness, institutional support, enforcement, and perceived safety. This integration reflects a strong alignment with established theories, thereby strengthening both conceptual clarity and measurement validity. The awareness dimension, rooted in the Knowledge–Attitude framework, highlights that students’ understanding of institutional policies plays a foundational role in shaping their perceptions. This is consistent with the proposition that informed individuals are more likely to develop structured attitudes and evaluative judgments.

Similarly, the role of institutional support, as conceptualized in Perceived Organizational Support Theory, emphasizes that students’ perceptions are not merely cognitive but also relational. When institutions provide visible and accessible support systems, such as anti-ragging cells and counseling services, students are more likely to perceive policies as effective and trustworthy. This reflects the importance of institutional responsiveness in fostering positive attitudes.

The enforcement dimension further reinforces the idea that policies cannot be effective in principle alone but must be consistently implemented. Drawing on Policy Implementation Theory, the findings suggest that monitoring mechanisms, disciplinary actions, and administrative engagement significantly shape perceptions. In addition, the inclusion of perceived safety, grounded in Psychological Safety Theory, underscores the emotional and experiential aspect of policy perception. Students’ sense of security and freedom from fear directly influences how they evaluate institutional efforts.

Overall, the integration of these four dimensions addresses a critical gap in existing literature, which often relies on descriptive approaches with limited theoretical grounding. The framework thus provides a comprehensive and theoretically robust basis for assessing institutional policy effectiveness.

The findings reveal that professional students (Mean = 44.62) exhibit higher perception levels compared to non-professional students (Mean = 40.85). This difference, although not statistically tested, suggests a meaningful trend that can be interpreted in light of academic exposure and institutional engagement.

Professional courses often involve structured environments, stricter regulations, and greater interaction with institutional authorities. As a result, students enrolled in such programs may have higher awareness of policies, better access to support systems, and more direct experiences with enforcement mechanisms. This aligns with the theoretical framework, particularly the awareness and institutional support dimensions, indicating that increased exposure leads to more favorable perceptions.

In contrast, non-professional students may experience relatively less structured institutional engagement, which could limit their awareness and interaction with policy mechanisms. This

may result in comparatively lower perception scores. The findings thus highlight the importance of ensuring uniform dissemination of policy information and support services across all academic streams to maintain equity in student experiences.

The chi-square analysis indicates no significant association between students' perceptions and course type or gender. Specifically, the p-values (0.36 for course type and 0.42 for gender) exceed the standard significance level of 0.05, leading to the acceptance of the null hypothesis in both cases.

The absence of gender-based differences is particularly noteworthy, as it suggests that institutional policies are perceived relatively uniformly by both male and female students. This may indicate equitable implementation of anti-ragging measures and comparable access to institutional resources and support systems.

Likewise, the lack of significant association with course type suggests that institutional policies are broadly consistent in their reach and impact, even though minor variations in perception levels exist. This reinforces the idea that effective policy implementation transcends demographic and academic categories when grounded in strong institutional practices.

CONCLUSION:

The present study concludes that students' perceptions of institutional anti-ragging policies are best understood through a multidimensional, theory-driven framework integrating awareness, institutional support, enforcement, and perceived safety. By grounding the measurement in established theoretical perspectives, the study not only enhances conceptual clarity but also ensures methodological rigor in assessing policy effectiveness.

The investigation revealed that students have a positive response regarding the implementation of the anti-ragging policy at BHU. To gain a clearer perspective, the researcher formulated a null hypothesis and demonstrated that there was no significant association between students' responses and their course type or gender. This is particularly evident given the unique perspective of categorizing students into two groups. Previous research indicated that professional students (Nallapu, 2013) supported such activities; however, this may not be true for this institution and its professional students. Additionally, studies by Sharma (2013) and Rao (2018) suggested that male students are more frequently involved in such activities and respond more positively to ragging compared to female students. Nonetheless, this has been refuted by the current study, which found that both female and male students are aware of the anti-ragging policies and support these regulations, feeling comfortable within the college environment. This research represents a positive development for this institution and provides a guiding framework for other institutions where regulations may not be taken seriously.

Lastly, the study contributes to the existing body of knowledge by offering a comprehensive and theoretically grounded framework for evaluating institutional policies in higher education. It also provides practical implications for institutions to strengthen awareness initiatives, enhance support systems, ensure rigorous enforcement, and foster a safe campus climate, thereby improving the overall effectiveness and perception of anti-ragging policies.

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Declaration of Conflicts of Interest:

The authors are declaring that there are no conflicts of interest between them related to this research and the authorship of this paper.

Ethical approval and Informed Consent statements

This study adhered to ethical standards associated with secondary research on Institutional policies, which were preferred for developing our tool. All data sources were from publicly accessible academic resources. Consequently, no ethical approval or informed consent was required for this research. The authors declare that there are no conflicts of interest associated with this work.

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Authors Contribution:

Dr. Yogendra Kumar Prajapati and Laxmipriya Kanti worked together to develop and design the study. Laxmipriya Kanti collected the data and conducted the initial analysis. Both authors made equal contributions to the article's preparation and the framework's development. Dr. Yogendra Kumar Prajapati reviewed and revised the original draft, which was written by Laxmipriya Kanti, to ensure that it was logical and academically sound. Both authors, who are also accountable for every aspect of the work, approved the manuscript's final draft.

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Table 4: Policy Perception Framework

Dimension	Underlying Theory	Key Theoretical Idea	Core Concept in Theory	Operational Indicators in Study	Example Items from Instrument	Authors
Awareness	Knowledge –Attitude Framework (Cognitive Awareness Theory)	Perception is formed based on knowledge and awareness	Knowledge influences attitudes and perception formation	Awareness of rules, laws, penalties , procedures	Awareness of anti-ragging laws, affidavits, penalties	Ajzen & Fishbein (1975)
Institutional Support	Perceived Organizational Support Theory	Individuals form positive perceptions when they feel supported by the institution	Organizational care and support influence attitudes and trust	Availability of support systems, counseling, anti-ragging cells	Presence of anti-ragging cell, counseling services, administrative help	Eisenberger et al. (1986)
Enforcement	Policy Implementation Theory	Policy effectiveness depends on actual implementation and enforcement	Monitoring , execution, and consistency determine policy success	Monitoring by authorities, disciplinary action, institutional response	Authority action, anti-ragging committee involvement, rule enforcement	Pressman & Wildavsky (1973)
Perceived Safety	Psychological Safety Theory	Perception depends on feeling safe and free from fear or harm	Psychological comfort influences behavior and perception	Comfort level, absence of fear, experience of harassment	Feeling safe on campus, absence of ragging, comfort with environment	Edmondson (1999)



Redefining power structures: Teacher leadership and distributed management in education

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Abstract: The hierarchical nature of different institutional arrangements, especially those that are entrenched in the Indian context, has, historically and to some extent, suppressed the agency of teachers, hampered innovation, and reduced their responsiveness to the changing needs of modern education. The centralisation of authorities, which is based on these top-down structures with roots in colonial bureaucratic legacies, limits the power to make professional decisions and empower teachers. It presents a perspective on the future of teacher leadership, as conceptualised by the authors as an informal, expertise-based influence that is not confined to the classroom setting, but redefines leadership as a distributed, place-based praxis. This reconceptualization aims at reducing rigorous hierarchies through the prism of distributed management principles. Based on the development of distributed leadership as an emergent phenomenon by Spillane and others, which is built upon the interactions between actors, contexts, and artefacts, the paper will incorporate teacher-leadership conceptions that forecast empowerment, the development of professional communities, and influence within the school system. Theoretical underpinnings based on organisational learning, social constructivism, analysis of managerialism, and ideas of relational power support the suggestion that the hierarchies can be redesigned into horizontal, networked interdependencies. The Consistent model proposed is the Distributed Teacher Leadership Model (DTLM) that aligns the mobilisation of instructional leaders into distributed systems and the decentralisation of hierarchical structures and processes of interdependence and redistribution of authority and development of adaptability, agency, and collective efficacy. In addition, the DTLM aligns with the focus on teacher empowerment and decentralised governance outlined in the National Education Policy (NEP 2020), which provides conceptual connections between bureaucratic structures in their inner core based on equitable and democratic processes. The model achieves international pertinence with its appeal to the larger paradigm shift that is post-heroic, relational leadership in the complex educational contexts. The authors observe that distributed teacher leadership is potentially transformative to the development of responsive and inclusive organisations, but conclude by accepting that additional theoretical development, especially relating to critical social-justice and post-colonial aspects, is still achievable.

Keywords: *Teacher leadership, Distributed leadership, Distributed management principles, Hierarchical flattening, Relational power, Organisational adaptability.*

1. INTRODUCTION

Indian educational institutions in India are historically shaped by colonial top-down hierarchies (as in the rest of the world), where the collective power is concentrated in the hands of principals, district education officers, and top-level administrative authorities. This form of organisation is a legacy of colonial administrative structures, which were structured to achieve centralised control and homogeneity, and which continued into the post-independence era through state-controlled systems (Government of India, 2020). Indian schooling is operated according to a federal model: the Ministry of Education (previously the Ministry of Human Resource Development) sets up policies at the national level, and state governments implement these policies through directorates, district officers, and local bodies (Wikipedia, 2025). These systems of arrangements are indicative of well-documented systems of bureaucratic education based on the management of the industrial era, which focused more on efficiency and control (Spillane, 2006). These hierarchies in India tend to reflect the stratifications in the society, such as caste-like scales in which decision-making is still positional and thus limits the teacher participation (Indian Express, 2020).

Such inflexible structures remain even with the changing educational requirements, creating a lot of theoretical dilemmas. The hierarchical models are inappropriate to respond to modern complexities, including the needs of diverse learners, technological adoption, equity priorities, and fast changes in policies, as an example of a National Education Policy (NEP 2020) (Government of India, 2020). They discredit teacher agency, which is the ability to make use of professional judgment, to innovate in pedagogy, and to affect the practices in the school, and prevent the responsive actions to challenges in such areas as inclusion in the Right to Education Act, student disengagement, and curriculum reform (Frontiers in Education, 2025, 8). Indian educators often must deal with administrative overload, lack of autonomy, and hierarchy that worsens their morale, lack of innovation, and inequities (Nawani, as cited in Indian Express, 2020). Similar models are a problem in reducing collective efficacy and responsiveness all over the world (Spillane et al., 2001; Spillane, 2006).

This paper attempts to theoretically analyse how teacher leadership, as the expertise-based influence of teachers that extends beyond the classroom, beyond collaboration and initiative and is entrenched in distributed management, can transform leadership from positional power to situated practice. Based on the distributed leadership theory, leadership is argued as the face of interactions between people, objects, and situations, but not confined to positions of authority (Spillane, 2006).

The conceptual questions to be guided are:

- How do the distributed leadership theories reverse the hierarchical assumptions?
- In what way would teacher leadership theoretically lead to the reallocation of influence and authority?

What are the more general conceptual implications of power relations and school organisations?

This work has theoretical importance because it contributed to changing the discussion on educational leadership, in particular, the transition to post-heroic and relational paradigms. It promotes the view of leadership as emergent, interactive, and practice-based, distributed

individualistic, hierarchical paradigms, and democratic, adaptive organisations (Harris, 2008, as cited in other distributed leadership reviews). This exploration is especially relevant in the context of NEP 2020, which in India supports teacher empowerment, holistic education and flexibility but faces barriers in hierarchical implementation (Government of India, 2020). The findings have universal appeal as they reflect worldwide changes from centralised to collaborative models with the growing complexity.

The importance of this paper lies in its potential to advance policy and conceptual change. It offers theoretically useful tools in reducing hierarchical stratification in diverse settings with limited resources, like India, by means of a combination of distributed leadership and teacher leadership, thus promoting equity, professional agency, and sustainable change. It is a work that connects international theoretical concepts, such as those exemplified by Spillane, with Indian realities, whereby bureaucratic opposition is coupled with the desire to be reformative, hence affecting the emergence of more inclusive educational governance.

The paper will be structured in the following way: Section 3 provides the conceptual definition and identifies the key constructs; Section 4 is a literature review; Section 5 is a conceptual analysis; and finally, Section 7 suggests an integrated conceptual model; Section 8 gives the theoretical implications, and finally, Section 9 will reflect and give future directions.

2. THEORY CONCEPTUAL DEFINITIONS AND KEY CONSTRUCTS

The concept of teacher leadership is defined as a non-structured and expertise-based power that teachers have outside of their respective classrooms with an emphasis on agency, collaboration, and pedagogical leadership to enhance teaching and learning practices and schoolwide practices. This idea makes teachers active participants in the teaching process, which helps them to contribute to the professional development of their peers, influence the decision-making process, and improve student performance with their teaching experience. Teacher leadership in an Indian setting is still limited by the old hierarchies, in which bureaucratic frameworks restrict teacher autonomy and initiative (Government of India, 2020). The National Education Policy (NEP) 2020 aims to solve that by empowering educators with professional development, mentorship, and acknowledging teachers with critical responsibilities in reform, restoring dignity and agency in a system that was previously dominated by administration (Government of India, 2020). Seminal reviews around the world refer to teacher leadership as the influence of positions outside the classroom, including support of learning among peers, policy impact, and student achievement goals with no official positional power (Wenner and Campbell, 2017; York-Barr and Duke, 2004). This is in line with the efforts of NEP 2020 to promote teacher-led innovation in India due to the prevailing issues, such as administrative overwork and insufficient professional voice.

These are **distributed management/leadership** where leadership is conceptualised as practised by dynamic interactions between leaders and followers and situational contexts, instead of being vested in formal authority figures, which is more based upon the views of Spillane et al. Leadership becomes a practice that is spread over people, tools, routines, and environments, and focuses more on collective performance rather than heroic performance (Spillane, 2006). This perspective criticises centralised models because it views leadership as an organisational asset that emerges from interdependent actions. Distributed leadership can

provide an avenue of decentralizing influence and encouraging collaboration in Indian schools where, due to colonial legacies, hierarchical bureaucracies with strong top-down structures still exist, and NEP 2020 encourages the use of teacher empowerment and shared responsibility (Government of India, 2020). Distributed leadership has become popular throughout the world as a reaction to complexity, providing adaptive practices through collective wisdom, and diminishing the need to rely on positional leaders (Harris, 2008, as cited in distributed leadership literature; Spillane et al., 2001, as cited in Spillane, 2006). Similarities in India underscore how it is likely to solve the problem of teacher inability to be empowered in bureaucracies and capitalise on the world trend that favours relational and practice-driven models.

Rethinking hierarchies entails the abandonment of vertical, positional control whereby authority moves downwards through chains of command which are strict, rigid, and inflexible to horizontal, networked interdependence which is characterised by emergent, collaborative interactions. This change is based on the activity theory and distributed cognition, and it presents leadership as being situated within activity systems that comprise subjects, objects, tools, rules, communities, and divisions of labour (Spillane, 2006; Wikipedia, 2025). Activity theory sheds light on the way leadership is created through a combination of actions and not through roles, and the distributed cognition perceives knowledge and power as social extensions. In India, a reconsideration of hierarchies opposes the setting of bureaucratic models that reflect the fragmentation of society and restrict flexibility (Indian Express, 2020). This is implicitly supported by NEP 2020, which proposes the principles of autonomy, fewer silos, and teacher-centred reforms to flatten the structures and ensure equity (Government of India, 2020). This reconceptualization is a critique of managerialism globally, with preference given to networked constructions that help promote innovation and responsiveness in the complex education contexts.

There are **differences and interrelations** between these concepts, but these are synergistic. Teacher leadership gives the authority and competence that operationalise distributed management, and as such, teachers can exercise influence in a non-positional manner. The theoretical perspective of distributed management provides a prism through which to perceive leadership as situated and interactive and refute the hierarchical assumptions on which teacher leadership is based. The rethinking of hierarchies is the general objective, and distributed management and teacher leadership are the means to realise the flatter and more balanced structures. These interconnections are used to solve long-standing problems: hierarchical rigidity reduces teacher agency, and distributed strategies and teacher leadership (in accordance with the empowerment of NEP 2020) provide an opportunity for interdependence and collaboration. On an international front, such cross-relations demand individualistic paradigms and promote relational frameworks, which contribute to collective efficacy and flexibility. The combination of them creates a unified model of changing educational organisations into non-bureaucratic but inclusive structures.

3. THEORETICAL FOUNDATIONS

The main theory of anchoring that will be used in this article is Distributed Leadership Theory, as explained by Spillane, Halverson, and Diamond (2004), which views leadership as an emergent practice that is shared among people, situations, and equipment as opposed to being among positional leaders. In this viewpoint, leadership is extended across interactions within organisational interactions and how routines, artefacts, and social relations are co-constructive of leadership activities (Spillane et al., 2004). With bureaucratic hierarchies prevailing as the norm in the Indian educational system, under policies like the National Education Policy (NEP) 2020, where distributed leadership provides an alternative narrative to centralised control, shared decision-making is a solution to issues related to shortages of teachers and even distributions of resources (Government of India, 2020). For instance, within the Indian higher education sector, distributed leadership has already been associated with better institutional performance because of the decentralisation of power between faculty and administrators and the reduction of the impact of top-down governments inherited during colonialism (Bhola and Dhanawade, 2024). This theory reflects changes in the western world, where it opposes heroic models of leadership by enhancing the flexibility of leadership in challenging situations as observed in school reforms in the U.S and U.K (Spillane, 2006).

To supplement this is the **Teacher Leadership Frameworks**, which focus on empowerment, professional communities, and school-wide influence. York-Barr and Duke (2004) produced a synthesis of two decades, which conceptualised teacher leadership as a process in which teachers, either individually or in groups of teachers, have an impact on their peers, principals, and stakeholders, to enhance teaching and learning. Wenner and Campbell (2017) built on it by reviewing empirical foundations by focusing on the role of teacher leadership in professional learning communities and policy implementation. In India, NEP 2020 puts teachers in the lead by requiring them to engage in continuous professional development, mentoring, and curriculum innovation, to advance their role in a system where they tend to be subordinated in administration (Government of India, 2020). This is in line with the attempts to incorporate teacher-based efforts in rural educational establishments where there are equity gaps that are elevated by the spirit of hierarchy (Kumar and Choudhury, 2024). These models are a duplicate across the world, where European and North American models have shown teacher leadership to improve retention and student performance through the establishment of collaborative networks across the classroom walls.

The theories that support this are also an enrichment. **Organisational learning theory**, which was developed by Argyris and Schoen (1978), assumes that organisations learn in the process of single loop and in the process of double loop, wherein assumptions made by people are questioned to facilitate adaptive change (Argyris and Schoen, 1978). This was extended by Senge (1990) to the learning organisations, where the focus is on systems thinking and shared vision. This helps NEP 2020 in Indian education to encourage reflection in the face of quick reforms with the aim of topping inflexible bureaucracies that choke innovation. On an international level, it is like corporate and educational applications of promoting ongoing improvement.

Social constructivism is based on the work of Vygotsky (1978), and it considers knowledge as having been constructed socially in interaction, where scaffolded learning is emphasised by

such concepts as the zone of proximal development. In India, NEP 2020 is based on this theory as it focuses on collaborative pedagogies to overcome cultural and socioeconomic barriers. It educates inclusive education designs in the whole world.

Managerialism is criticised based on efficiency-conscious managerial practices like commodification of education, which Deem (2003) refers to, and advocating for performative cultures that destroy professional autonomy. In India, this condemns NEP implementation in situations of resource deficiency, in favour of relational options.

The Foucaultian-based relational approaches to power perceive power as circulatory and productive, which are entrenched within discourses that constitute subjectivities (Foucault, 1980). The concept is applied by Ball (2013) in the education field, where he criticises the way policies are used to create control. This displays the perpetuation of inequities in India through hierarchies, and it also condemns the neoliberal reforms in other parts of the world.

All these theories contribute to reevaluating the hierarchies in education, to be horizontal networks rather than vertical control. The models of distributed leadership and teacher provide avenues of power distribution, but the organisational learning and social constructivism facilitate the provision of adaptive and collaborative cultures. Managerialism and Foucauldian power critique discourses depict the existence of hierarchical weaknesses and offer fair and just relationships of power. Therefore, India is aligned with the NEP 2020 vision of empowered and inclusive systems as the globe is shifting towards democratic education in complexity.

4. CRITICAL REVIEW OF THE LITERATURE

The movement of leadership theories in education is also an aspect of how leadership was based on individualistic and top-down approaches, but nowadays, with the growing complexities in teaching and learning, leadership is increasingly adopting collaborative and inclusive models. Conventionally, the leadership was mainly instructional, which emphasised the direct observation of curriculum and instruction by principals to enhance student performance (Hallinger, 2005). This became transformational leadership that focuses on setting a vision, motivation, and cultural change to motivate employees (Leithwood and Jantzi, 2005). At the beginning of the 2000s, the paradigms of distributed and shared leadership developed, redefining leadership as a group practice that is shared among stakeholders, and which is determined by situational factors (Spillane, 2006; Gronn, 2002). The evolution in India reflects the trends on the global level, but it is influenced by the colonial experiences of bureaucratic power, where the leadership has been concentrated within the hands of principals and district officers (Government of India, 2020). The use of the National Education Policy (NEP) 2020 as a turning point in favour of distributed models and supporting the empowerment of teachers and participatory governance is a move to support inequity and holistic education (Bhola and Dhanawade, 2024). This is like what happens in the West, whereby reform in a distributed leadership context is a response to the accountability pressure and the multiple student needs, which lead to innovation when responsibility is shared (Harris, 2008).

Classical literature has provided the basis of distributed leadership and teacher leadership. The concept of leadership presented in Spillane (2006) is based on the works of a scholar who

viewed leadership as an emergent practice extended across relationships between leaders and followers, as well as contexts, indicating the importance of tools and routines when it comes to school improvement. This is expanded by Harris (2008) and Gronn (2002), who discuss the implications, the ability of distributed leadership to build capacity and the possibility of a concertive action model, respectively, whereby leadership is the result of hybrid group and individual formations. Synthesising on teacher leadership, York-Barr and Duke (2004) defined teacher leadership as the influence of teachers on peers and decisions made at the school level to support learning. Wenner and Campbell (2017) developed further and considered the empirical foundations and emphasised the role of teacher leadership in the professional community. These ideas are reflected in the focus of NEP 2020 on teacher-led innovation, but adjusted to hierarchical settings (in India); Bhola and Dhanawade (2024) use distributed models in the Indian higher education sector with antecedents such as supportive cultures. These works are similar to those in the United States and the United Kingdom, whereby distributed leadership increases resilience in the organisation (Spillane et al., 2004).

These paradigms have major controversies and conflicts. There are still conceptual uncertainties, and distributed leadership has not been defined very well, which is why it overlaps with shared or collaborative models and may be misapplied (Harris, 2014). Diffused accountability risks are the result of a situation where leadership is too thin, which then dilutes responsibility and makes it hard to assess (Gronn, 2009). The state of power imbalances persists since formal leaders might be opposed to redistribution, and this maintains inequities (Crawford, 2012). Whether in a hierarchy or not, there are issues of cultural resistance to flattening structures. These tensions are sharp in India, where bureaucratic tradition and the caste-like orders make aspirations distributed by NEP 2020 experience barriers to implementation in the form of resource shortage and bureaucratic overwork (Indian Express, 2020). Otherwise, the same problems are observed in various locations around the world, where the power relations do not grant fair involvement (Williams, 2011).

The theoretical gaps are not well explored. The mechanisms of redistribution of power are poorly theorised, and there are fewer models of influencing negotiations in unequal formations (Mifsud, 2021). The distributed interactions, such as gender, caste, or socioeconomic status, and intersectionality, are ignored, which may cause even more exclusion (Crawford, 2012). The implications of equity need to be considered in more detail, especially how distributed leadership is used or used to enhance disparities in diverse populations. The concept of sustainability in diverse environments, such as those in resource-poor or non-Western environments, does not have longitudinal structures. The gaps in India are adapting the global theories to the realities of multiculturalism, and NEP 2020 identified the need to implement equity-oriented sustainability in urban-rural differences (Kumar and Choudhury, 2024). Internationally, these are concurrent calls toward situational research in developing countries, between theory and practice towards inclusive results (Tian et al., 2016).

Teacher leadership is a multi-dimensional construct that goes beyond the conventional classroom walls. Cheung et al. (2018) gives a foundational base for limiting the non-positional roles whereas Blank (2021) uses survey method to evaluate the dimensions like instructional collaboration, professional advocacy and curriculum development. Fostering the capacities

asks for administrative support in school districts for a steady progress (Eckert & Daughtrey, 2019; Simpson, 2021). Crucially, leadership styles and teacher's psychological capital are mediating factors that give confidence and resilience to both new and proficient educators to take leadership roles (Cheng & Szeto, 2016; Zhang et al., 2022). Teacher leadership is one of the primary driver of school improvement and bringing equity in educational achievements across multicultural landscapes as found in studies in UK (Muijs & Harris, 2006) and Shanghai (Pang & Miao, 2017). Recent research underscores the positive impact of virtual communities of practice (vCoPs), where teacher agency and distributed leadership interact to bring in dynamism and global innovation (Shah et al., 2024).

5. METHODOLOGY

A theory building conceptual analysis has been used to reduce the gap between localised policy implementation and global educational leadership paradigms. The study operates within a Critical- Relational meta-theoretical paradigm. It is dependent on relational perspectives which look at leadership as a distributed practice placed within interactions instead of positional authority. Meanwhile a critical lens has been applied to deconstruct the colonial legacies and caste-class stratifications in India. The objective is to generate a theoretical blueprint that can conceptualise how hierarchical flattening functions in resource scarce situations. The literature was purposively chosen to develop a dialogue between contemporary empirical evidence, real time policy contexts, and classical theoretical frameworks. The selection of papers was done in three tiers. The first tier was using the conceptual authors from foundational texts in distributed leadership and teacher leadership. The second tier saw the use of policy documents like NEP 2020 and socio-cultural artifacts like Indian express and open-source encyclopaedia like Wikipedia. This gives the ground level realities and constraints like administrative overload and bureaucratic resistance. In the third-tier international studies were reviewed to give a global base to the paper. The analysis of the literature was done using deconstruction, synergistic integration, and model construction. Deconstruction saw usage of Foucauldian post-structural lenses and managerialism. the traditional models were critically analysed to bring out their limitations. While undergoing the synergistic integration teacher leadership provided the pedagogical expertise and the agency required to act as a catalyst while distributed leadership management provides the prism for this influence to exist non-positionally.

6. CONCEPTUAL ANALYSIS

The conceptual processes of redesigning hierarchies in schools and colleges entail a challenge to vertical hierarchies, and so are in favour of more permeable, accommodative forms. The distribution of leadership functions by means of distributed management is one of these mechanisms that reduces the reliance on single positional leaders by redistributing power among many actors and situations. Based on the distributed leadership theory presented by Spillane (2006), the aspect of leadership is not a personal characteristic but a practice represented by association and tools, and routines that provide an opportunity to solve problems collectively. This dispersion is consistent with the focus of the National Education Policy (NEP) 2020 on decentralising governance in India to enhance the capacity of local stakeholders in educational systems, which are deeply rooted in bureaucracies that were established during

colonial rule (Government of India, 2020). As an example, NEP supports the idea of school management committees with the participation of teachers and parents, with less part of principals or district officers, and overcoming the inefficiency of resource distribution in the face of multiregional needs (Bhola & Dhanawade, 2024). On the global scale, the mechanism is similar to the reforms in the Western systems, including the U.S. school districts that have adopted the distributed models in their efforts to become more responsive to the contextual nuances of the multicultural setting, where the singular leadership model is frequently not able to perceive the situational context (Spillane et al., 2004).

Teacher leadership is central to such a rethinking because it helps to make teachers co-constructors of practice, and to contest vertical authority, by exerting influence based on expertise. Leadership frameworks of teacher leadership reimburse conceptualising teachers as agents, who are involved in curriculum, professional development, and policy, which consequently flatten hierarchies (York-Barr & Duke, 2004; Wenner and Campbell, 2017). This is essential in the Indian context amid NEP 2020, where teacher-led innovation is promoted, with teachers having an opportunity to co-design practices to overcome such challenges as linguistic diversity and inclusion, overcoming top-down requirements that suppress agency (Kumar & Choudhury, 2024). As an illustration, in Indian rural schools, the leadership programs of teachers have allowed joint lesson planning, disrupting the dominance of administration, and promoting equity (Indian Express, 2020). This connector role is replicated in other parts of the world, as European systems, teachers as co-creators offer greater efficacy in schools, a fissure between policy and practice in the hierarchical systems (Harris, 2008).

Mechanisms that support such changes are also based on theoretical processes which shed more light on the change. According to the activity theory, interdependence and the situated interaction have led to collaborative decision-making because the leadership is developed through networks of actors, tools and communities of actors as opposed to individual directives (Spillane, 2006). This is filled in by social constructivism, which sees knowledge as co-constructed in dialogue, which further allows the teacher to negotiate practices in real-time (Vygotsky, 1978). In India, this process underpins the vision of NEP 2020 of multidisciplinary learning, where teams that rely on each other to solve challenging problems are present, no longer established by bureaucratic silos. It is similar to organisational learning worldwide in the Scandinavian education, where situational interactions result in the cultivation of adaptive curricula (Senge, 1990).

Another process is power changes based on hierarchical control to negotiated, relational influence and is informed by relational views on power that view it as circulatory, embedded in discourses (Foucault, 1980; Ball, 2013). The critique of managerialism points to the redistribution of power across distributed approaches to take away the performative pressures and put the voices of the marginalised into the limelight (Deem, 2003). The change in India is an opposition to caste-type hierarchies in schooling that allows relational bargains in NEP to ensure social justice. It is a global campaign against neoliberal inequities in the schools of the United Kingdom and is therefore an inclusive influence.

It results in enhanced organisational adaptability, teacher agency, and collective efficacy, and the organisational learning theory makes it possible to question assumptions in a double loop to support resilient systems (Argyris and Schoen, 1978). This will enable responsiveness to post-pandemic challenges in India, which increases agency through the professional communities of NEP. It reflects the U.S. reforms on a global level where collective efficacy enhances performance in different districts (Gronn, 2002).

Possible counterarguments are idealism, in which distributed models disregard physical limitations (Harris, 2014). This can theoretically be countered through focusing on the contextual adjustment in the sense that Spillane (2006) proposes situated practices. Accountability is at risk of diffusion due to dilution of responsibility (Gronn, 2009), which is refuted by hybrid models that balance between dispersion and explicit roles (Crawford, 2012). Such resistance to change of culture in a hierarchical society, as the bureaucratic norms in India, is addressed by the slow integration through policy framework such as NEP 2020, inspired by other experiences of successful cultural change in the world (Tian et al., 2016). These reactions highlight the possibility of redefining hierarchies using subtle theory.

7. PROPOSED CONCEPTUAL MODEL

In this section, the cohesive theoretical framework, dubbed the Distributed Teacher Leadership Model (DTLM) of Hierarchical Flattening, will be synthesized connecting the implementation of teacher leadership in distributed management provisions to the reconceptualization process of educational hierarchies and their flattening. The DTLM is based on distributed leadership theory (Spillane, 2006), teacher leadership theories (York-Barr and Duke, 2004; Wenner and Campbell, 2017), and other supporting theories, including organizational learning (Argyris and Schoen, 1978), social constructivism (Vygotsky, 1978), criticism of managerialism (Deem, 2003), and relational views of power (Foucault, 1980; Ball, 20). Distributed arrangements can make rigid chains of command less steep to eliminate such factors as teacher disempowerment and uneven resource allocation, and in the Indian context, where bureaucratic hierarchies continue to exist based on the colonial legacies (Government of India, 2020), the model refers to the theme of teacher empowerment and decentralized governance within the National Education Policy (NEP) 2020 (Bhola and Dhanawade, 2024). The DTLM is similar to the changes in Western education systems, including U.S. and U.K. reforms to focus on collective leadership models instead of heroic leadership models in the face of growing complexity and diversity (Harris, 2008; Gronn, 2002).

The DTLM has four main components, namely (a) Teacher Leadership Enactment, (b) Distributed Management Arrangements, (c) Processes of Interdependence and Redistribution of Power, and (d) Results of Hierarchical Flattening. These elements exist as a dynamic, cyclical structure in which the teacher leadership initiates an influence in the distributed structure, which creates a process that gives rise to flattened hierarchies and greater organisational performance, contributing to further enactment. Teacher Leadership Enactment is the practice where teachers act informally in an expertise-based manner by means of collaboration and innovation, which is the entry point of change (Wenner and Campbell, 2017). Distributed Management Arrangements offer the structural setting, with the launching of

leadership functions distributed among actors, tools, and situations (Spillane et al., 2004). The transition is mediated by Processes of Interdependence and Power Redistribution and facilitated by interdependence that promotes situated interactions (Vygotsky, 1978) and power changes that make the difference into negotiated influence (Ball, 2013). The results are increased adaptability, teacher agency, and collective efficacy that will maintain the flattened organisation (Senge, 1990).

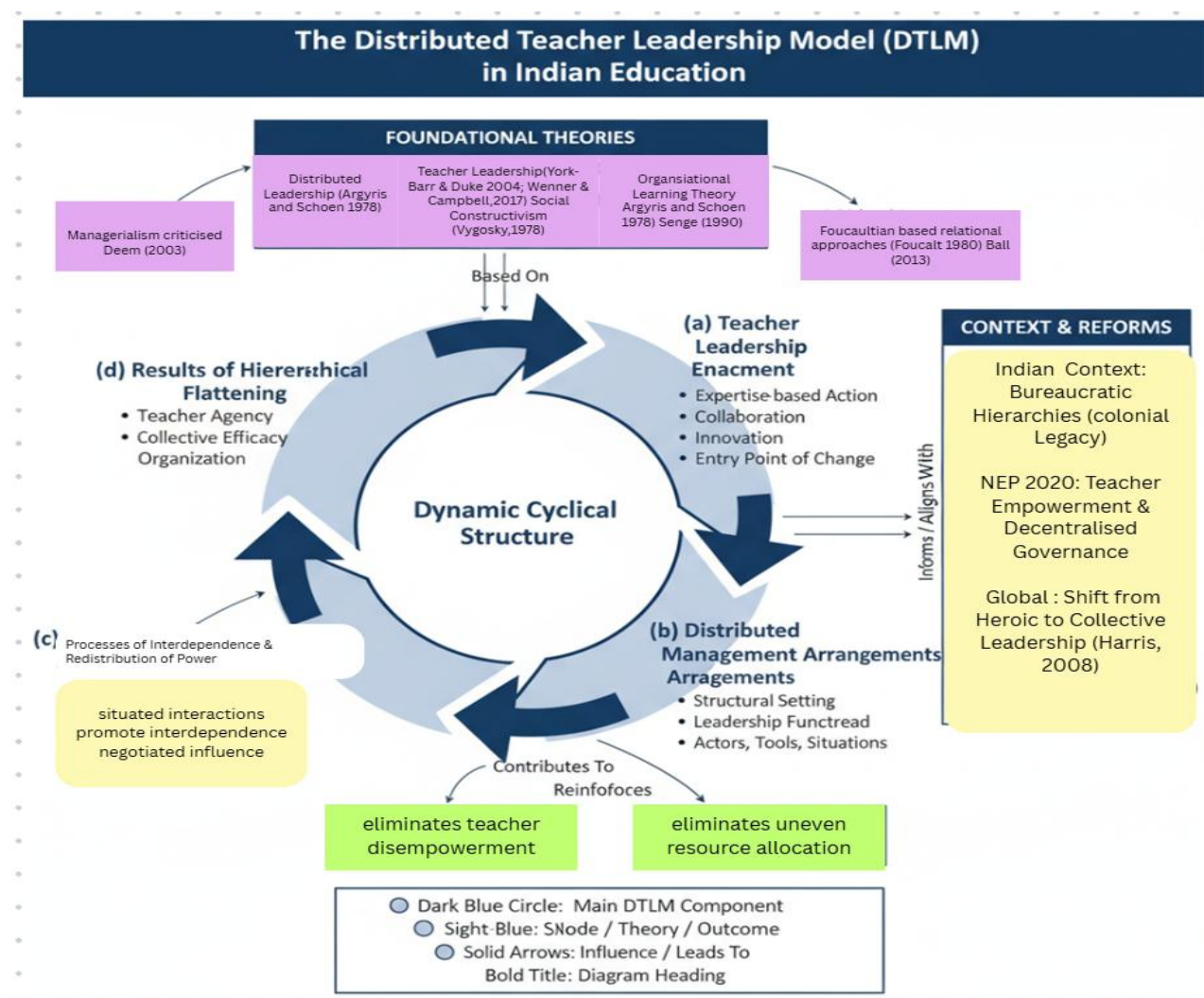


Figure 1 The Distributed Teacher Leadership Model In India made by authors using Canva To illustrate, Table 1 outlines the components and their relationships.

In India, relationship is demonstrated by the promotion of school complexes and teacher clusters in NEP 2020, where teacher enactment in the distributed arrangements would redistribute power between the district officers and collateralised groups, and provide adaptable responses to regional disparities (Kumar and Choudhury, 2024). The same dynamics are taking place in Scandinavian models of interdependence around the world, flattening hierarchies, to ensure inclusive education (Tian et al., 2016).

Table 1 components and their relationships of teacher leadership

Component	Description	Relationships to Other Components
Teacher Leadership Enactment	An agency and pedagogical expertise-based informal influence by teachers outside classrooms (York-Barr and Duke, 2004).	Triggers in Distributed Management Arrangements trigger Processes of Interdependence, adding to the result by questioning vertical authority.
Distributed Management Arrangements	Leadership as emergent practice was the one that spanned over people, situations, and tools (Spillane, 2006).	Gives context to Teacher Leadership Enactment; facilitates Processes by means of dispersion; results in Outcomes by means of less positional dependence.
Processes of Interdependence and Power Redistribution	Relational power turns into negotiating situations and situational interactions instead of control (Vygotsky, 1978; Foucault, 1980).	Facilitates between Enactment/ Arrangements and Outcomes; promotes cooperation in NEP-led reforms in India (Government of India, 2020).
Outcomes of Hierarchical Flattening	Increased adaptability, agency, and efficacy in fair structures (Argyris and Schoen, 1978).	Enhances the cyclical feedback to Enactment and Arrangements; endorses the sustainability within multiple environments.

The DTLM fosters the knowledge of leadership as an emerging and relationship process by redefining it outside of positional qualities. According to the distributed theory, leadership is a result of interactions in situated contexts, whereby actions of teachers are used to co-construct practices, and not to follow directions (Spillane, 2006). It is relational because the negotiations of powers circulate the power and criticise the managerial hierarchies where roles are commoditised (Deem, 2003; Ball, 2013). This development reverses caste-like educational segregations in India, where leadership is considered co-constructed in the professional circles according to NEP 2020, which improves relational equity (Indian Express, 2020). On the global level, it is similar to post-heroic paradigms in Australian and Canadian contexts, which focus on emergence in networked systems (Gronn, 2009; Harris, 2014).

The explanatory power of the model in explaining concepts of educational reform is that it can guide policies and practices to bring about sustainable change. It documents how teacher leadership can be combined with distributed management with the aim of flattening hierarchies and provides a blueprint to such reforms as the NEP 2020 emphasis on autonomy and inclusion,

foreshadowing better efficacy in resolving digital and socioeconomic inequalities (Bhola and Dhanawade, 2024). It clarifies changes in OECD nations globally, as distributed strategies increase responsiveness in the face of globalization that offers theoretical solutions to equity-oriented changes (Crawford, 2012). The DTLM emphasises cyclical reinforcements, which emphasise long-term sustainability, and is a bridge between theory and reform in the hierarchical context.

8. EDUCATIONAL IMPLICATIONS

The theoretical exploration of teacher leadership as a distributed management in this article has profound implication to the educational leadership theory, conceptual reformation, and general organisational implications, and future theoretical extensions, especially in the light of the changing educational landscape in India through the National Education Policy (NEP) 2020 and its analogue within the global context.

The Contributions on education leadership theory focus on reinforcing post-heroic and practice-oriented views. Using the synthesis of distributed leadership as emergent and relational (Spillane, 2006), the current work goes beyond conceptualising individualistic and heroic models, to a way of conceptualising leadership as a distributed practice, spread in interactions, tools, and contexts. This strengthens post-heroic perspectives of interdependence rather than positional power (Harris, 2008), obstructing conventional hierarchies involving priority to principal-based control. In India, bureaucratic frameworks based on colonial legacies are still the most common, and, therefore, the contribution recommends a shift to relational, practice-based leadership, in accordance with the NEP 2020 focus on teacher empowerment and collaborative governance (Government of India, 2020). The findings are globally translated to parallel transformations in Western systems between transformational and distributed paradigms and therefore make the theory relevant to complex and diverse environments where situated enactment is preferable to a fixed role.

The **suggestions about conceptual change** provide avenues for redefining governance, professional growth, and policy with the distributed perspectives. Distributed management decentralises the decision-making process, hence permitting shared governance which weakens top-down silos and enhances structures that are inclusive (Spillane et al., 2004). In India, this would require reshaping the school governance through school management committees and teacher clusters under the NEP 2020 that would facilitate the autonomy and reduce administrative workload (Bhola and Dhanawade, 2024). The focus on professional development should be switched to collaborative, situated learning communities that would focus on the ongoing capacity-building of teachers as leaders (Wenner and Campbell, 2017). Distributed principles can be incorporated in policy reforms in order to focus on equity-based initiatives, including inclusive pedagogies and redistribution of resources, and overcome access and achievement disparities. Internationally, similar analogous reforms in the context of OECD reveal the potential of distributed approaches to promote policy responsiveness through the inclusion of stakeholder participation, because of which adaptive governance, due to the accelerated pace of change, can offer templates.

The **wider implication** is that it may prove to be a more democratic, responsive, and equitable educational organisation. Distributed teacher leadership has the effect of facilitating democratic participation through flattening hierarchies, where teachers co-construct practices and influence decisions, which results in cultures of trust and collective efficacy (York-Barr and Duke, 2004). This increases sensitivity to other needs, promoting equity through the empowerment of marginalised voices and alleviating inequities based on socioeconomic, cultural, or caste-based lines in India (Indian Express, 2020). This makes organisations adaptive, and therefore they can be able to respond to the modern set of challenges, including digital divides and inclusion by collaboratively innovating (Senge, 1990). The relevance of this importance is consistent all over the world, where the distributed models enhance the collective good and sustainability, which are part of the democratic educational ecosystems equipping learners with equitable societies.

Recommendations on theory expansion comprise a combination with significant lenses like social justice and postcolonial, or non-Western and heterogeneous environments. The inclusion of social justice paradigms can enhance the study of power redistribution and clarify how distributed leadership can help to reduce or extend inequities (Theoharis, 2007). India is one of the most relevant areas to consider in the context of postcolonial perspectives; colonial bureaucratic legacies determine hierarchies. Applying the theory to the practice of decolonisation may reveal epistemic justice mechanisms and cultural reclaiming (Khalifa et al., 2019). Applications to non-Western situations, such as rural or multilingual Indian contexts, might examine sustainability in resource-limited situations, and intersectional analyses of gender, caste and region would deepen sensibilities of distributed interactions. International comparisons across cultures with African or Latin American examples would help to emphasise adaptations between cultures, thus improving theory and making it more inclusive and equity-based.

These implications make the integrated model a vehicle of reformative change that balances theory and practice in the pursuit of equitable and democratic education in India and other parts of the world.

9. FUTURE DIRECTIONS

This theoretical analysis of teacher leadership in the distributed management provides several possibilities for future research to develop the concept of understanding the hierarchies in education in the Indian setting, and making comparisons with the situation in other parts of the world. Future trends must focus on longitudinal conceptual clarifications, interdisciplinary consolidations, and contextual usages to fill the onward gaps in theory and practice.

To explore the sustainability and development of distributed teacher leadership over time, first, longitudinal conceptual explorations are needed to investigate how distributed teacher leadership is developed and sustained. Although the existing structures are focusing on the emergent practices (Spillane, 2006), little theorisation is done on the survival of these arrangements in times of policy changes, change of leaders or pressure on the systems. In India, where the National Education Policy (NEP) 2020 has brought new ambitious reforms in teacher empowerment and decentralisation of governance, future work might follow conceptual lines

of distributed models of implementation, to evaluate how initial flattening of hierarchies adjusts to bureaucratic opposition or resource limits (Government of India, 2020). Internationally, longitudinal studies within such systems as in the United Kingdom or Australia might follow in the same footsteps and juxtapose how distributed leadership has been perpetuated in the wake of reform and informs the development of adaptive theory (Harris, 2014).

Second, integrations through interdisciplinary approaches that are critical have rich prospects in terms of enriching the framework. The theory of social justice leadership integration may clarify the role of a distributed arrangement that turns inequities based on caste, gender, region, and socioeconomic status (Theoharis, 2007). India is a country with educational hierarchies that can reflect the social division, and future theorising needs to consider decolonising aspects, exploring how postcolonial critique of the issue can be used to detect and suggest culturally relevant alternatives to epistemic justice (Khalifa et al., 2019). Similar examples of parallels in postcolonial and Indigenous leadership scholarship can be found globally, as in New Zealand or South Africa, where distributed models are reframed in the context of cultural sovereignty. Intersectional analyses might also consider the ways of intersection of multiple identities in distributed interactions that will enhance relational power understandings (Ball, 2013).

Third, it is not thoroughly theorised as applied to non-Western and diverse settings. Applicability of the Distributed Teacher Leadership Model to rural, multilingual, or low-resource Indian context might provide insights into special processes of interdependence and agency facing infrastructural complications. Future theoretical exploration can include exploring hybrid approaches to combine distributed principles and indigenous knowledge systems or community-based governance, especially in tribal or marginalised areas. International comparisons with other developing countries, including the sub-Saharan African or the Southeast Asian nations, may show the contextual adaptations, prove the transferability of the model, and note those factors that are universal and those unique to the culture (Tian et al., 2016).

Also, the discussion of overlaps with the emerging educational paradigm, including digital leadership or post-pandemic hybrid models, would bring theory into the world of modern complexities. In India, where NEP 2020 facilitates change by encouraging the use of technology, the future orientation may hypothesise the use of distributed teacher leadership in supporting equitable digital access and online communities. This is in line with current studies on technology-mediated distributed leadership in different environments across the world.

All these directions are set to narrow down and broaden the post-heroic, relational theory of leadership to make it pertinent to equitable and democratic educational change in India and elsewhere. By filling these gaps, future scholarship will be able to close the conceptual gaps, update the development of the policies, and add to more inclusive educational organisations.

10. CONCLUSION

This paper has conceptualised the role of teacher leadership in the distributed management as one avenue to redefine and de-hierarchise the conventional hierarchical systems in learning institutions. The main thesis is that traditional top-down bureaucracies, with their deep roots in

most systems such as the administrative structures that the Indian colonial rulers left behind, restrict the actions of teachers, their collaboration in workplace innovations, and their ability to respond to modern educational needs (Government of India, 2020). Using the distributed leadership theory (Spillane, 2006), which defines a leader as an emergent practice spread over people, situations, tools, and routines, the analysis frames the teacher leadership as a pivot element that puts the shared power of authority into practice, and questions the dominance of positions (York-Barr, 2017).

Distributed Teacher Leadership Model (DTLM) was synthesised to provide Hierarchy Flattening, incorporating these components into a dynamic, cyclical model. The most important factors are Teacher Leadership Enactment being the driving force, Distributed Management Arrangements being the facilitating context, Processes of Interdependence and Redistributed Power being the mediating processes, and Outcomes of Hierarchical Flattening as the reinforcing outcomes (Spillane et al., 2004; Vygotsky, 1978; Ball, 2013). In India, the model is well aligned with the vision of the National Education Policy (NEP) 2020 of empowered teachers, decentralised governance, and equitable reform that provides conceptual tools to break the vice of bureaucratic stagnation, administrative overload, and enduring inequities based on historical and societal divisions (Bhola & Dhanawade, 2024; Indian Express, 2020). The structure is also like Western and other systems across the world, where post-heroic relational models of leadership are also responding to complexity, diversity, and fast change (Harris, 2008; Gronn, 2002).

The change possibilities of teacher leadership inherent to distributed management are the ability to rethink the educational organisations as democratic, responsive, and equitable organisations. This distribution of leadership functions and the encouragement of located interactions, instead of dependency on single positional leaders, redistribution of power by negotiation and not by control, and, crucially, professional communities that can tackle complex problems, such as including and digitalising, regional inequalities, and post-pandemic recovery. Such transformation in the Indian context presents potential to achieve the goals of NEP 2020 of holistic, flexible, and inclusive education through raising the status of teachers as implementers to co-creators of practice. It is part of the wider forces of construction of adaptive systems around the world that focus on collective efficacy and social justice rather than managerial efficiency (Senge, 1990; Theoharis, 2007).

Theories of leadership are currently developing in terms of the demands of the modern educational conditions, and current trends are shifting towards practice-based, relationship-based approaches that are more likely to reflect networked, interdependent aspects of modern schooling. With the increasing diversity of educational settings, their technological mediated and policy-based nature, the theories need to be concerned with emergent dynamics, power flows, and contextual variations. This current contribution advances this development by connecting distributed leadership to teacher leadership in a way that explicitly addresses hierarchical persistence to provide a theoretically sound alternative that fits well in both resource-constrained and high-complexity environments.

Theories in the future ought to take several directions in order to narrow down and elaborate on these concepts. There is a need to conduct longitudinal conceptual inquiries to track the changes in distributed teacher leadership arrangements over time, especially the reaction to the policy implementation cycles and systemic pressure in India within the framework of NEP 2020. Critical analysis integrations, including social justice leadership, postcolonial theory, and intersectionality, can enhance the study of the redistribution of power, epistemic justice, and equity concerns in various cultural contexts (Khalifa et al., 2019). Additional elaborations to cover the recognised gaps, such as the mechanisms of sustainable power shifts and their use in non-Western, rural, or multilingual context will contribute to the explanatory power and transferability of the model. Comparative analysis with other developing and postcolonial settings can highlight both universal and context-specific aspects, which can sooner or later make post-heroic leadership theory more comprehensive and democratic in the future of education.

Overall, the redesign of hierarchies based on teacher leadership and distributed management is not only a theoretical step but also a conceptual base of transformational educational practice in India and elsewhere.

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DECLARATION OF INTEREST STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. This research was conducted independently, with no external funding or institutional bias, and reflects solely the academic perspectives of the authors.

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Mediating role of self-actualization in the relationship between light triad personality and healthy selfishness: Moderating effects of medium of instruction and teaching experience

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Abstract: Purpose: This paper analyzes the mediating effect of self-actualization on the relationship between light triad personality and healthy selfishness. It also examines whether the medium of instruction and teaching experience strengthen or weaken the relationship between the predictor variable (light triad personality) and the mediating variable (self-actualization).

Method: The Self-actualization Scale (Kaufman, 2018), the Light Triad Scale (Kaufman et al., 2019), and the Healthy Selfishness Scale (Kaufman & Jauk, 2020), with modifications for the research context, were administered to teacher trainees.

Findings: The analysis revealed a significant impact of light triad personality, medium of instruction, and teaching experience on self-actualization. Both light triad personality and self-actualization significantly influence healthy selfishness. Furthermore, self-actualization substantially mediates the relationship between light triad personality and healthy selfishness. Additionally, the medium of instruction also significantly moderates the relationship between light triad personality and self-actualization, highlighting its crucial role.

Practical Implications: The findings suggest that educators should help teacher trainees understand their personality type and how it influences self-actualization and healthy behaviors. Additionally, lessons should incorporate multilingual aspects to enhance teaching-learning experiences and support teacher trainees' self-actualization.

Keywords: *Healthy Selfishness, Light Triad Personality, Self-actualization.*

Introduction

Recent advances in personality psychology have foregrounded the Light Triad framework (Kaufman et al., 2019), which conceptualizes Kantianism, faith in humanity, and humanism as interrelated dimensions of prosocial personality. This marks a shift away from the traditionally studied Dark Triad, emphasizing traits that promote compassion, trust, and respect for others' intrinsic worth. In teacher education, nurturing these positive qualities is essential, as teacher trainees profoundly influence classroom environments and student well-being. Yet, the significance of these constructs for teacher trainees remains underexplored. Furthermore, healthy selfishness and self-actualization, key positive traits relevant to well-being and professional identity, have received limited empirical attention in educational contexts. This study seeks to fill these gaps by examining Light Triad traits, healthy selfishness, and self-actualization, advancing our understanding of how positive personality traits support teacher well-being and professional growth. While the philosophical roots of personality theory provide context, this research emphasizes contemporary evidence relevant to education.

The Light Triad framework, introduced by Kaufman et al. (2019), contrasts with the widely studied Dark Triad traits by shifting focus toward prosocial behaviors: an emphasis highly relevant in educational settings. Kantianism entails valuing individuals as ends in themselves, faith in humanity promotes trust in others' goodness, and humanism recognizes inherent worth. Empirical research demonstrates that Light Triad traits are inversely related to antisocial behaviors and are linked to healthy psychological functioning and positive interpersonal relationships (Kaufman et al., 2019).

Healthy selfishness (Kaufman & Jauk, 2020) refers to attending to one's needs and well-being without disregarding others: an adaptive quality distinct from self-centeredness. It promotes boundary-setting and self-care, essential skills for teachers. Research indicates that healthy selfishness is not associated with narcissism or unhealthy dominance but correlates positively with well-being, psychological flourishing, and self-actualization (Kaufman et al., 2020), supporting teacher resilience and sustained professional engagement.

Self-actualization, defined by Maslow (1943) and expanded by Kaufman (2018), involves realizing one's potential and pursuing meaningful goals. It is characterized by authenticity, purpose, and humanitarian values (Lewis et al., 2022), underpinning personal fulfillment and professional identity for teacher trainees. Kaufman's (2018) model outlines ten factors, including acceptance, equanimity, and creative spirit, that foster resilience and ethical decision-making. Empirical evidence links self-actualization to personal and professional well-being, underscoring its importance in teacher education (Ulfah et al., 2025; Kaufman, 2018).

Despite increased recognition of positive personality traits, a theoretical gap persists regarding the interplay among Light Triad traits, healthy selfishness, and self-actualization in shaping teacher trainees' well-being and professional identity. Teacher trainees are uniquely positioned to model prosocial values and resilience. Understanding these dynamics is essential for cultivating well-being, balanced professional practices, and supportive classroom environments. This study addresses these gaps by examining how positive personality traits prepare teacher trainees for their professional roles.

Accordingly, this research addresses the following questions.

Q1. Will self-actualization mediate the connection between the Light Triad personality and healthy selfishness among teacher trainees?

Q2. Does the medium of instruction and teaching experience moderate the strength or direction of the relationship between the Light Triad personality and self-actualization among teacher trainees?

To address the research questions, a moderated mediation analysis was conducted: self-actualization (SA) was tested as a mediator between the Light Triad personality (LTP) and healthy selfishness (HS), while the medium of instruction (MI) and teaching experience (TE) were examined as moderators in the LTP–SA relationship. The study draws on Kaufman et al.'s research on Light Triad personality (2019), healthy selfishness (2020), and self-actualization (2018), which provide empirical and theoretical foundations for these constructs.

This research advances the literature by testing self-actualization as a mediator between Light Triad personality and healthy selfishness, and by analyzing the moderating effects of the medium of instruction and teaching experience on the Light Triad–self-actualization relationship. While prior studies examined these constructs individually (Lukić & Živanović, 2021; Kaufman et al., 2019; Gerymski & Krok, 2019; Stavradi et al., 2022; Wills, 1974; Dahl et al., 1983; Kaufman, 2018; Troncoso, 1982; Clarke-Woolley, 1976), few explored their interconnections. Given the recent empirical introduction of healthy selfishness (Kaufman et al., 2020), a nuanced understanding of these interrelations offers significant theoretical and practical contributions.

The subsequent parts of the paper highlight the development of research hypotheses, the statistical model, the research methodology, data collection, measures, analysis, findings, discussion, and conclusion.

Literature Review

This section reviews the current literature underpinning the relationships between the Light Triad personality, self-actualization, healthy selfishness, and teacher development, with an emphasis on positive psychology in educational contexts. The review is organized into four subsections to provide a coherent synthesis and establish a strong theoretical foundation for the study's hypotheses.

1. Light Triad Personality in Psychological Research

The emergence of positive psychology has shifted scholarly attention from maladaptive personality characteristics to strengths-based traits that promote psychological flourishing and prosocial behaviour. Within this perspective, Kaufman et al. (2019) introduced the Light Triad personality as a positive counterpart to the Dark Triad. The construct comprises three dimensions: faith in humanity, humanism, and Kantianism. Individuals high in these characteristics tend to perceive others as inherently valuable, demonstrate empathy and compassion, and treat people as ends in themselves rather than as means to personal gain (Kaufman et al., 2019).

Empirical evidence suggests that the Light Triad is associated with greater life satisfaction, psychological well-being, interpersonal trust, and prosocial behaviour (Kaufman et al., 2019). These characteristics are particularly relevant in educational settings, where teachers are expected to establish supportive relationships, demonstrate ethical conduct, and foster positive learning environments. Teachers exhibiting Light Triad characteristics are often more

empathetic, tolerant, altruistic, sincere, and organized, which can lead to constructive interactions with students, enhanced teaching efficacy, and positive classroom climates (Orosova et al., 2026; Răducu & Stănculescu, 2022).

Beyond interpersonal outcomes, Light Triad traits are associated with higher self-esteem, authenticity, and a stronger sense of self, which are important for personal growth, self-development, and fully self-actualizing (Adam-Bagley et al., 2023; Kaufman et al., 2019). Despite its growing relevance, research examining the role of Light Triad personality in educational contexts remains limited, particularly among teachers and teacher trainees (Bălan et al., 2023).

2. Self-actualization in Educational Contexts

Self-actualization occupies a central position in Maslow's theory of human motivation and refers to the realization of one's fullest potential through personal growth, authenticity, autonomy, and meaningful engagement with life (Maslow, 1943). More recent conceptualizations view self-actualization as an ongoing developmental process characterized by self-awareness, intrinsic motivation, and the pursuit of personally meaningful goals (Kaufman, 2018).

Within educational settings, self-actualization has been linked to positive professional outcomes among teachers, including greater job satisfaction, autonomy, professionalism, and commitment to professional development (Pearson & Moomaw, 2005; Suyatno et al., 2022; Ulfah et al., 2025). Self-actualized teachers are more likely to engage in reflective practice, embrace lifelong learning, and create environments that support students' intellectual and emotional growth (Chua & Welch, 2021; Tian, 2025; Ulfah et al., 2025). These characteristics contribute not only to teaching effectiveness but also to teachers' psychological well-being (Kaufman, 2018; Shao, 2023).

Theoretical perspectives suggest that positive personality traits facilitate self-actualization by fostering intrinsic motivation and psychological growth (Jayawickreme & Blackie, 2014). Individuals who demonstrate empathy, authenticity, and concern for others are more likely to develop meaningful interpersonal relationships and pursue goals aligned with their values (Chen et al., 2024; Kono & Walker, 2020). Accordingly, Light Triad personality characteristics may provide the psychological foundation necessary for self-actualization (Kaufman et al., 2019). By encouraging personal growth, self-awareness, and authentic engagement with others, Light Triad traits may help teachers move toward realizing their professional and personal potential (Orosova et al., 2026).

3. Healthy Selfishness and Well-being

Healthy selfishness represents an adaptive form of self-interest that differs fundamentally from narcissism, egocentrism, or exploitative behaviour (Carlson et al., 2022; Kaufman & Jauk, 2020). Rather than prioritizing personal needs at the expense of others, healthy selfishness involves maintaining appropriate boundaries, engaging in self-care, and protecting one's psychological well-being while remaining considerate of others (Kaufman & Jauk, 2020; Soysal & Bakalim, 2023). Within positive psychology, healthy selfishness is increasingly recognized as an important contributor to psychological adjustment, resilience, and overall well-being (Kaufman & Jauk, 2020; Soysal & Bakalim, 2023).

For teachers, healthy selfishness is particularly important because educational professionals frequently encounter substantial emotional and professional demands. The ability to establish healthy boundaries, prioritize self-care, and maintain work-life balance can reduce burnout and promote long-term professional effectiveness (Brittain, 2025; Hogan & White, 2021). Consequently, healthy selfishness may enable teachers to meet both personal and professional responsibilities in a sustainable manner.

Self-actualization provides a theoretical basis for the development of healthy selfishness. Individuals who have achieved higher levels of self-actualization tend to possess greater self-awareness, autonomy, and psychological maturity (Robbins, 2021). These characteristics enable them to recognize their own needs, establish appropriate boundaries, and make decisions that promote both personal well-being and meaningful social relationships (O'Connor & Yballe, 2007). As a result, self-actualized individuals are more likely to engage in healthy selfishness. This suggests that self-actualization may function as an important psychological mechanism through which positive personality characteristics contribute to adaptive self-care and well-being.

4. Personality and Teacher Development

Teacher development is influenced by both individual and contextual factors. Personality characteristics play a crucial role in shaping teachers' professional growth, classroom effectiveness, and psychological well-being (Bardach et al., 2022). Previous research indicates that teachers who possess positive personality traits are more likely to demonstrate reflective practice, adaptability, resilience, and effective interpersonal relationships, all of which contribute to successful teaching outcomes (Heng & Chu, 2023). Similarly, self-actualized teachers tend to exhibit greater autonomy, professional commitment, and personal growth, which support both instructional effectiveness and career development.

Contextual factors may also influence how personality characteristics translate into developmental outcomes. Teaching experience, for example, contributes to professional competence, self-efficacy, and confidence (Rahmawati & Tusyanah, 2025). More experienced teachers may possess greater opportunities to apply and express positive personality characteristics within educational settings, thereby strengthening the relationship between personality and self-development. Conversely, less experienced teachers may still be developing the professional skills and confidence necessary to fully realize the benefits of positive personality traits.

Likewise, the medium of instruction may shape teachers' professional experiences and developmental opportunities (Wang et al., 2025). Different instructional contexts often involve distinct linguistic, cultural, and pedagogical demands, which may influence how teachers utilize their personal strengths and engage in professional growth (Nigat-Tulod, 2025). Consequently, the extent to which Light Triad personality contributes to self-actualization may vary across instructional contexts.

Although previous studies have independently examined positive personality traits, self-actualization, and teacher development, the influence of Light Triad personality on healthy selfishness through self-actualization remains an area with limited dedicated research. Furthermore, the role of contextual factors such as teaching experience and medium of instruction in shaping these relationships has received limited attention. Addressing these gaps

may enhance understanding of the psychological processes that support teacher well-being and professional development.

The following section synthesizes these streams to develop the study's hypotheses, clarifying the mechanism by which Light Triad personality may influence healthy selfishness through self-actualization, and how contextual factors moderate these relationships.

Hypotheses Development

Building on the literature, we propose a conceptual pathway linking Light Triad personality to healthy selfishness via self-actualization. First, Light Triad personality is hypothesized to foster self-actualization by promoting intrinsic motivation, ethical values, and personal growth (Adam-Bagley et al., 2023; Kaufman et al., 2019). Second, self-actualization is theorized to enhance autonomy, which, in turn, supports healthy boundary-setting and healthy selfishness, enabling teachers to engage in self-care without compromising professional commitments (Kaplan, 2022; Kaplan & Madjar, 2017). Thus, the hypothesized mechanism is: Light Triad personality → self-actualization → healthy selfishness.

Additionally, contextual factors such as teaching experience and medium of instruction may moderate these relationships, influencing the extent to which Light Triad traits and self-actualization manifest in teachers' healthy behaviors (Alqarni, 2021; Veeran et al., 2025).

Hypotheses

H1: Light Triad personality is positively associated with healthy selfishness through the mediating effect of self-actualization.

H2a: The relationship between Light Triad personality and self-actualization is moderated by the medium of instruction, such that the association is stronger when instructional language aligns with teachers' values and identity.

H2b: Teaching experience moderates the relationship between Light Triad personality and self-actualization, with experienced teachers demonstrating a stronger association due to greater professional maturity.

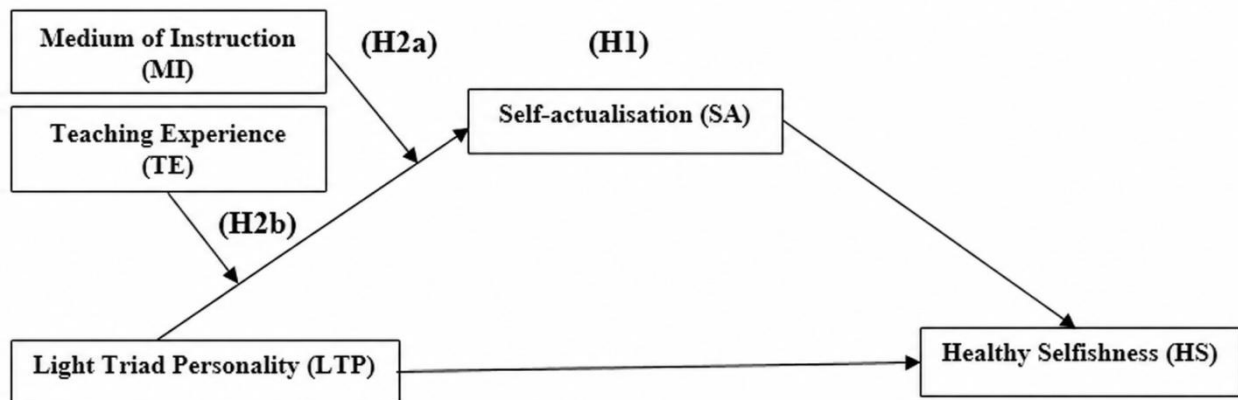
Statistical Model

Figure 1 illustrates the hypothesized moderated mediation model, which integrates both individual and contextual influences on the development of healthy selfishness among teacher trainees. In this framework, self-actualization mediates the relationship between Light Triad personality (LTP) and healthy selfishness (HS), in line with prior research highlighting the capacity of positive personality traits to facilitate self-actualizing tendencies (Kaufman, 2018; Maslow, 1987). Crucially, the model reconceptualizes the role of the medium of instruction (MI) as a moderator of the LTP–self-actualization link, drawing on sociocultural and linguistic relativity theories (Vygotsky, 1978; Boroditsky, 2011). Language is not merely a passive conduit for thought, but an active shaper of cognitive and emotional processes; thus, the language of instruction can influence the extent to which personality traits are expressed and actualized within educational contexts. Specifically, when the medium of instruction aligns with an individual's linguistic proficiency and cultural background, it may enhance their ability to authentically express personality traits such as empathy, compassion, and altruism, thereby facilitating self-actualization (Dewaele, 2015). Conversely, a misalignment may inhibit these expressions by imposing cognitive or affective barriers. By embedding the moderation mechanism in established linguistic and psychological theory, this model provides a

theoretically robust explanation for the role of language in the personality–self-actualization dynamic.

Figure 1

Moderated Mediation Model



Source: Created by Siddiqui (2026)

Method

Data Collection

This study used primary data collected through a purposive sampling technique. Bachelor of Education (B.Ed.) teacher trainees enrolled in regular two-year B.Ed. programs at institutions across Telangana state were targeted for participation. The list of institutions was sourced from the Telangana Council of Higher Education. After securing permission from the relevant authorities, a web-based survey was conducted across these institutions. Out of the invited trainees, 516 responded, yielding a high response rate of 99%. The online survey preserved participants' anonymity and addressed time and logistical constraints (Chang & Chen, 2008; Wang & Emurian, 2005). The instrument included three sections: instructions, confidentiality and informed consent, demographic information, and items pertaining to the study's variables. All participants provided informed consent prior to beginning the survey. Transparency was ensured throughout data collection by discussing and explaining the survey's purpose with the respective institutional authorities. Participation was entirely voluntary.

Measures

Light Triad Personality

The Light Triad Personality was measured using the Light Triad Scale (Kaufman et al., 2019). It has 12 items and three subscales: faith in humanity, humanism, and Kantianism, each comprising four items. The entire scale is positively scored, considering a 5-point Likert scale: "Always = 5", "Often = 4", "Sometimes = 3", "Rarely = 2", and "Never = 1".

Healthy Selfishness

Healthy Selfishness was assessed using the Healthy Selfishness Scale (Kaufman & Jauk, 2020). This scale consists of 20 items across two dimensions, one of which is Healthy Selfishness, comprising 10 items, scored on a 5-point Likert scale, ranging from "Always = 5", "Often = 4", "Sometimes = 3", "Rarely = 2", and "Never = 1".

Self-actualization

Finally, self-actualization was estimated using the 30-item Characteristics of Self-actualization Scale (Kaufman et al., 2018). This scale assesses ten characteristics of self-actualization:

continued freshness of appreciation, acceptance, authenticity, equanimity, purpose, efficient perception of reality, humanitarianism, peak experiences, good moral intuition, and creative spirit. It is scored on a five-point Likert scale: “Strongly Agree = 5”, “Agree = 4”, “Undecided = 3”, “Disagree = 2”, and “Strongly Disagree = 1”.

Data Analysis

First, the descriptive statistics of all three constructs were calculated. Second, the participants’ demographics were analyzed using the Statistical Package for Social Science (SPSS) 26v for Windows. Third, the Measurement Model was tested to analyze the tools’ psychometric properties. Lastly, the moderated mediation model was estimated using the Hayes PROCESS macro (Model 7).

Results

Descriptive Analysis

Table 1 presents the descriptive statistics of the constructs. The teacher trainees scores ranged from a minimum of 2.67 to a maximum of 5.00. The average score among them was 4.252, with a standard deviation of .402. For the light triad personality, scores ranged from 1.17 to 5.00. The mean score for the light triad personality among teacher trainees was 4.305, with a standard deviation of .537. Regarding healthy selfishness, the minimum score was 1.30, the maximum was 5.00, the mean was 4.197, and the standard deviation was .612. Notably, the consistently high means (all above 4) across variables suggest that participants tended to endorse positive self-perceptions, which may indicate a social desirability bias or a ceiling effect; such concentration of high scores can limit the interpretability of the results and raises questions about the extent to which these measures capture genuine psychological tendencies versus the influence of response biases. While some variability is reflected in the standard deviations, the clustering of scores near the upper end of the scale warrants caution when drawing strong conclusions about the psychological characteristics of the sample. The reported ranges show some diversity in responses; however, the elevated means and potential bias should be explicitly considered when interpreting the findings.

Table 1

Descriptive Analysis of the Model Variables

Variable	Minimum	Maximum	M	SD
SA	2.67	5.00	4.252	0.402
LTP	1.17	5.00	4.305	0.537
HS	1.30	5.00	4.197	0.612

Note. n = 516; SA: Self-actualization; LTP: Light Triad Personality; HS: Healthy Selfishness; M: Mean; SD: Standard Deviation

Demographic Analysis

Table 2 illustrates the demographic analysis of the participants. The study’s sample comprised 516 teacher trainees, exhibiting a heterogeneous demographic profile. The age distribution, ranging from 18 to 48 years (M = 26.75, SD = 5.72), suggested a cohort with varied life experiences. A pronounced gender disparity was evident, with females constituting a substantial majority (77.4%), reflecting potential trends in teacher training demographics. The sample demonstrated a balanced distribution across semesters, indicating a cross-sectional

representation of the training program. Regarding the medium of instruction, English predominated (61.6%), though the presence of Urdu-medium trainees (18.9%) highlighted linguistic diversity within the sample. Geographic concentration was evident, with nearly half of the participants residing in Hyderabad (47.3%), potentially reflecting the regional dominance of certain educational institutions. Urban residency was highly prevalent (86.1%), suggesting possible sampling bias or demographic differences in the trainee population. A substantial proportion of trainees (69.7%) had completed B.Ed. internships, indicating adherence to practical training requirements. University enrollment varied, with Osmania University representing the largest cohort (38.2%), potentially reflecting its regional prominence. Regarding teaching experience, a significant majority (59.3%) reported having less than 1 year of teaching experience, suggesting a novice group entering the teaching profession, with implications for pedagogical preparedness and professional development needs.

While the demographic spread appears diverse, several demographic skews, such as the overrepresentation of females, urban residents, and students from specific universities, may limit the generalizability of the findings. These factors, along with the geographic clustering, warrant consideration when interpreting the broader applicability of the results. It is important to recognize that such imbalances may reflect both the realities of teacher training in the region and potential sampling biases that could influence study outcomes.

Table 2

Demographic Profile of the Participants

Demographic Variables	N	%	Minimum	Maximum	M	SD
Age			18	48	26.75	5.72
Gender						
Female	400	77.4				
Male	117	22.6				
Semester						
I	105	20.3				
II	100	19.3				
III	155	29.9				
IV	157	30.3				
Medium of Instruction						
English	319	61.6				
Hindi	62	12				
Telugu	38	7.3				
Urdu	98	18.9				
District of the Institution						

Hyderabad	245	47.3
Jangoan	54	10.4
MedchalMalkajgiri	99	19.1
Nalgonda	16	3.1
Wanaparthi	56	10.8
Warangal-U	18	3.5
Others	29	5.6
Area of the Institution		
Rural	27	5.2
Suburb	44	8.5
Urban	446	86.1
B.Ed. Internship		
No	156	30.1
Yes	361	69.7
Affiliated University		
DBHPS	61	11.8
KU	81	15.6
MGU	16	3.1
MANUU	97	18.7
OU	198	38.2
PU	64	12.4
Teaching Experience		
< 1 Year	307	59.3
1-10 Years	198	38.2
>10 Years	12	2.3

Note. n = 516; M: Mean; SD: Standard Deviation; DBHPS: Dakshin Bharat Hindi Prachar Sabha; KU: Kakatiya University; MGU: Mahatma Gandhi University; MANUU: Maulana Azad National Urdu University; OU: Osmania University; PU: Palamuru University

Measurement Model

The measurement model was assessed to evaluate the quality of the study's constructs. The initial step involved testing factor loadings, followed by establishing construct validity and reliability.

Factor Loadings

Pett et al. (2003) defined factor loadings as the degree to which each item correlates with its principal component, ranging from -1.0 to +1.0. Items with higher absolute loadings indicate

stronger associations with underlying factors. Following Hair et al. (2016), items with loadings below .50 were excluded, resulting in 36 retained items out of 52. Table 3 presents the factor loadings of the retained items.

Table 3

Factor Loadings of Items

	CFA	Acpt	Auth	Equa	Purpose	EPR	Hum	PE	GMI	CS	FH	Humn	Kant	HS
CFA2	0.826													
CFA3	0.810													
Acpt5		0.794												
Acpt6		0.825												
Auth7			0.813											
Auth8			0.848											
Equa10				0.702										
Equa11				0.814										
Equa12				0.787										
Purpose13					0.786									
Purpose14					0.800									
Purpose15					0.817									
EPR16						0.779								
EPR17						0.802								
EPR18						0.767								
Hum19							0.756							
Hum20							0.776							
Hum21							0.793							
PE22								0.760						
PE23								0.738						
PE24								0.812						
GMI26									0.831					
GMI27									0.870					
CS28										0.77				
CS29										0.818				
CS30										0.805				
FH2											0.763			
FH3											0.820			
Humn5												0.734		
Humn6												0.786		
Humn7												0.835		
Kant9													0.786	
Kant11													0.812	
HS4														0.787
HS6														0.706
HS9														0.706

Note: CFA: Continuous Freshness of Appreciation; Acpt: Acceptance; Auth: Authenticity; Equa: Equanimity; EPR: Efficient Perception of Reality; Hum: Humanitarianism; PE: Peak Experiences; GMI: Good Moral Intuition; CS: Creative Spirit; FH: Faith in Humanity; Humn: Humanism; Kant: Kantianism; HS: Healthy Selfishness.

Indicators Multicollinearity

Indicator multicollinearity was assessed using variance inflation factors (VIFs) (Hair et al., 2021). Hair et al. (2016) recommended a VIF threshold of 4 or lower to indicate no significant multicollinearity. All study indicators met this criterion (see Table 4).

Table 4

Multicollinearity Statistics (VIF) for Indicators

	VIF
CFA2	1.128
CFA3	1.128
Acceptance5	1.108
Acceptance6	1.108
Authenticity7	1.171
Authenticity8	1.171
Equanimity10	1.222
Equanimity11	1.417
Equanimity12	1.287
Purpose13	1.398
Purpose14	1.431
Purpose15	1.418
EPR16	1.308
EPR17	1.368
EPR18	1.321
Humanitarianism19	1.271
Humanitarianism20	1.388
Humanitarianism21	1.286
PE22	1.263
PE23	1.256
PE24	1.354
GMI26	1.252
GMI27	1.252
CS28	1.373
CS29	1.494
CS30	1.368
FH2	1.070
FH3	1.070
Humanism5	1.267

Humanism6	1.365
Humanism7	1.510
Kantianism9	1.084
Kantianism11	1.084
HS4	1.193
HS6	1.163
HS9	1.162

Note. CFA: Continued Freshness of Appreciation; EPR: Efficient Perception of Reality; PE: Peak Experiences; GMI: Good Moral Intuition; CS: Creative Spirit; FH: Faith in Humanity; HS: Healthy Selfishness

Reliability Analysis

Reliability is the stability and consistency of a measurement instrument (Souza et al., 2018). Both Cronbach's alpha and composite reliability (CR) were used to assess construct reliability, as summarized in Table 5.

Composite reliability (CR) ranged from .771 to .843, surpassing the recommended .70 threshold (Hair et al., 2011). Cronbach's alpha ranged from .435 to .721, with some values below .70 (see Table 5). Despite some lower alpha values, the measurements are considered reliable for several reasons:

Alpha is a lower bound for reliability, so true reliability may be higher than reported (Guttman, 1945; Sijtsma & Pfadt, 2021; Cho & Kim, 2014).

Alpha can be negative if the average inter-item covariance is negative, but most reliability estimators, like SEM-based CR, are always non-negative. Alpha can also be less than 1 even without measurement error. Positively correlated item errors may inflate alpha, overestimating reliability (Lucke, 2005), and high alpha does not always reflect greater internal consistency (Cho & Kim, 2014).

Although internal consistency is often equated with homogeneity or unidimensionality among items (Cronbach, 1951), research has shown that alpha does not necessarily represent these qualities (Green et al., 1977; McDonald, 1981).

Increasing reliability by deleting items with low inter-item correlations can inflate alpha (Kopalle & Lehmann, 1997), but alpha does not always increase with more items, and item deletion may not genuinely improve reliability (Peterson, 1994).

Alpha thresholds of .70 or .80 are often used to judge reliability (Nunnally, 1994), but these cutoffs are not empirically derived (Taber, 2017). For exploratory research, thresholds of .50 or .60 are acceptable (Nunnally, 1967; Straub & Gefen, 2004). Artificially increasing alpha by deleting items can reduce criterion and content validity, causing the attenuation paradox (Humphreys, 1956; Loevinger, 1954).

High internal consistency may sometimes conflict with validity (Kline, 1986) and may reflect item redundancy rather than true scale quality (Boyle, 1991). Greater reliability is also needed when making finer distinctions (Cortina, 1993).

Coefficient alpha is not always suitable as a reliability measure (McDonald, 1981). To address its limitations, researchers use alternatives such as those in structural equation modeling (SEM). Composite Reliability (CR), a common SEM estimator, assesses the consistency of

items loading onto a latent variable and is often considered more robust than Cronbach's alpha, especially for multidimensional constructs.

SEM reliability estimators that do not require the assumptions of alpha are recommended (Cho & Kim, 2014). Thus, even though most Cronbach's alpha values were below .70, construct reliability is established because all CR values exceeded the recommended threshold (see Table 5).

Table 5

Construct Reliability Analysis (Cronbach's Alpha and Composite Reliability)

	Cronbach's Alpha	Composite Reliability
CFA	0.504	0.801
Acceptance	0.477	0.792
Authenticity	0.553	0.817
Equanimity	0.654	0.812
Purpose	0.721	0.843
EPR	0.684	0.826
Humanitarianism	0.670	0.819
PE	0.658	0.814
GMI	0.620	0.840
CS	0.715	0.840
FH	0.408	0.771
Humanism	0.689	0.829
Kantianism	0.435	0.779
HS	0.573	0.777

Note. CFA: Continued Freshness of Appreciation; EPR: Efficient Perception of Reality; PE: Peak Experiences; GMI: Good Moral Intuition; CS: Creative Spirit; FH: Faith in Humanity; HS: Healthy Selfishness

Construct Validity

Construct validity was assessed using PLS-SEM to evaluate convergent and discriminant validity.

Convergent Validity

Convergent validity refers to the agreement among multiple measures of the same construct (Bagozzi et al., 1991). It is established when items converge on the underlying construct, indicated by an average variance extracted (AVE) of .50 or higher (Fornell & Larcker, 1981). All constructs in this study exhibited AVE values above .50, confirming convergent validity (see Table 6).

Table 6

Constructs Convergent Validity (AVE)

Average Variance Extracted (AVE)

CFA	.669
Acceptance	.656
Authenticity	.691
Equanimity	.592
Purpose	.624
EPR	.613
Humanitarianism	.601
PE	.594
GMI	.724
CS	.637
FH	.628
Humanism	.618
Kantianism	.639
HS	.539

Note. CFA: Continued Freshness of Appreciation; EPR: Efficient Perception of Reality; PE: Peak Experiences; GMI: Good Moral Intuition; CS: Creative Spirit; FH: Faith in Humanity; HS: Healthy Selfishness

Discriminant Validity

Discriminant validity is the extent to which measures of different concepts are distinct (Bagozzi et al., 1991). This study used the Heterotrait-Monotrait Ratio (HTMT) and the Fornell-Larcker criterion to assess discriminant validity.

Fornell and Larcker Criterion

According to Fornell and Larcker (1981), discriminant validity is established when a construct's square root of AVE exceeds its correlations with other constructs (Abikari et al., 2022). This criterion was satisfied in the present study (see Table 7).

Table 7

Constructs Discriminant Validity—Fornell-Larcker Criterion

	Acpt	Auth	CFA	CS	EPR	Equa	FH	GMI	HS	Humn	Hum	Kant	PE	Purpose
Acpt	0.810													
Auth	0.415	0.831												
CFA	0.377	0.453	0.818											
CS	0.378	0.418	0.384	0.798										
EPR	0.358	0.432	0.400	0.498	0.783									
Equa	0.423	0.403	0.366	0.469	0.510	0.769								
FH	0.233	0.172	0.134	0.272	0.281	0.288	0.792							
GMI	0.396	0.252	0.230	0.417	0.439	0.425	0.264	0.851						
HS	0.246	0.224	0.204	0.336	0.338	0.281	0.382	0.224	0.734					
Humn	0.250	0.160	0.206	0.27	0.334	0.208	0.356	0.238	0.415	0.786				
Hum	0.392	0.456	0.410	0.52	0.538	0.411	0.307	0.398	0.298	0.356	0.775			
Kant	0.344	0.243	0.252	0.354	0.301	0.33	0.328	0.349	0.365	0.449	0.373	0.799		
PE	0.501	0.353	0.353	0.479	0.555	0.563	0.338	0.499	0.338	0.318	0.539	0.371	0.771	
Purpose	0.345	0.404	0.400	0.479	0.545	0.336	0.194	0.307	0.283	0.285	0.475	0.264	0.357	0.801

Note. Acpt: Acceptance; Auth: Authenticity; CFA: Continuous Freshness of Appreciation; CS: Creative Spirit; EPR: Efficient Perception of Reality; Equa: Equanimity; FH: Faith in Humanity; GMI: Good Moral Intuition; HS: Healthy Selfishness; Humn: Humanitarianism; Kant: Kantianism; PE: Peak Experiences. **Bold and italic** represent the square-root of AVE.

Heterotrait-Monotrait Ratio (HTMT)

The HTMT ratio estimates the correlation between constructs to assess discriminant validity. Literature suggests thresholds of .90 (Teo et al., 2008) and .85 (Kline, 2011). In this study, all HTMT ratios were below .90, supporting discriminant validity (see Table 8).

Table 8

Constructs Discriminant Validity—HTMT Ratio

	Acpt	Auth	CFA	CS	EPR	Equa	FH	GMI	HS	Humn	Hum	Kant	PE	Purpose
Acpt														
Auth	0.803													
CFA	0.774	0.857												
CS	0.649	0.665	0.645											
EPR	0.632	0.693	0.678	0.717										
Equa	0.761	0.662	0.63	0.679	0.758									
FH	0.519	0.354	0.292	0.496	0.528	0.569								
GMI	0.732	0.423	0.414	0.631	0.674	0.666	0.523							
HS	0.473	0.401	0.375	0.517	0.538	0.456	0.794	0.378						
Humn	0.44	0.257	0.346	0.382	0.483	0.305	0.672	0.363	0.653					
Hum	0.694	0.745	0.697	0.762	0.79	0.618	0.587	0.616	0.477	0.509				
Kant	0.756	0.49	0.54	0.636	0.556	0.606	0.776	0.668	0.727	0.816	0.688			
PE	0.899	0.578	0.608	0.697	0.821	0.862	0.658	0.78	0.55	0.468	0.807	0.693		
Purpose	0.59	0.637	0.665	0.669	0.774	0.478	0.352	0.459	0.441	0.403	0.671	0.472	0.512	

Note: Acpt: Acceptance; Auth: Authenticity; CFA: Continuous Freshness of Appreciation; CS: Creative Spirit; EPR: Efficient Perception of Reality; Equa: Equanimity; FH: Faith in Humanity; GMI: Good Moral Intuition; HS: Healthy Selfishness; Humn: Humanism; Hum: Humanitarianism; Kant: Kantianism; PE: Peak Experiences

Validating Higher Order Constructs (Reflective-formative)

The higher-order constructs of self-actualization and the light triad personality consist of 10 and 3 lower-order constructs, respectively. Validity was established by significant outer weights (Hair et al., 2014), outer loadings above 0.50 (Hair et al., 2019), and VIF values below 5 for all lower-order constructs (Hair et al., 2021). These results confirm the validity of the higher-order constructs (see Table 9).

Table 9

Higher Order Construct Validity

HOC	LOC	Outer Weights	t	p	Outer Loadings	VIF
SA	CFA	.103	5.359	0.000	.598	1.470
	Acceptance	.137	10.516	0.000	.653	1.573
	Authenticity	.105	7.481	0.000	.631	1.588
	Equanimity	.144	12.435	0.000	.710	1.760
	Purpose	.133	6.987	0.000	.662	1.673
	EPR	.162	14.821	0.000	.772	2.073
	Humanitarianism	.168	15.214	0.000	.754	1.879
	PE	.175	15.293	0.000	.772	2.119
	GMI	.136	12.332	0.000	.635	1.512
	CS	.161	12.148	0.000	.737	1.762

LTP	FH	.420	6.633	0.000	.722	1.193
	Humanism	.403	5.561	0.000	.770	1.334
	Kantianism	.482	6.581	0.000	.801	1.306

Note. HOC: Higher Order Constructs; LOC: Lower Order Constructs; SA: Self-actualization; LTP: Light Triad Personality; VIF: Variance Inflation Factor

The Goodness of Fit (Model's Predictive Capabilities)

Goodness-of-fit was evaluated using the predictive relevance measure (Q²), the effect size (F²), and the coefficient of determination (R²).

R-square (R²)

The R² values were 0.282 for both self-actualization and healthy selfishness, indicating that 28.2% of the variance in these constructs is explained by the predictors. This result suggests a strong association between light triad personality traits and self-actualization, as well as their combined influence on healthy selfishness.

Additionally, 28% of the variability in healthy selfishness was explained by the combined effect of light triad personality and self-actualization, indicating that a balanced approach to personal development within an ethical framework may promote healthy self-interest.

The model's R² values for self-actualization and healthy selfishness exceeded the 0.10 cutoff, indicating acceptable explanatory power (Falk & Miller, 1992).

F-square (F²)

F² effect size quantifies the impact of removing an independent variable on the dependent variable, with values of 0.35 (high), 0.15 (medium), and 0.02 (small) (Jacob, 1990). In this study, F² ranged from 0.162 (medium) for LTP on HS, 0.393 (high) for LTP on SA, to 0.037 (small) for SA on HS.

Q-square (Q²)

The Q² effect size for healthy selfishness was 0.248, indicating moderate predictive relevance (Hair et al., 2014). Table 10 summarizes the model fit results.

Table 10

Effect Size for Independent Variables

	R ²	SD	t	p
SA	.282	.048	5.817	0.000
HS	.282	.045	6.234	0.000
	F ²			
LTP→HS	.162	.049	3.309	.001
LTP→SA	.393	.097	4.032	.000
SA→HS	.037	.017	2.16	.031
	Q ²			
SA	.272			
HS	.248			

Note. SA: Self-actualization; HS: Healthy Selfishness, LTP: Light Triad Personality

Standard Root Mean Square Residual (SRMR)

In addition to the mentioned statistics, the standard root mean square residual (SRMR) can also be used to measure model fit. A value of less than 0.08 (Hu & Bentler, 1999) is considered a good fit. The present research SRMR value was 0.07, indicating a good model fit.

Hypotheses Testing

Testing for Mediation Effect

First, the results were examined to explore whether self-actualization mediates the relationship between the light triad personality and healthy selfishness (H1). The analysis indicates that the direct effect of the light triad personality (LTP) on healthy selfishness (HS), when accounting for self-actualization (SA), is statistically significant ($b = .593$, $t = 12.142$, $p < 0.001$). The indirect effect through self-actualization also reaches significance ($b = 0.0834$, $t = 2.9469$). These findings suggest that self-actualization may mediate the relationship between the light triad personality and healthy selfishness, providing empirical support for H1. The summary of H1 is presented in Table 11.

Testing for Moderated Mediation

It was hypothesized that the medium of instruction (H2a) and teaching experience (H2b) might moderate the relationship between the light triad personality and self-actualization. The results indicate that the light triad personality (LTP) is associated with self-actualization (SA) ($b = .407$, $t = 14.845$, $p < 0.001$), and that the medium of instruction also demonstrates a significant effect ($b = -.035$, $t = -2.819$, $p = 0.005$). Teaching experience yielded a statistically significant coefficient ($b = .073$, $t = 2.643$, $p = 0.008$), though its interpretive strength may be limited. Notably, the interaction between LTP and medium of instruction (LTP*MI) significantly predicted self-actualization ($b = -.069$, $t = -3.102$, $p = 0.002$), whereas the interaction between LTP and teaching experience (LTP*TE) was not significant ($b = .030$, $t = .574$, $p = 0.566$). The observed R-square change for LTP*MI suggests an incremental contribution to the model, while the change for LTP*TE does not reach significance. Collectively, these results lend support to H2a but not H2b, and should be interpreted in light of the complexity and limitations inherent in the moderating effects. Further details are provided in Tables 11 and 12.

However, the reported findings from the moderated mediation analyses should be interpreted in light of possible methodological constraints. While significant interaction effects were observed for the medium of instruction moderating the relationship between the Light Triad Personality and self-actualization, the lack of effect for teaching experience also merits careful consideration. The presence of significant effects does not necessarily indicate strong or practically meaningful moderation, especially given the earlier-noted issues of high means and possible ceiling effects. Moreover, the reliance on self-reported data, combined with sample characteristics, raises the possibility that some effects may be attenuated or inflated by response biases. Thus, while the statistical results support some hypotheses, claims regarding their substantive psychological impact should remain measured and acknowledge these interpretive caveats.

Table 11

Direct Relationships between Variables

Direct Relationships	Unstandardised Coefficient	t value
LTP → SA	.407	14.845
LTP → HS	.593	12.142

SA → HS	.204	3.118
LTP*MI → SA	-.069	-3.102
LTP*TE → SA	.030	.574

Note. LTP: Light Triad Personality; SA: Self-actualization; HS: Healthy Selfishness; MI: Medium of Instruction; TE: Teaching Experience

Table 12

Indirect Relationship between Variables

Indirect Relationship	Direct Effect	Indirect Effect (SE)	Confidence Interval Low/High	t value
LTP → SA → HS	.5931	.0834 (.0283)	.0298/.1425	2.9469
Probing Moderated Indirect Relationships (Index of Moderated Mediation)	Effect	SE	Confidence Interval Low/High	t value
MI – (LTP → SA → HS)	-.0143	.0073	-.0307/-.0024	-1.9589
TE – (LTP → SA → HS)	.0062	.0147	-.0216/.0384	.4217

Note. LTP: Light Triad Personality; SA: Self-actualization; HS: Healthy Selfishness; MI: Medium of Instruction; TE: Teaching Experience

Discussion:

The present research set out to explore two central questions: (Q1) whether self-actualization mediates the relationship between Light Triad personality and healthy selfishness among teacher trainees, and (Q2) whether the medium of instruction and teaching experience moderate this relationship. Based on these aims, we hypothesized that Light Triad personality would be positively associated with healthy selfishness, with self-actualization mediating this association (H1). We further posited that this relationship would be moderated by the medium of instruction (H2a), being stronger when instructional language aligns with teachers' values and identity, and by teaching experience (H2b), with more experienced teachers showing a stronger association due to greater professional maturity.

The findings revealed that Light Triad traits: humanism, Kantianism, and faith in humanity are not merely statistically associated with healthy selfishness, but that this relationship is primarily channeled through self-actualization. Rather than simply presenting numerical results, these outcomes encourage a broader, more interpretative understanding of positive personality as dynamic and context-dependent. Light Triad traits appear to serve as catalysts for self-actualization, equipping teacher trainees with crucial psychological resources to balance self-care and professional responsibilities. In this context, the mediating role of self-actualization highlights positive personality as generative: not only fostering personal well-being but also sustaining prosocial engagement in the demanding sphere of teaching. However, the persistence of a direct effect alongside partial mediation underscores the complexity of positive personality. Its influence on well-being and ethical self-interest is apparent, yet it may also be shaped by other contextual and dispositional factors that warrant further exploration.

Building on this, it is important to revisit the theoretical gap identified at the outset regarding the interplay among Light Triad traits, healthy selfishness, and self-actualization in shaping teacher trainees' well-being and professional identity. The present findings directly address this

gap by illuminating how these dimensions operate together to influence both personal and professional growth. Rather than viewing positive personality traits as fixed or solely statistically significant, the results suggest that cultivating such qualities has a dynamic, synergistic effect on teacher development. Identifying self-actualization as a mediating mechanism helps clarify how teacher trainees are uniquely positioned to model prosocial values, resilience, and balanced professional practices: qualities essential for fostering supportive classroom environments. This perspective invites a shift from traditional risk-and-deficit models to a more strengths-based approach in teacher preparation. When Light Triad traits are intentionally nurtured, teacher trainees appear better equipped to set boundaries, sustain their well-being, and fulfill their roles as both educators and role models. The practical implications for teacher education programs, therefore, include prioritizing personality development interventions that not only enhance teacher retention and classroom climate but also address the nuanced interplay of positive personality traits crucial for professional identity formation.

Besides this, the study's findings regarding the medium of instruction revealed the crucial role of language as a contextual moderator in the development of positive personality traits. The negative moderation effect suggests that when teacher trainees learn in a language that is misaligned with their linguistic or cultural identity, self-actualization is hindered, and the benefits of Light Triad traits are less fully realized. This insight advances both personality theory and teacher education research by highlighting the interplay between sociocultural context and psychological development. It underscores that the expression of positive personality is not merely an individual trait but is shaped by linguistic and cultural affordances. For teacher education, this means that attention to the medium of instruction is not a peripheral concern but a core component of nurturing teacher well-being and professional growth. Programs that support linguistic alignment or provide scaffolding for learners of a non-native language may better enable the actualization of positive personality traits, ultimately benefiting both prospective teachers and their future students.

Limitations and Future Directions

While this study offers valuable insights, several key limitations must be acknowledged. First, the cross-sectional design limits causal inference, as data were collected at a single point in time. Second, reliance on self-report measures introduces the possibility of response bias, as participants may portray themselves in a more favorable light. Relatedly, the use of a single survey instrument for all constructs raises concerns about common method variance, which could artificially inflate observed relationships. Third, the convenience sampling approach, particularly through a web-based survey, limits the generalizability of the findings beyond the current sample. Additionally, a ceiling effect observed in some Likert-scale responses suggests that participants tended to select higher ratings, thereby reducing variability and masking more nuanced differences. These methodological constraints collectively impact the robustness and generalizability of the study's conclusions.

Future research should address these limitations by adopting longitudinal or experimental designs to better establish causality, incorporating multi-method assessment strategies to mitigate self-report and common-method biases, and employing probabilistic sampling techniques to improve generalizability. Further, attention to scale construction and response

patterns can help minimize ceiling effects. Finally, as healthy selfishness and Light Triad traits remain relatively unexplored among teacher trainees, future studies would benefit from both quantitative and qualitative approaches to deepen understanding of these constructs.

Conclusion

To conclude, this study highlights the pivotal role of light triad personality traits and self-actualization in fostering healthy selfishness among teacher trainees. The results demonstrate that self-actualization significantly mediates the relationship between positive personality traits and adaptive self-care. Notably, the medium of instruction moderates this relationship, with alignment to trainees' linguistic and cultural backgrounds supporting greater self-actualization. While teaching experience offered some positive effects, its moderating role was less pronounced. These findings underscore the importance of cultivating positive personality traits and self-actualization in teacher education, as well as the need to consider contextual factors such as language of instruction. Collectively, this research provides valuable insights for designing interventions that enhance teacher well-being and professional growth, and it lays a foundation for future inquiry in this area.

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Conflict of Interest

The authors declare that there is no foreseeable conflict of interest regarding this manuscript.

Informed Consent Statement

The participants were well informed about the purpose of the survey. They voluntarily participated in the survey.

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Author Contributions Statement

HWS conducted the survey and drafted the manuscript. MS assisted in data analysis and reviewed the manuscript.

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Estimating student discontinuation in higher education: A methodological framework using institutional data from Indian universities

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Abstract: Student discontinuation remains a significant concern in higher education research and policy, particularly in contexts characterised by expanding enrolment and institutional diversification. However, existing studies often rely on inconsistent definitions and fragmented measurement approaches, limiting comparability across institutions. Although institutional datasets such as the National Institutional Ranking Framework provide standardised information on admissions and graduation outcomes, their potential for discontinuation analysis remains underutilised. In addition, institutional datasets often cannot distinguish between permanent dropout and institutional discontinuation, leading to conceptual and methodological ambiguity. The study proposes a methodological framework for estimating student discontinuation using institutional-level indicators. The framework introduces a standardised estimation model based on admitted student counts and graduation outcomes and outlines a replicable analytical workflow for institutional analysis. The applicability of the framework was illustrated using NIRF data from three selected central universities in India. The study contributes by clarifying the conceptual distinction between dropout and discontinuation, introducing a replicable estimation framework, and demonstrating how institutional ranking datasets may be repurposed for progression-oriented higher education research. The framework may support comparative institutional analysis, methodological standardisation, and exploratory policy assessment in contexts where longitudinal student-level tracking systems remain limited.

Keywords: *Academic Discontinuation; Higher education; Methodological framework; NIRF.*

1. Introduction

Student discontinuation has emerged as a persistent concern within higher education systems, particularly in contexts marked by expanding enrolment and increasing institutional diversity (Tinto, 1975; Yorke, 1999). Although access to higher education has widened in recent decades, a substantial proportion of students do not complete their programmes within the expected duration (Bean, 1980; Tinto, 1993). This pattern raises concerns not only about individual educational trajectories but also about the efficient use of institutional resources and the broader goals of equity and inclusion (Pascarella & Terenzini, 2005; Yorke, 1999). In this context, discontinuation may be viewed as an outcome reflecting the interaction among institutional conditions, student preparedness, and structural constraints (Bean, 1980; Cabrera et al., 1993; Tinto, 1993). However, despite its importance, discontinuity measurement remains an underdeveloped concept and method (Braxton, 2000; Yorke, 1999). This limitation constrains both scholarly analysis and policy intervention, thereby necessitating closer attention to how discontinuation is defined and operationalised (Braxton, 2000; Tinto, 1993).

Existing research on student attrition has generated valuable insights into the factors associated with non-completion. A considerable body of literature has examined individual-level determinants such as socio-economic background, academic preparedness, and motivation (Bean, 1980; Cabrera et al., 1993; Tinto, 1975). At the same time, institutional factors, including teaching quality, academic support, and campus environment, have also received attention (Braxton, 2000; Pascarella & Terenzini, 2005; Tinto, 1993). While these studies contribute to understanding the causes of student exit, they often rely on survey-based data or institution-specific datasets (Braxton, 2000; Cabrera et al., 1993). Such approaches, although informative, tend to yield findings that are difficult to compare across contexts because of variations in definitions, measurement strategies, and data availability (Braxton, 2000; Yorke, 1999). Moreover, the absence of a standardised operational framework for measuring student exit has led to conceptual ambiguity, particularly in the interchangeable use of terms such as 'dropout', 'attrition', and 'retention' (Tinto, 1975; Yorke, 1999). As a result, the existing literature appears fragmented, with limited cumulative progress in establishing comparable and scalable measurement approaches (Braxton, 2000).

Administrative and institutional datasets offer an alternative avenue for analysing patterns of student discontinuation at a larger scale (Pascarella & Terenzini, 2005). In the Indian context, initiatives such as the National Institutional Ranking Framework provide systematic data on institutional performance, including indicators related to student intake, graduation outcomes, and resource availability (Ministry of Education, 2025; Ministry of Education, n.d.). These datasets have been widely used for ranking and evaluation purposes; however, their potential for methodological analysis of student discontinuation remains underexplored (Ministry of Education, 2025). Given that such data are collected in a standardised format across institutions, they may support the development of comparable measures of student outcomes (Ministry of Education). Nevertheless, the absence of a clear methodological framework for interpreting these indicators in relation to discontinuation limits their analytical utility. In other words, while the data exist, the methods for transforming them into meaningful measures of student exit are not yet well articulated.

This gap points to a broader need for methodological clarity in the study of student discontinuation (Braxton, 2000; Tinto, 1993). Specifically, there is a need to distinguish between concepts that can be directly observed and those that are inferred. Institutional datasets typically capture enrolment and graduation patterns, but they do not track individual student trajectories across institutions (Ministry of Education, n.d.). Consequently, what can be observed is not necessarily permanent dropout from higher education, but rather discontinuation within a given institutional context (Tinto, 1975; Yorke, 1999). Recognising this distinction is important for developing appropriate measurement strategies (Braxton, 2000). Furthermore, a systematic approach is required to translate available institutional indicators into a consistent measure of discontinuity that can be applied across different settings. Such an approach would enhance comparability, support cumulative research, and provide a basis for evidence-informed policy analysis (Pascarella & Terenzini, 2005).

In response to these issues, the present study seeks to develop a methodological framework for measuring student discontinuation using institutional data. The study pursues three specific objectives. First, it aims to clarify the conceptual distinction between dropout and discontinuation in higher education research. Second, it proposes a standardised method for estimating discontinuation using commonly available institutional indicators, with particular reference to datasets such as the National Institutional Ranking Framework. Third, it demonstrates the applicability of the proposed method through a limited illustrative analysis of selected universities. By addressing both conceptual and methodological dimensions, the study seeks to contribute to the development of more coherent and replicable approaches to analysing student outcomes.

The study's contribution lies in three interrelated areas. It provides a conceptual clarification that distinguishes discontinuation from broader notions of dropout, thereby aligning measurement with observable data. It introduces a standardised and replicable methodological procedure for estimating discontinuation using institutional datasets. In addition, it demonstrates how existing large-scale data sources, typically used for ranking, can be repurposed for analytical research. Through these contributions, the study attempts to advance methodological discussion in higher education research while offering a practical tool for future empirical work.

The remainder of the paper is structured as follows. The next section presents a conceptual clarification of discontinuation in relation to dropout and related terms. This is followed by a critical review of existing approaches to measuring student attrition. The subsequent section outlines the proposed methodological framework, including its conceptual basis, estimation model, and analytical workflow. An illustrative application using selected universities is then presented to demonstrate the method's feasibility. The paper concludes with a methodological evaluation, implications for research and policy, and directions for future work.

2. Conceptual Clarification: Discontinuation and Dropout

Conceptual clarity is essential for any methodological contribution, particularly in areas where key terms are used inconsistently (Maxwell, 2012; Tinto, 1975). In higher education research, terms such as dropout, attrition, retention, and persistence are often used interchangeably, even though they refer to distinct phenomena (Bean, 1980; Braxton, 2000; Tinto, 1993). This lack of precision creates difficulties in measurement, comparison, and interpretation (Braxton,

2000; Yorke, 1999). Therefore, before proposing a methodological framework, it is necessary to clarify what is meant by student discontinuation and how it differs from related concepts, especially dropout.

The term dropout is commonly used to describe students who leave higher education without completing a programme (Spady, 1970; Tinto, 1975). In many studies, dropout is implicitly treated as a permanent exit from the education system (Bean, 1980; Tinto, 1993). This definition assumes that once a student leaves an institution, the individual does not re-enter higher education elsewhere. However, this assumption does not always hold, particularly in systems where student mobility across institutions and programmes is common (Hagedorn, 2005; Yorke, 1999). As a result, the use of dropout as an analytical category may obscure the distinction between temporary interruption, institutional transfer, and permanent withdrawal (Braxton, 2000; Tinto, 1993). This limitation becomes more pronounced when researchers rely on datasets that do not track individual student trajectories over time (Pascarella & Terenzini, 2005).

In contrast, the concept of discontinuation refers to the termination or interruption of enrolment within a specific institutional or programme context (Yorke, 1999). It captures the observable outcome that a student who was previously enrolled is no longer progressing academically within that institution. Importantly, discontinuation does not assume that the student has permanently exited higher education. Instead, it recognises that the student may have transferred to another institution, changed programmes, or temporarily suspended studies (Hagedorn, 2005; Tinto, 1993). In this sense, discontinuation is a more limited but empirically grounded concept, as it aligns with what institutional data can actually capture (Braxton, 2000). This distinction has important methodological implications (Maxwell, 2012). Institutional datasets, including those used for performance assessment and ranking, typically record aggregate information such as student intake, enrolment, and graduation outcomes (Ministry of Education, n.d.). However, they do not provide longitudinal tracking of individual students across institutions. Consequently, these datasets cannot reliably distinguish between permanent dropout and other forms of student movement (Pascarella & Terenzini, 2005). When such data are used to estimate dropout, there is a risk of misclassification, as students who transfer or temporarily discontinue may be counted as dropouts (Braxton, 2000; Hagedorn, 2005). Therefore, the use of the term dropout in such contexts may introduce conceptual and measurement errors (Maxwell, 2012).

Recognising these limitations, the present study adopts student discontinuation as the primary analytical concept. This choice reflects an attempt to align conceptual definitions with the nature of available data. By focusing on discontinuation, the analysis remains grounded in observable institutional outcomes rather than inferred individual trajectories (Maxwell, 2012). This approach does not deny the importance of studying dropout as a broader phenomenon; rather, it acknowledges that different types of data support different levels of inference (Pascarella & Terenzini, 2005). In contexts where individual-level longitudinal data are unavailable, discontinuation provides a more appropriate and defensible basis for measurement (Braxton, 2000).

At the same time, it is important to situate discontinuation within the broader framework of student progression. Discontinuation may be viewed as one component of a continuum that

includes enrolment, persistence, completion, and transition (Tinto, 1993; Yorke, 1999). From this perspective, discontinuation represents a deviation from expected progression within a given institutional setting. Its occurrence may be influenced by a range of factors, including academic challenges, financial constraints, institutional support, and personal circumstances (Bean, 1980; Cabrera et al., 1993; Tinto, 1993). While the present study does not attempt to model these determinants directly, it recognises that discontinuation reflects the interaction of multiple influences operating at different levels (Cabrera et al., 1993; Tinto, 1993).

Furthermore, the adoption of discontinuation as an analytical concept facilitates comparability across institutions. Since institutional datasets generally follow standard reporting formats, discontinuation can be estimated using consistent indicators such as intake and graduation outcomes (Ministry of Education, n.d.). This standardisation supports the development of comparable measures across diverse institutional contexts. However, it also requires careful interpretation, as the same measure may capture different underlying processes in different settings (Pascarella & Terenzini, 2005). For example, a high discontinuation rate in one institution may reflect student transfer to other institutions, while in another context it may indicate genuine attrition from higher education (Hagedorn, 2005). These nuances highlight the importance of combining methodological rigour with interpretive caution (Maxwell, 2012). In summary, the distinction between dropout and discontinuation is not merely semantic but has direct implications for measurement and analysis. While dropout refers to a broader and often unobservable phenomenon, discontinuation represents an institutionally bounded and empirically observable outcome. By adopting discontinuation as the central concept, the present study seeks to establish a more precise and methodologically consistent basis for analysing student exit. This conceptual clarification provides the foundation for the subsequent development of a standardised framework for measuring discontinuation using institutional data.

3. Review of Existing Measurement Approaches

The measurement of student exit from higher education has attracted considerable scholarly attention; however, the approaches adopted across studies remain varied and often inconsistent. This section reviews the methodological traditions used to analyse student attrition, with a focus on how discontinuation or dropout has been operationalised. The discussion highlights the strengths of existing approaches while identifying key limitations that justify the need for a more standardised methodological framework.

3.1 Survey-Based Approaches

Survey-based studies constitute a significant portion of the literature on student dropout (Bean, 1980; Cabrera et al., 1993; Tinto, 1993). These studies typically collect primary data from students through questionnaires or interviews, enabling researchers to examine individual-level factors such as socio-economic background, academic preparedness, motivation, and psychological well-being (Bean, 1980; Cabrera et al., 1993; Pascarella & Terenzini, 2005). One advantage of this approach lies in its ability to capture nuanced and context-specific information that is not available in administrative datasets (Creswell & Creswell, 2018). For instance, surveys may reveal students' subjective experiences of institutional support, perceived academic difficulty, or financial stress, all of which may influence decisions to discontinue (Tinto, 1993; Cabrera et al., 1993).

Despite these strengths, survey-based approaches exhibit several methodological limitations. First, such studies often rely on relatively small or institution-specific samples, which restricts the generalisability of findings (Creswell & Creswell, 2018; Pascarella & Terenzini, 2005). Second, the use of self-reported data introduces the possibility of recall bias and response bias, particularly when students are asked to reflect on past decisions (Podsakoff et al., 2003). Third, variations in survey design, measurement scales, and operational definitions make it difficult to compare results across studies (Braxton, 2000; Yorke, 1999). Consequently, while survey-based research contributes to understanding the determinants of discontinuation, it does not provide a consistent or scalable method for measuring the phenomenon across institutions (Braxton, 2000).

3.2 Administrative Data Approaches

Administrative data, collected by institutions or government agencies, offer an alternative means of analysing student outcomes (Pascarella & Terenzini, 2005). These datasets typically include information on enrolment, progression, and graduation, and may cover large populations over multiple years (Shavelson, 2010). As a result, administrative data support large-scale analysis and may enhance the external validity of findings (Pascarella & Terenzini, 2005). In many contexts, such data have been used to estimate retention rates, completion rates, and, indirectly, dropout patterns (Tinto, 1993; Yorke, 1999).

However, the use of administrative data also presents challenges. One major limitation concerns the lack of standardisation across institutions and datasets (Braxton, 2000). Different institutions may define and record variables such as enrolment status, programme completion, or student withdrawal in different ways. This variation complicates cross-institutional comparison (Yorke, 1999). In addition, administrative datasets often lack information on the reasons behind student exit, limiting their explanatory power (Pascarella & Terenzini, 2005). Importantly, most administrative data systems do not track students across institutions, which makes it difficult to distinguish between permanent dropout and institutional transfer (Hagedorn, 2005). As a result, estimates derived from such data may conflate different forms of student movement (Braxton, 2000; Hagedorn, 2005).

3.3 Institutional-Level Indicators and Aggregate Measures

A third approach involves the use of institutional-level indicators, often derived from publicly available reports or ranking frameworks. These indicators may include aggregate measures such as student intake, graduation outcomes, faculty–student ratios, and resource allocation (Ministry of Education, n.d.). Such data are typically standardised across institutions and are therefore suitable for comparative analysis (Ministry of Education, n.d.). In the Indian context, large-scale datasets such as those produced under the National Institutional Ranking Framework provide a structured compilation of institutional indicators across multiple dimensions (Ministry of Education, 2025).

While these datasets offer significant potential, their use in analysing student discontinuation remains limited. Most studies that engage with institutional indicators focus on performance evaluation or ranking rather than on student progression or exit (Ministry of Education, 2025). Moreover, there is no widely accepted methodological procedure for translating these indicators into measures of discontinuation. Researchers may use simple ratios or descriptive statistics, but these approaches are often ad hoc and lack theoretical justification (Braxton,

2000; Yorke, 1999). Consequently, although institutional datasets are rich in information, their analytical potential for studying discontinuation has not been fully realised.

3.4 Identified Gaps in Existing Approaches

The review of existing methods reveals several recurring limitations. First, there is an absence of a standardised operational definition of student exit, leading to inconsistent use of terms such as dropout and attrition (Braxton, 2000; Tinto, 1993; Yorke, 1999). Second, measurement approaches vary widely across studies, which undermines comparability and cumulative knowledge building (Braxton, 2000). Third, while large-scale institutional datasets are available, there is limited methodological guidance on how to use these data to estimate discontinuation in a consistent and theoretically grounded manner (Ministry of Education, 2025; Ministry of Education, n.d.). Finally, many approaches either focus on individual-level explanations without scalable measurement, or on aggregate data without sufficient conceptual clarity (Pascarella & Terenzini, 2005; Braxton, 2000).

Taken together, these gaps indicate the need for a methodological framework that can bridge conceptual and empirical dimensions. Such a framework should align definitions with observable data, provide a clear and replicable estimation procedure, and enable comparison across institutions. The following section addresses this need by proposing a structured approach to measuring student discontinuation using institutional data.

4. Proposed Methodological Framework

This section presents the central contribution of the study by developing a structured and replicable framework for estimating student discontinuation using institutional data. The framework is based on the principle that methodological validity depends on the alignment between **conceptual definitions, available data, and analytical procedures**. Accordingly, the proposed approach conceptualises discontinuation as an institutionally observable outcome derived from aggregate indicators such as student admissions and graduation outcomes. The section outlines the conceptual basis of the framework, introduces the estimation model, explains the analytical workflow, and discusses the analytical scope as well as possible sources of error and bias.

4.1 Conceptual Basis of the Framework

The proposed framework conceptualises student discontinuation as a deviation from expected academic progression within a given institutional setting. Under normal progression conditions, students admitted into a programme are expected to complete the programme within the stipulated academic duration. However, a proportion of students may not reach programme completion within this period. This divergence between admission and completion forms the basis for estimating discontinuation at the institutional level.

The framework rests on three interrelated assumptions. First, institutional datasets generally provide reasonably consistent information regarding student admissions and graduation outcomes. Second, the difference between admitted students and graduating students may function as a proxy indicator of discontinuation, provided that the assumptions and limitations of the data are acknowledged. Third, discontinuation is influenced by multiple institutional and structural conditions, including academic environment, student composition, financial constraints, and institutional support systems. While the present framework does not attempt

to model these determinants directly, it assumes that the estimated discontinuation indicator reflects the combined influence of such factors.

Importantly, the framework does not claim to identify permanent dropout from higher education. Instead, it seeks to estimate institution-level progression deviation using observable administrative indicators. Consequently, the resulting measure should be interpreted as an approximation of discontinuation rather than an exact measure of student attrition.

4.2 Estimation Model for Student Discontinuation

The methodological core of the framework is a standardised estimation model that uses institutional progression indicators to derive an estimated discontinuation measure. The model is represented as follows:

$$D_e = \frac{A - G}{A}$$

where:

D_e denotes the estimated discontinuation indicator,

A represents the number of students admitted into a programme or cohort, and

G indicates the number of students graduating within the minimum stipulated duration.

The logic of the model is based on the assumption that students who are admitted but do not appear among graduating students within the expected timeframe represent an approximation of discontinuation within the institutional context. The resulting value therefore estimates the proportion of students who do not complete the programme within the expected duration.

The framework intentionally uses *admitted student counts* rather than sanctioned intake capacity. This distinction is methodologically important because sanctioned intake reflects institutional capacity, whereas admitted students represent the actual participating cohort. In many institutional contexts, sanctioned seats may remain vacant, thereby distorting progression estimates if intake capacity alone is used. By grounding the estimation in actual admissions, the framework improves both validity and institutional comparability.

At the same time, the estimation model should be interpreted cautiously. The model does not distinguish between permanent withdrawal, institutional transfer, delayed completion, or temporary interruption of study. Consequently, the indicator reflects estimated discontinuation within a specific institutional context rather than definitive dropout from higher education.

4.3 Methodological Workflow

To ensure replicability, the framework proposes a systematic analytical workflow that researchers may apply using institutional datasets such as NIRF reports.

Step 1: Identification of Programme Category

The analysis begins by selecting a comparable programme category across institutions. Programme duration should remain consistent to reduce distortions arising from varying academic timelines. For example, two-year postgraduate programmes may provide greater comparability than combining undergraduate and postgraduate categories.

Step 2: Identification of Admission Data

The number of admitted students is identified from institutional reports. This value constitutes the reference cohort for the estimation process.

Step 3: Identification of Graduation Outcomes

The number of students graduating within the minimum stipulated duration is extracted from the same institutional dataset. Where possible, graduation data should correspond to the same academic cohort.

Step 4: Application of the Estimation Model

The estimated discontinuation indicator is calculated using the proposed formula. This produces a standardised institutional estimate that may support comparative analysis.

Step 5: Adjustment for Programme Duration

Where institutional reporting structures require approximation, researchers should align admissions and graduation data according to the normal duration of the programme. This adjustment is particularly important in datasets that do not explicitly track longitudinal cohorts.

Step 6: Contextual Interpretation

The resulting estimate should be interpreted in relation to institutional context, programme structure, and possible student mobility patterns. Comparative interpretation should therefore remain cautious and analytically grounded.

This workflow transforms raw institutional indicators into a replicable analytical measure while maintaining transparency regarding assumptions and limitations.

4.4 Analytical Scope and Applications

The proposed framework enables several forms of institutional analysis using publicly available administrative data. First, it facilitates cross-institutional comparison by generating a standardised progression-based indicator. Second, it supports the identification of broad patterns in student progression and completion across different institutional settings. Third, the framework may assist policymakers and institutional administrators in examining potential areas of progression loss without requiring complex student-level longitudinal datasets.

Another important feature of the framework is its adaptability. The model may be applied across different programme categories, institutional types, or temporal periods, depending on data availability and research objectives. This flexibility increases the potential applicability of the framework within higher education research and policy analysis.

At the same time, the framework is intended primarily as a methodological tool rather than a definitive evaluative instrument. The resulting indicator should therefore support exploratory and comparative analysis rather than deterministic institutional ranking.

4.5 Sources of Error and Bias

Although the proposed framework provides a systematic procedure for estimating discontinuation, the resulting indicator remains subject to several methodological limitations. One important limitation concerns the potential overestimation of discontinuation. Since institutional datasets do not track student mobility across institutions, students who transfer elsewhere may still appear as discontinued within the original institution.

Similarly, the framework may underestimate completion in contexts where students graduate after the minimum stipulated duration. Delayed completion, semester extension, academic interruption, or temporary withdrawal may reduce the number of students appearing in the expected graduation cycle even when eventual completion occurs.

Another source of limitation arises from cohort approximation. In many institutional datasets, admissions and graduation outcomes are reported annually rather than longitudinally. As a result, the alignment of admissions and graduation indicators involves assumptions regarding

programme duration and progression consistency. Variations in institutional reporting practices may therefore affect comparability across contexts.

In addition, institutional indicators themselves may contain inconsistencies arising from administrative reporting differences, evolving programme structures, or changes in admission patterns across years. These factors should be acknowledged when interpreting the estimated discontinuation indicator.

Rather than treating these limitations as methodological weaknesses alone, the framework considers them inherent constraints associated with aggregate institutional data. Explicit recognition of these constraints enhances methodological transparency and encourages cautious interpretation. Future research may refine the framework further through the integration of longitudinal or student-level tracking systems.

Overall, the proposed framework provides a conceptually aligned and methodologically replicable approach to estimating student discontinuation using institutional datasets. By combining conceptual clarification, a standardised estimation model, and a transparent analytical workflow, the framework attempts to address existing inconsistencies in higher education progression measurement while remaining attentive to the limitations of available data.

5. Illustrative Application Using Selected Universities

The proposed methodological framework was illustrated using institutional data obtained from the NIRF 2026 submissions of three central universities in India: University of Hyderabad, Maulana Azad National Urdu University, and English and Foreign Languages University. The purpose of this section is not to produce a comprehensive empirical analysis of discontinuation patterns, but rather to demonstrate how the proposed estimation framework may be applied using publicly available institutional indicators. Accordingly, the illustration is intended to show the operational feasibility of the method rather than generate generalisable conclusions.

5.1 Selection of Universities

The three universities were selected purposively to ensure institutional variation within a comparable higher education category. All three institutions are central universities and appear within the NIRF overall data reporting system; however, they differ in terms of institutional orientation, student composition, and academic profile. The University of Hyderabad represents a research-intensive multidisciplinary institution with relatively high national visibility. In contrast, Maulana Azad National Urdu University reflects a socially inclusive institutional model with a strong emphasis on access and linguistic diversity. The English and Foreign Languages University represents a specialised institution with a focused academic orientation towards language and humanities education.

The inclusion of these institutions serves two methodological purposes. First, institutional diversity allows the framework to be tested across different academic and organisational contexts. Second, the variation helps illustrate whether the estimation model is capable of identifying differences in student progression patterns without requiring individual-level tracking data.

5.2 Data Extraction and Variable Selection

For the illustrative application, the analysis was restricted to **Postgraduate (PG) Two-Year Programmes**. This restriction was adopted to maintain methodological consistency across

institutions. Since programme duration influences graduation timing, the use of a common programme structure reduces variation arising from differing academic timelines.

Two indicators were extracted from the NIRF 2026 institutional reports:

1. Number of students admitted in the first year of PG two-year programmes
2. Number of students graduating within the minimum stipulated time

The indicators were obtained from the “Placement and Higher Studies” section of the institutional submissions. For the present illustration, the academic year 2023–24 admission cohort and the corresponding graduation outcomes reported for 2024–25 were used.

Instead of using sanctioned intake capacity, the study employs *actual admitted students* as the reference value. This modification was adopted because sanctioned intake may not reflect actual student participation due to vacant seats. Consequently, the framework introduces a refined estimation indicator:

$$D_e = \frac{A - G}{A}$$

where:

D_e represents the estimated discontinuation indicator,

A denotes the number of admitted students, and

G refers to the number of students graduating within the minimum stipulated time.

This refinement improves methodological validity by linking discontinuation estimation to actual enrolment rather than institutional capacity.

5.3 Application of the Estimation Framework

Using the extracted indicators, the proposed estimation model was applied to the three selected universities. The resulting values are presented in Table 1.

Table 1

Illustrative Estimation of Student Discontinuation Indicators in Selected Universities

University	Admitted Students (A)	Graduating Students (G)	Estimated Discontinuation Indicator ((D _e))
University of Hyderabad	1335	1087	0.186
Maulana Azad National Urdu University	1107	1085	0.020
English and Foreign Languages University	433	306	0.293

Data source: NIRF 2026 institutional submissions.

The results indicate observable variation across institutions. The estimated discontinuation indicator appears comparatively low in the case of Maulana Azad National Urdu University, moderate for the University of Hyderabad, and relatively higher for the English and Foreign Languages University. Importantly, these values should not be interpreted as precise measures of dropout. Rather, they represent institution-level approximations of progression deviation derived from aggregate indicators.

5.4 Comparative Illustration and Methodological Interpretation

The illustrative application demonstrates several methodological features of the proposed framework. First, the estimation model is capable of producing differentiated institutional outcomes using only a limited set of publicly available indicators. This suggests that institutional datasets may support preliminary analysis of progression patterns even in the absence of longitudinal student tracking systems.

Second, the framework highlights the importance of contextual interpretation. For example, a relatively higher estimated discontinuation indicator in a specialised institution may not necessarily imply weaker institutional performance. The observed value may reflect programme mobility, delayed completion, or variations in student progression structures. Similarly, lower estimated discontinuation may arise from stronger completion systems, but it may also reflect differences in programme composition or reporting practices. Therefore, the framework is intended to support analytical approximation rather than deterministic classification.

Third, the illustration demonstrates the methodological advantage of using admitted students instead of sanctioned intake. In several institutional contexts, sanctioned capacity differs substantially from actual enrolment. By grounding the estimation in admitted student counts, the framework reduces distortions arising from unfilled seats and improves comparability across institutions.

Overall, the illustrative analysis confirms that institutional datasets such as NIRF reports may be repurposed for discontinuation estimation when supported by a clear conceptual and methodological structure. At the same time, the exercise also reveals the need for interpretive caution, particularly in relation to student mobility and cohort approximation. These considerations are examined further in the following section through a broader methodological evaluation of the proposed framework.

6. Methodological Evaluation

The proposed framework attempts to address a persistent methodological challenge in higher education research: the absence of a consistent and institutionally scalable approach for estimating student discontinuation. Rather than treating discontinuation as a directly observable phenomenon, the framework conceptualises it as an estimated progression deviation derived from institutional indicators. This section evaluates the methodological strengths, limitations, and analytical implications of the framework in light of the illustrative application presented earlier.

6.1 Methodological Strengths

One major strength of the framework lies in its conceptual alignment with available data. Existing studies frequently use the term dropout even when the underlying datasets cannot verify permanent withdrawal from higher education. In contrast, the present framework explicitly adopts discontinuation as the analytical category because institutional datasets primarily capture enrolment and completion patterns within specific institutional contexts. This conceptual clarification reduces ambiguity and improves methodological consistency.

A second strength concerns replicability. The framework relies on a limited set of indicators that are commonly available in institutional reports, particularly datasets produced through structured reporting systems such as NIRF. Since the estimation model requires only admission and graduation indicators, the procedure may be applied across multiple institutions without

extensive data collection. This feature enhances the potential for comparative analysis and cumulative research.

The framework also demonstrates analytical flexibility. Although the present illustration focused on postgraduate two-year programmes, the same methodological logic may be extended to other programme categories, institutional types, or temporal contexts, provided that comparable indicators are available. Such adaptability increases the utility of the framework for exploratory institutional analysis.

Another important contribution lies in the methodological refinement introduced through the use of admitted student counts rather than sanctioned intake capacity. In many institutions, sanctioned seats remain partially unfilled, thereby weakening the validity of intake-based progression estimates. By grounding the estimation in actual admissions, the framework improves the relationship between the observed cohort and the estimated discontinuation indicator.

Finally, the framework offers practical applicability for higher education research and institutional review. In contexts where longitudinal student-level tracking systems are unavailable or inaccessible, the proposed model provides a relatively simple method for approximating institutional progression outcomes using publicly available data.

6.2 Methodological Limitations

Despite its strengths, the framework remains subject to several limitations arising from the nature of aggregate institutional data. The most significant limitation concerns the inability to distinguish between different forms of student movement. Students who transfer to another institution, temporarily interrupt their studies, or change programme categories may appear as discontinued within the original institutional dataset even when they remain within higher education. Consequently, the estimated discontinuation indicator should not be interpreted as a definitive measure of permanent dropout.

Another limitation relates to delayed completion. The framework estimates progression deviation based on graduation within the minimum stipulated duration. However, students who complete programmes after extension or interruption periods may not appear in the expected graduation cycle. In such cases, the framework may overestimate discontinuation in institutions where delayed completion is relatively common.

The framework also depends on cohort approximation. Since institutional datasets often report admissions and graduations annually rather than longitudinally, the alignment between admitted students and graduating students involves assumptions regarding programme duration and progression continuity. Variations in curriculum structure, semester systems, or reporting practices may therefore affect the comparability of estimates across institutions.

In addition, institutional datasets themselves may contain reporting inconsistencies. Changes in programme structure, fluctuations in annual admissions, or differences in data interpretation across institutions may introduce measurement variation that is not directly related to actual progression patterns. These limitations highlight the importance of cautious interpretation and contextual analysis.

6.3 Sensitivity and Interpretive Considerations

The illustrative application demonstrates that the proposed estimation model is sensitive to institutional variation. However, such variation should not automatically be interpreted as

evidence of stronger or weaker institutional performance. Estimated discontinuation indicators may reflect multiple overlapping conditions, including programme composition, student mobility patterns, institutional selectivity, and differences in academic progression structures. This sensitivity reinforces the need for interpretive caution. The framework is intended to support methodological approximation rather than deterministic classification. Consequently, institutional comparisons should remain exploratory and contextually informed rather than evaluative in an absolute sense.

At the same time, the sensitivity of the model may be viewed as analytically useful. The ability to identify broad progression variation across institutions suggests that institutional datasets contain underutilised potential for higher education analysis beyond ranking exercises alone. In this regard, the framework demonstrates how publicly available administrative data may be repurposed for methodological and analytical research purposes.

6.4 Methodological Implications

The broader implication of the framework lies in its attempt to reposition institutional datasets as analytical resources rather than merely evaluative instruments. Large-scale reporting systems such as NIRF are generally designed for institutional assessment and ranking. However, the present study demonstrates that these datasets may also support exploratory methodological analysis when guided by a clear conceptual structure.

The framework further highlights the importance of aligning terminology with data capability. By distinguishing discontinuation from dropout, the study emphasises that methodological validity depends not only on statistical procedure but also on conceptual precision. This distinction may contribute to more careful operationalisation in future higher education research.

Finally, the framework suggests a possible direction for future methodological refinement. The integration of longitudinal student-level tracking systems, administrative linkage databases, or multi-institution progression records may substantially improve the precision of discontinuation estimation. Until such systems become widely available, institution-level estimation frameworks such as the one proposed here may provide a useful intermediate approach for comparative higher education analysis.

7. Implications for Research and Policy

The proposed framework carries several implications for higher education research, institutional analysis, and policy development. Although the framework is methodological in orientation, its application demonstrates how institutional datasets may support broader analytical understanding of student progression patterns when interpreted within a conceptually grounded structure.

7.1 Implications for Higher Education Research

One important implication of the study lies in the promotion of methodological standardisation within discontinuation research. Existing studies frequently employ different operational definitions, datasets, and measurement procedures, thereby limiting comparability across contexts. By proposing a transparent estimation model supported by a defined analytical workflow, the present framework contributes towards greater methodological consistency in institutional-level discontinuation analysis.

The framework also expands the analytical utility of institutional datasets. Publicly available administrative reports are often underutilised in higher education research because they are primarily viewed as evaluative or ranking instruments. However, the present study demonstrates that such datasets may support exploratory methodological analysis when guided by a clearly articulated conceptual structure. This opens possibilities for future comparative studies using institutional indicators across different institutional categories, regions, or time periods.

Another research implication concerns conceptual precision. The distinction drawn between discontinuation and dropout highlights the importance of aligning analytical terminology with the capabilities of available data. Future research may benefit from adopting more differentiated conceptual categories that recognise the limits of institution-level datasets while avoiding unsupported assumptions regarding permanent student withdrawal.

In addition, the framework may provide a foundation for more advanced methodological development. Researchers may extend the proposed model by incorporating longitudinal administrative systems, student mobility indicators, or multilevel analytical techniques. In this sense, the present framework may function as an intermediate methodological approach that bridges aggregate institutional reporting and more comprehensive student-level tracking systems.

7.2 Implications for Institutional Analysis

From an institutional perspective, the framework offers a relatively simple mechanism for examining progression patterns using existing administrative indicators. Institutions often monitor admission and graduation separately, but these indicators are not always integrated into a progression-oriented analytical structure. The proposed framework demonstrates how these data may be connected to generate preliminary estimates of discontinuation.

Such estimates may assist institutions in identifying broad areas of progression loss, particularly when examined over multiple years or across programme categories. While the framework should not be treated as a definitive evaluative instrument, it may support internal academic review, programme monitoring, and strategic planning processes.

The framework may also encourage greater attention to data consistency within institutional reporting systems. Since discontinuation estimation depends heavily on the alignment between admissions and graduation indicators, institutions may benefit from improving longitudinal reporting practices and progression tracking mechanisms.

7.3 Implications for Higher Education Policy

At the policy level, the framework highlights the potential value of institutional datasets for monitoring student progression within expanding higher education systems. In many national contexts, policy discussions surrounding access and equity increasingly emphasise not only enrolment expansion but also successful programme completion. However, reliable large-scale indicators of progression and discontinuation often remain limited.

The present framework suggests that structured institutional datasets such as those developed under the National Institutional Ranking Framework may provide a preliminary basis for progression-related analysis. Although such datasets were originally designed for institutional assessment, their analytical repurposing may support broader policy understanding of institutional variation in student progression outcomes.

At the same time, the study underscores the limitations of relying exclusively on aggregate institutional data. Effective policy analysis ultimately requires more robust longitudinal systems capable of tracking student trajectories across institutions and programme categories. Therefore, the framework should be viewed as a transitional methodological approach rather than a substitute for comprehensive student-level tracking infrastructures.

Overall, the proposed framework demonstrates that publicly available institutional indicators possess analytical potential beyond ranking and evaluation. By combining conceptual clarification with a replicable estimation procedure, the framework contributes to ongoing discussions regarding methodological innovation, institutional accountability, and progression analysis within higher education research and policy.

8. Conclusion

The present study addressed an important methodological gap in higher education research by proposing a structured framework for estimating student discontinuation using institutional datasets. Existing approaches to measuring student exit often suffer from conceptual inconsistency, fragmented operational definitions, and limited comparability across institutional contexts. In response, the study sought to develop a conceptually aligned and methodologically replicable approach that could utilise publicly available institutional indicators while remaining attentive to the limitations of aggregate administrative data.

A central contribution of the study lies in the distinction established between dropout and discontinuation. While dropout is frequently treated as permanent withdrawal from higher education, institutional datasets generally do not possess the capacity to verify such trajectories. Accordingly, the study argued that discontinuation represents a more appropriate analytical category when working with institution-level indicators. This conceptual clarification formed the basis for the development of the proposed estimation framework.

The study further introduced a standardised estimation model based on admitted student counts and graduation outcomes. By using actual admissions rather than sanctioned intake capacity, the framework sought to improve institutional comparability and reduce distortions caused by vacant seats. The accompanying analytical workflow demonstrated how institutional indicators can be systematically transformed into estimated discontinuation measures through a transparent, replicable procedure.

The illustrative application using selected central universities demonstrated the operational feasibility of the framework. Although the resulting estimates should not be interpreted as exact measures of student dropout, the analysis showed that institutional datasets, such as NIRF reports, have underutilised potential for progression-oriented research. At the same time, the study emphasised the need for interpretive caution due to limitations associated with student mobility, delayed completion, and cohort approximation.

Overall, the proposed framework contributes to methodological discussion in higher education research by repositioning institutional datasets as analytical resources rather than solely evaluative instruments. The framework offers a preliminary yet scalable approach for examining variation in progression across institutions in contexts where longitudinal student-level tracking systems remain limited.

Future research may extend the framework by incorporating longitudinal administrative databases, student mobility indicators, or programme-level progression tracking systems. Such

developments may improve the precision of discontinuation estimation and support more comprehensive analysis of student progression within higher education systems. Until such infrastructures become widely available, institution-level estimation approaches such as the one proposed in this study may provide a useful methodological foundation for comparative higher education analysis.

9. Limitations of the Study

The present study is subject to several limitations that should be considered while interpreting the proposed discontinuation framework. First, the framework relies on aggregate institutional data rather than longitudinal student-level records. Consequently, it cannot distinguish between permanent dropout, institutional transfer, temporary interruption, or programme change. Second, the estimation model is based on graduation within the minimum stipulated duration and may therefore overestimate discontinuation in cases of delayed completion. Third, the framework relies on cohort approximation because institutional datasets, such as NIRF reports, do not directly track individual student progression over time. Variations in institutional reporting practices may therefore affect comparability across institutions.

In addition, the illustrative application was limited to three selected central universities and focused solely on two-year postgraduate programmes. The findings should therefore be interpreted as methodological illustration rather than empirical generalisation. Finally, the proposed indicator was not validated against longitudinal retention or student-tracking datasets. Accordingly, the framework should be understood as an approximate institutional measure of progression deviation rather than a definitive estimate of student dropout. Despite these limitations, the framework may provide a useful methodological approach in contexts where comprehensive student-level tracking systems remain unavailable.

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Conflict of Interest

The authors declare that they have no conflict of interest.

Consent Statement:

Not applicable. This study does not involve human participants or data requiring consent.

Ethical Approval:

Not applicable.

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