

**RELATIONSHIP OF CLASSROOM CLIMATE AND
PARENTAL INVOLVEMENT WITH THE ACHIEVEMENT
OF SECONDARY SCHOOL STUDENTS IN ENGLISH:
MEDIATING ROLE OF THE PSYCHOLOGICAL CAPITAL
AND ENGAGEMENT**

Thesis Submitted for the Award of the Degree of
DOCTOR OF PHILOSOPHY
in
EDUCATION

By

Palash Majumder
(REGD.No-42000017)

Supervised By
Dr. Nimisha Beri
Professor and Head of Department,
Lovely Professional University,
Phagwara, Punjab, India



LOVELY PROFESSIONAL UNIVERSITY, PHAGWARA, PUNJAB

2026

DECLARATION

I, Palash Majumder, bearing Registration No.- 42000017, hereby declare that the research work embodied in the Ph.D. thesis titled " RELATIONSHIP OF CLASSROOM CLIMATE AND PARENTAL INVOLVEMENT WITH THE ACHIEVEMENT OF SECONDARY SCHOOL STUDENTS IN ENGLISH: MEDIATING ROLE OF THE PSYCHOLOGICAL CAPITAL AND ENGAGEMENT " submitted to the Lovely Professional University is the original and bonafide work carried out by me under the supervision of Dr. Nimisha Beri, Professor and Head of Department, School of Education, Lovely Professional University.

I further declare that:

- a)** The work presented in this thesis is a genuine contribution to the field of research and is a result of investigations carried out by me during the period of my doctoral study.
- b)** The research work has been conducted in accordance with the academic and ethical standards prescribed by the university.
- c)** Due acknowledgements and references have been duly given wherever the work of others has been cited or used.
- d)** The thesis has not been submitted either partly or fully to any other university or institution for the award of any degree or diploma.

I understand that any violation of the above declarations may lead to the cancellation of my degree by the university at any stage.

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Registration Number: 42000017

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CERTIFICATE

This is to certify that the work reported in the Ph.D. thesis entitled “RELATIONSHIP OF CLASSROOM CLIMATE AND PARENTAL INVOLVEMENT WITH THE ACHIEVEMENT OF SECONDARY SCHOOL STUDENTS IN ENGLISH: MEDIATING ROLE OF THE PSYCHOLOGICAL CAPITAL AND ENGAGEMENT” submitted in fulfillment of the requirement for the award of degree of **Doctor of Philosophy (Ph.D.)** in the School of Education, Lovely Professional University, is a research work carried out by Palash Majumder, Registration No.-42000017, is bonafide record of his/her original work carried out under my supervision and that no part of thesis has been submitted for any other degree, diploma or equivalent course.

Signature of Supervisor Name: Dr. Nimisha Beri UID: 16084 Date: 15-06-2026	N.A Signature of Co-supervisor (if applicable) Name UID(if applicable) Date

ABSTRACT

Proficiency in English has emerged as increasingly vital in today's interconnected global context; yet scholarly understanding of the multifaceted determinants shaping English achievement remains incomplete. Although prior investigations have documented various discrete predictors of language acquisition success, knowledge gaps persist regarding the interactive dynamics among contextual, familial, psychological, and behavioural variables in determining English proficiency outcomes. The present investigation addresses this lacuna by examining the interrelationships among Classroom Climate, Parental Involvement, Psychological Capital, learner involvement, and English achievement in secondary education settings, with specific attention to the intermediary functions of Psychological Capital and Student Engagement within these associations.

The conceptual foundation synthesized three complementary theoretical perspectives: Social Cognitive Theory elucidating contextual influences, Positive Psychology illuminating psychological assets, and Self-Determination Theory explicating behavioural participation and motivational processes. This integrative orientation proved essential for comprehending the diverse mechanisms whereby multiple variables shape English language learning results. The research posited that Classroom Climate and Parental Involvement would exhibit both unmediated effects on English achievement and mediated effects operating through Psychological Capital and learner involvement, constituting an intricate network of reciprocal influences on language acquisition success.

A cross-sectional correlational design was utilized to gather information from 1,605 Class XII students from government-sponsored secondary schools in the North 24 Parganas and Nadia districts of West Bengal. A stratified random sampling technique was employed, with stratification by both district and school locale (rural and urban), ensuring comprehensive representation of the focal population. The participant group exhibited optimal demographic distribution with 52.6% female and 47.4% male respondents, aged 16-17 years, affording substantial analytical capacity for sophisticated statistical procedures. Information was obtained through psychometrically validated measurement tools including a 20-item Classroom Climate instrument assessing supportive educational settings, a 15-item Parental Involvement measure evaluating household engagement in schooling, a 15-item Psychological Capital assessment examining aspirational thinking, capability beliefs, adaptive capacity, and positive expectancy, a 12-item Student Engagement instrument gauging behavioural, affective, and cognitive participation, alongside a standardized 30-item English Achievement Test. All

measurement instruments exhibited superior reliability characteristics with internal consistency coefficients surpassing .90. Comprehensive statistical analyses were conducted using Jamovi statistical software, including descriptive statistics, independent samples t-tests for group comparisons, Pearson correlation analysis, simple and multiple linear regression, path analysis using the Generalized Linear Model module, and bootstrap mediation analysis with 5,000 resamples using the jAMM module to evaluate both simple and parallel multiple mediation models examining intermediary effects among focal constructs.

Findings yielded robust empirical confirmation for the theoretical predictions, revealing the interconnected character of variables shaping English achievement. All bivariate associations among focal constructs attained statistical significance (r spanning .252 to .586, $p < .001$), validating the conceptual framework's soundness. Classroom Climate exhibited statistically significant positive effects on English achievement ($\beta = .092$, $p < .001$), whereas Parental Involvement displayed effects of $\beta = .104$, $p < .001$. Psychological Capital and Student Engagement emerged as the most potent predictors, with standardized coefficients of $\beta = .154$ and $\beta = .316$ respectively in the multiple regression model. All four theorized intermediary pathways received confirmation via bootstrap procedures with 5,000 resamples: Psychological Capital significantly mediated both Classroom Climate effects (indirect effect = 0.195, 95% CI [0.148, 0.247]) and Parental Involvement effects (indirect effect = 0.071, 95% CI [0.052, 0.092]) on English achievement, while Student Engagement demonstrated more pronounced mediation for both Classroom Climate (indirect effect = 0.342, 95% CI [0.286, 0.404]) and Parental Involvement (indirect effect = 0.110, 95% CI [0.089, 0.133]). Student Engagement surfaced as the most potent intermediary variable overall, functioning as the principal mechanism whereby contextual and familial variables shape language acquisition results. The comprehensive multiple regression model accounted for 38.1% of variance in English achievement, constituting a substantial effect per Cohen's benchmarks, with partial mediation verified for both primary antecedents, indicating that diverse pathways function concurrently. This investigation advances significant theoretical contributions by successfully synthesizing diverse theoretical orientations within English language pedagogy and furnishing compelling empirical documentation for intermediary processes in educational contexts. Results reveal that contextual and familial variables operate predominantly via psychological and behavioural pathways rather than through unmediated influence exclusively, extending comprehension of how external conditions transform into academic results. Applied implications encompass the imperative for holistic intervention strategies that concurrently address Student Engagement amplification, psychological resource cultivation, affirmative Classroom Climate

establishment, and substantive family participation rather than emphasizing isolated variables. Educational governance should acknowledge and facilitate multi-pathway approaches to English achievement, with resource distribution emphasizing learner-centered variables exhibiting the most robust intermediary effects. The research furnishes evidence-informed direction for practitioners, institutional leaders, and policy architects pursuing optimization of English language learning results through systematic consideration of interconnected variables. Subsequent investigations should scrutinize temporal relationships to determine causal ordering, probe cultural variability in mediation configurations, evaluate intervention initiatives targeting particular pathways, and investigate supplementary intermediary constructs to further enhance theoretical comprehension and applied implementations in English language pedagogy.

Keywords: classroom climate; parental involvement; psychological capital; student engagement; achievement in English; mediation analysis; path analysis; bootstrap mediation; English language education; secondary education; West Bengal

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“निमित्तमात्रं भव सव्यसाचिन्॥“

“Be merely an instrument, O Arjuna.”

— Bhagavad Gita, Chapter 11, Verse 33

This scholarly undertaking represents not a demonstration of personal capability, but rather a manifestation of divine providence that has illuminated my academic trajectory. With profound humility, I recognize myself as merely an instrument through whom this investigation has materialized.

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LIST OF ABBREVIATIONS

Abbreviation	Full Form
EAT	English Achievement Test
PPIS	Perceived Parental Involvement Scale
EFA	Exploratory Factor Analysis
CFA	Confirmatory Factor Analysis
CR	Composite Reliability
CCS	Classroom Climate Scale
PCAS	Psychological Capital Assessment Scale
SES	Student Engagement Scale
NEP	The National Education Policy
PTA	The National Parent Teacher Association
NEA	National Education Association
ESL	English as a Second Language
ASER	Annual Status of Education Report
WBSCERT	West Bengal State Council of Educational Research and Training
WBCHSE	West Bengal Council of Higher Secondary Education
OPI	Oral Proficiency Interview
PCA	Principal Component Analysis
MLE	Maximum Likelihood Estimation
CMIN	Chi-Square
RMSEA	Root Mean Square Error of Approximation
LSCE	Cognitive Engagement
SEE	Emotional Engagement
BEP	Persistence
CFI	Comparative Fit Index
TLI	Tucker-Lewis Index
SRMR	Standardized Root Mean Square Residual
VIF	Variance Inflation Factors
SD	Standard Deviation

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CHAPTER I: INTRODUCTION

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1.1 Introduction and Context of the Study

Globally, educational institutions function as cornerstones undergirding both societal progress and the cultivation of human potential. Schooling transcends mere knowledge transmission, serving to construct the moral and social foundations upon which civilizations rest. Within today's knowledge-driven economic landscape, pedagogical quality has crystallized as a pivotal indicator of a nation's developmental trajectory. The United Nations' fourth Sustainable Development Goal advocates for inclusive, equitable access to quality learning experiences across all populations. However, despite remarkable enrollment expansions across developing nations, persistent achievement disparities—particularly in language mastery—remain among education's most pressing challenges.

Within India's socioeconomic and pedagogical terrain, English assumes an exceptionally pivotal position. This language fulfills diverse roles: bridging international discourse, unlocking higher education access, and creating professional mobility pathways. India's 2020 National Education Policy designates English proficiency among core competencies required for twenty-first-century success. Nonetheless, large-scale national evaluations such as the 2021 National Achievement Survey and 2022 Annual Status of Education Report reveal ongoing learning deficits. Many students, especially within government-supported schools, demonstrate constrained abilities in reading comprehension and communicative expression, indicating that difficulties transcend curricular design to encompass wider sociocultural and psychological dimensions affecting language acquisition.

West Bengal offers an especially compelling setting for educational investigation. Notwithstanding the state's historical legacy of scholarly distinction and educational tradition, present-day instructional quality exhibits marked inconsistency across diverse school types. While student participation has increased substantially, recent assessment data expose considerable performance variation, with English language competence showing particularly stark disparities. Numerous contextual factors—encompassing socioeconomic inequality, linguistic diversity, teacher preparation standards, and limited home literacy support— influence learning outcomes. Furthermore, across many rural and semi-urban schools, English remains predominantly restricted to classroom instruction, receiving scant reinforcement within learners' everyday linguistic environments. Such limited language immersion constrains communicative skill development, negatively impacting both Achievement in English and students' self-efficacy beliefs.

Factors determining English language mastery extend considerably beyond inherent linguistic aptitude. Research evidence indicates that learning outcomes result from complex interplay among environmental conditions—notably Classroom Climate and Parental Involvement—alongside personal attributes including Psychological Capital and Student Engagement (Bandura, 2001; Fredricks et al., 2004; Luthans et al., 2007). Nurturing instructional environments foster motivational dispositions and participatory behaviors, while meaningful family engagement creates continuity linking home and school learning contexts. Simultaneously, internal psychological resources—comprising hope, self-efficacy, resilience, and optimism, collectively termed Psychological Capital—influence how learners navigate academic obstacles and maintain sustained educational involvement.

However, most current research investigating these constructs originates from Western or metropolitan urban contexts. Significant knowledge deficits remain concerning how these variables operate interactively within India's government-aided or vernacular-medium schools, where sociocultural and linguistic conditions diverge markedly from previously examined settings. The interrelationships connecting Classroom Climate, Parental Involvement, Psychological Capital, and Student Engagement—particularly their combined influence on Achievement in English—have received inadequate scholarly attention within West Bengal's unique pedagogical environment.

This study addresses these gaps by investigating how Classroom Climate and Parental Involvement influence Achievement in English via both direct effects and indirect pathways mediated through Psychological Capital and Student Engagement. The investigation employs a holistic framework, viewing language learning as a developmental process shaped by environmental support systems, individual psychological strengths, and active learner behaviors. This approach corresponds with the 2020 National Education Policy's emphases on joyful learning, holistic development, and integration of socioemotional capabilities into educational practice.

1.2 The West Bengal Educational Context

Historically, West Bengal has maintained a distinctive position within India's educational evolution. Spanning from the colonial era's liberal learning traditions through the state's enduring commitment to public education, schooling has functioned as a primary vehicle for social advancement. Recent years, however, have witnessed an expanding disconnect between educational access and instructional quality. While enrollment figures and infrastructure

development show laudable improvement, converting participation into substantive learning gains—especially regarding English language proficiency—remains problematic.

Data from the Unified District Information System for Education Plus (UDISE+ 2022-23) document near-universal secondary-level enrollment, with gender parity approaching 1.0. Nevertheless, comprehensive learning evaluations indicate that quantitative expansion has not generated corresponding qualitative improvements. The 2021 National Achievement Survey revealed West Bengal secondary students' mean English scores falling below national benchmarks, exhibiting pronounced urban-rural differentials. Socioeconomic stratification, insufficient qualified English educators, and limited out-of-school English exposure collectively impede effective language acquisition.

The 2022 Annual Status of Education Report (ASER) provides revealing data on students' English literacy capabilities, highlighting persistent foundational deficiencies even among adolescent learners. Table 1.1 displays the distribution of students aged 5-16 across various English reading proficiency levels.

Table 1.1 Percentage of Eighth-Grade Students (Age Group 5–16) in West Bengal and Their Reading Level in English

Indicators	Percentage of Students
Cannot read even capital letters	3.6 %
Can read capital letters only	4.4 %
Can read only small letters	25.1 %
Can read only simple words	26.2 %
Can read only easy sentences	40.7 %

1.3 Contemporary Challenges in Language Education

English language instruction in India navigates a complex terrain encompassing policy mandates, pedagogical actualities, and sociocultural dynamics. Although English has been designated as essential for global engagement, its instruction frequently encounters structural and methodological constraints. Scholars (Graddol, 2010; Crystal, 2012; Kirkpatrick, 2018) observe that English operates simultaneously as an empowering and stratifying instrument—empowering through facilitating access to international knowledge systems, yet stratifying by perpetuating social inequalities through differential exposure patterns.

Within West Bengal's government-supported and aided educational institutions, English instruction typically commences at primary levels, though pedagogical quality and instructional consistency vary considerably. Numerous educators possess constrained communicative proficiency or depend extensively on grammar-translation pedagogies, fostering mechanical acquisition rather than authentic language engagement. Classroom observational research (NCERT, 2021; Mukherjee & Das, 2022) reveals that comprehension skills and oral interaction receive insufficient emphasis relative to textbook coverage. Overcrowded classrooms and diverse linguistic backgrounds further limit personalized instructional feedback, consequently undermining students' confidence and participatory behaviors.

A continuing challenge involves the home-school discontinuity. Learners from non-English-speaking families seldom experience home-based reinforcement of school instruction. While parents value English education, many lack linguistic capabilities to furnish academic assistance. Accordingly, students rely predominantly on scholastic contexts for language acquisition. Absence of literacy-rich home environments, restricted peer communication opportunities, and socioeconomic stressors intensify disengagement, yielding superficial or memorization-based learning.

Beyond instructional considerations, psychological dimensions including diminished self-efficacy, performance apprehension, and constrained resilience influence sustained second-language learning efforts. Positive psychology scholarship (Luthans et al., 2007; Dewaele & MacIntyre, 2014) indicates that affective states—hope, optimism, and persistence—prove critical for maintaining engagement and accomplishment. Nevertheless, empirical investigations connecting such psychological constructs with Classroom Climate and familial contexts within Indian settings remain limited.

Additionally, globalization and digital transformation have elevated expectations for communicative English proficiency, yet technology integration within government schools remains modest. Digital access disparities, combined with infrastructure inconsistencies, constrain blended or interactive learning possibilities. These contextual circumstances emphasize that English acquisition challenges are multidimensional, encompassing pedagogical, psychological, and socioeconomic factors.

Consequently, this investigation addresses a pressing requirement to examine how classroom climate and parental involvement interact with learners' psychological capital and engagement to shape achievement outcomes. Comprehensive understanding of these interconnections will assist educators and policymakers in formulating targeted interventions to enhance English

proficiency among West Bengal's secondary students.

The next section elaborates on the **rationale, need, and significance** of undertaking this investigation within the contemporary educational landscape of West Bengal.

1.4 Rationale, Need of the Study

The ongoing disparity between pedagogical goals and actual English learning outcomes among West Bengal's secondary students necessitates fresh investigation into achievement determinants. Although the state has largely succeeded in ensuring universal educational access, instructional quality and learning efficacy persist as primary challenges. Reports from the National Achievement Survey (NAS, 2021) and ASER (2022) document that substantial student populations experience difficulty with grade-appropriate comprehension activities despite eight years of formal instruction. These findings prompt a fundamental question: why do students exposed to the same curriculum and instructional resources perform so differently?

1.4.1 Rationale

This study's rationale emerges from three interconnected imperatives: the contextual urgency of addressing English underperformance within government-supported schools, the conceptual deficit in comprehending how environmental and psychological variables interact, and the methodological necessity for an integrated framework capturing these multifaceted processes.

First, English continues to function as a '*gate keeping subject*' in the Indian educational and employment hierarchy. In West Bengal, limited proficiency constrains students' access to higher education and professional opportunities. Second, while past research has examined discrete influences such as teaching methods or socio-economic background, few studies have explored '**how classroom climate and parental involvement jointly operate**' through students' psychological and engagement-related mechanisms. Third, a rigorous structural model that empirically validates these interconnections is largely absent from the Indian school context.

By situating this investigation within the framework of **Social Cognitive Theory** and **Positive Psychology**, the study extends current understanding from static descriptions to dynamic explanations of learning behaviour. It recognizes that language achievement is not determined by exposure alone but by the interplay of supportive environments, internal resources, and sustained engagement.

The selection of the four core variables—Classroom Climate, Parental Involvement, Psychological Capital, and Student Engagement—emerged from a systematic triangulation of theoretical frameworks, empirical evidence, and contextual relevance. Classroom Climate was selected because the instructional environment constitutes the most immediate and pervasive influence on learners' daily academic experiences; decades of research within Social Cognitive Theory (Bandura, 1986, 2001) and ecological frameworks (Bronfenbrenner, 1979) have consistently demonstrated that the quality of the classroom environment shapes motivational orientations, self-regulatory behaviours, and ultimately academic performance. Parental Involvement was incorporated because the home environment represents the primary microsystem within which children's educational dispositions are formed; within West Bengal's socio-cultural context, where a substantial proportion of families comprise first-generation educated members, the nature and quality of parental engagement with children's schooling critically determines whether adolescents perceive English language mastery as an attainable goal or an insurmountable challenge. Psychological Capital was identified as a theoretically grounded mediating variable because the HERO framework (Hope, Efficacy, Resilience, Optimism) encapsulates the internal psychological resources that enable learners to persist through the inherent difficulties of second-language acquisition; empirical evidence from educational psychology (Luthans et al., 2007; Youssef-Morgan & Luthans, 2014) consistently demonstrates that students with elevated PsyCap demonstrate greater academic persistence and achievement. Student Engagement was selected as the second mediating variable because contemporary scholarship conceptualises it simultaneously as an outcome of supportive environments and as a proximal determinant of achievement; its three-dimensional structure—cognitive, emotional, and behavioural—captures the full spectrum of learners' investment in the learning process. Collectively, these four variables were identified as forming a theoretically coherent, empirically supported, and contextually relevant explanatory system for understanding Achievement in English among secondary school students in West Bengal.

1.4.2 Need for the Study

Considering the 2020 National Education Policy and Sustainable Development Goal 4's emphasis on inclusive, equitable educational quality, this investigation responds to the critical imperative of identifying malleable variables capable of elevating English acquisition standards across diverse socioeconomic strata. Numerous government-supported institutions in West Bengal's semi-urban and rural regions encounter obstacles including classroom overcrowding, insufficient educator preparation in English as a Second Language instruction,

and constrained family literacy assistance.

Investigating Classroom Climate and Parental Involvement furnishes actionable intervention points requiring minimal infrastructure expenditure. Correspondingly, strengthening Psychological Capital and Student Engagement can foster intrinsic learner empowerment, cultivating resilience and motivational orientations independent of external reinforcements. Accordingly, this study addresses both policy imperatives and ground-level actualities, connecting macro-level quality emphases with micro-level achievement determinants.

1.5 Significance of the Study

This investigation's significance manifests across three dimensions:

- 1) **Theoretical Contribution** – Through synthesizing environmental (instructional and familial) and psychological (Psychological Capital and Student Engagement) domains within an integrated framework, this research advances theory development in educational psychology. It contextualizes constructs originating in Western scholarship within Indian secondary education's socio-cultural context, thereby enriching cross-cultural framework validation.
- 2) **Empirical Contribution** – Employing large-scale quantitative analysis and structural equation modeling, this study furnishes empirically validated relationship patterns among variables, elucidating both direct and indirect pathways influencing Achievement in English. Such evidence can inform subsequent comparative and intervention-focused investigations.
- 3) **Applied Contribution** – For educational practitioners and policy architects, findings can shape educator preparation curricula, family engagement initiatives, and instructional practices designed to foster supportive learning contexts. Through identifying Psychological Capital and Student Engagement as mediating mechanisms, the study indicates that academic outcomes may improve within current resource parameters if psychosocial processes receive systematic attention.

This investigation aims to establish conceptual and empirical foundations for formulating comprehensive interventions enhancing English language acquisition through integrated attention to instructional environments, family participation, and learner psychological processes.

1.6 Statement of the Problem

‘Relationship of Classroom Climate And Parental Involvement With The Achievement

Of Secondary School Students In English: Mediating Role of The Psychological Capital And Engagement’.

1.7 Operational Definitions

To ensure the utmost clarity, precision, and replicability of this research, the operational definitions of all key terms employed throughout this study are meticulously delineated. These definitions serve as the foundational bedrock, specifying with rigorous detail how abstract theoretical constructs are translated into measurable and observable variables within the distinct context of this investigation. By providing a clear framework for the assessment of these variables, these definitions underpin the validity and reliability of the entire research endeavor. Each operational definition presented herein has been firmly rooted in established theoretical frameworks, yet thoughtfully adapted to resonate with the specific nuances of English language learning among secondary school students in West Bengal, India. This dual approach ensures both academic rigor and contextual relevance, facilitating a comprehensive understanding of the study's scope and methodology. The subsequent sections will detail each operational definition, along with its measurement instrument and theoretical underpinnings, ensuring that every aspect of the research is transparent and scientifically sound.

Parental Involvement

"The involvement of parents in the various facets of their children's lives, specifically in the areas of academics, relationships, discipline, decision-making, provision of facilities, technology usage, and interest development"

The PARENTAL Involvement operationalizes the seven dimensions specified in the above definition, enabling systematic measurement of students' perceptions regarding their parents' educational engagement.

For the purposes of this investigation, Parental Involvement is operationally assessed using the refined 15-item Perceived Parental Involvement Scale (PPIS), validated for the present sample (Cronbach's $\alpha = .87$; CFI = .95), with the composite score representing the student's perceived level of parental academic engagement.

Classroom Climate

Classroom Climate is conceptualized in this investigation as students' subjective evaluations of their instructional setting's characteristics.

Dimensions:

1. Physical dimension: "a physically welcoming and conducive environment"

2.Social dimension: "a socially interactive environment"

3.Emotional dimension: "an emotionally supportive environment that enhances self-esteem and belongingness"

4.Intellectual dimension: "an intellectually stimulating environment that encourages learning and self-fulfillment"

Respondents indicate their perceptions using a five-point Likert-type rating scale.

In the present study, Classroom Climate is operationally measured through the refined 20-item Classroom Climate Scale (CCS), which demonstrated strong psychometric properties (Cronbach's $\alpha = .89$; CFI = .96; RMSEA = .05), yielding a composite score that served as the primary indicator of the classroom environmental quality experienced by each participant.

Achievement in English

For this investigation, Achievement in English represents students' demonstrated proficiency as measured by their scores on a standardized English Achievement Test (EAT) specifically constructed for this research.

Dimensions:

(1) Reading Comprehension - ability to understand and interpret written texts

(2) Vocabulary - breadth and depth of word knowledge

(3) Grammar - command of syntactic and morphological structures

Each correct response receives one point, yielding a total possible score range of 0-30, with higher scores indicating greater English language proficiency.

In the present study, Achievement in English is operationally measured by the researcher-constructed, validated 30-item English Achievement Test (EAT), which demonstrated satisfactory reliability (Cronbach's $\alpha = .84$) and content validity as verified by subject experts; the total correct score (range: 0–30) constitutes the operational measure of English language proficiency.

Psychological Capital

"An individual's positive psychological state of development", characterized by four core components namely Hope, Efficacy, Resilience and Optimism.

Dimensions:

1.Hope – “goal-directed energy and pathways thinking”

2.Efficacy – “confidence in one's abilities to succeed”

3.Resilience – “capacity to bounce back from adversity”

4.Optimism – “positive attributional style regarding future events”

Participants respond to PCAS items using a five-point Likert-type format ranging from strongly disagree to strongly agree.

In this study, Psychological Capital is operationally quantified through the refined 15-item Psychological Capital Assessment Scale (PCAS), which demonstrated acceptable reliability and construct validity (Cronbach's $\alpha = .86$; CFI = .94), with the total composite score serving as the operational indicator of each student's psychological resource capacity.

Engagement

"A psychological process reflecting a student's interest, investment, and effort in the learning process"

Dimensions:

- 1.Cognitive Engagement – “strategic approaches and self-regulation in learning”
- 2.Emotional Engagement – “affective reactions and sense of belonging”
- 3.Behavioral Engagement – “participation and effort in academic activities”

The SES employs a five-point Likert-type response format enabling students to indicate their level of agreement with each statement.

For this investigation, Student Engagement is operationally measured using the refined 12-item Student Engagement Scale (SES), validated for the present sample (Cronbach's $\alpha = .85$; CFI = .95), with the composite score representing the student's overall level of academic engagement across cognitive, emotional, and behavioral dimensions.

Secondary School Students

Secondary School Students refer to male and female students studying in Grades XI and XII in Government-sponsored secondary schools affiliated with the West Bengal Council of Higher Secondary Education (WBCHSE). For this study, only students from Class XII are included in the sample.

In the present study, the term "secondary school students" refers to students enrolled in Class XII in government-sponsored and government-aided schools in West Bengal. This usage is consistent with the NEP 2020 Secondary Stage framework (Classes IX–XII). It is acknowledged that under the conventional West Bengal educational structure, Class XII students are formally designated as "higher secondary" students. The present terminological choice reflects the NEP 2020 framework adopted by the affiliating university and does not alter the empirical scope or substantive findings of the study.

1.8 Theoretical and Conceptual Basis

The conceptual orientation of the study integrated perspectives from **Social Cognitive Theory**, **Positive Psychology**, and **Engagement Theory**, each offering complementary explanations for how environmental and personal factors interact to influence learning outcomes.

1.8.1 Social Cognitive Theory (SCT)

Bandura's theoretical work (1986, 2001) conceptualized learning as emerging from triadic reciprocity, wherein individual characteristics, behavioral patterns, and contextual elements continuously influence one another. This framework positioned the instructional environment as a critical social context shaping learners' academic expectations, motivational orientations, and behavioral responses. When teacher-student relationships are characterized by warmth and peer interactions provide support, students develop stronger beliefs in their capabilities, resulting in sustained involvement in learning activities. In contrast, classroom atmospheres marked by intimidation, apathy, or authoritarian control tend to suppress active participation and diminish academic performance. Thus, SCT offered theoretical grounding for understanding how environmental conditions interact with students' internal psychological and emotional processes.

1.8.2 Family Systems and Parental Involvement

Building upon Bronfenbrenner's ecological model (1979), the familial unit represented the primary microsystem wherein children's developmental pathways emerge. Family educational engagement—encompassing supervision, motivational encouragement, and home-based academic support—functions as a critical external influence shaping learners' educational orientations. Epstein's (2011) framework delineates three principal dimensions: home-school communication, domestic learning activities, and participation in educational decision-making. Empirical evidence demonstrates that parental academic expectations and home literacy practices directly influence students' achievement motivation while concurrently enhancing their classroom learning involvement. Within West Bengal's educational context, where many families comprise first-generation educated members, Parental Involvement's nature and quality substantially determined whether adolescents perceive English language mastery as an attainable objective or an overwhelming obstacle.

1.8.3 Positive Psychology and Psychological Capital (PsyCap)

The 'Psychological Capital construct' emerged from 'positive organizational psychology'

scholarship and has subsequently found application in educational research (Luthans et al., 2007; Youssef-Morgan & Luthans, 2014). This multifaceted construct synthesized four core components—‘goal-oriented thinking (hope), capability confidence (self-efficacy), adaptive resilience, and positive future expectations (optimism)’—that collectively enhance learners' capacity for sustained academic pursuit despite encountering obstacles. Within educational contexts, adolescents demonstrating elevated Psychological Capital display enhanced persistence, adaptability, and emotional regulation, translating into intensified learning engagement and improved achievement outcomes. Within this investigation's framework, Psychological Capital constitutes an internal psychological mechanism whereby contextual variables including Classroom Climate and Parental Involvement influenced Achievement in English.

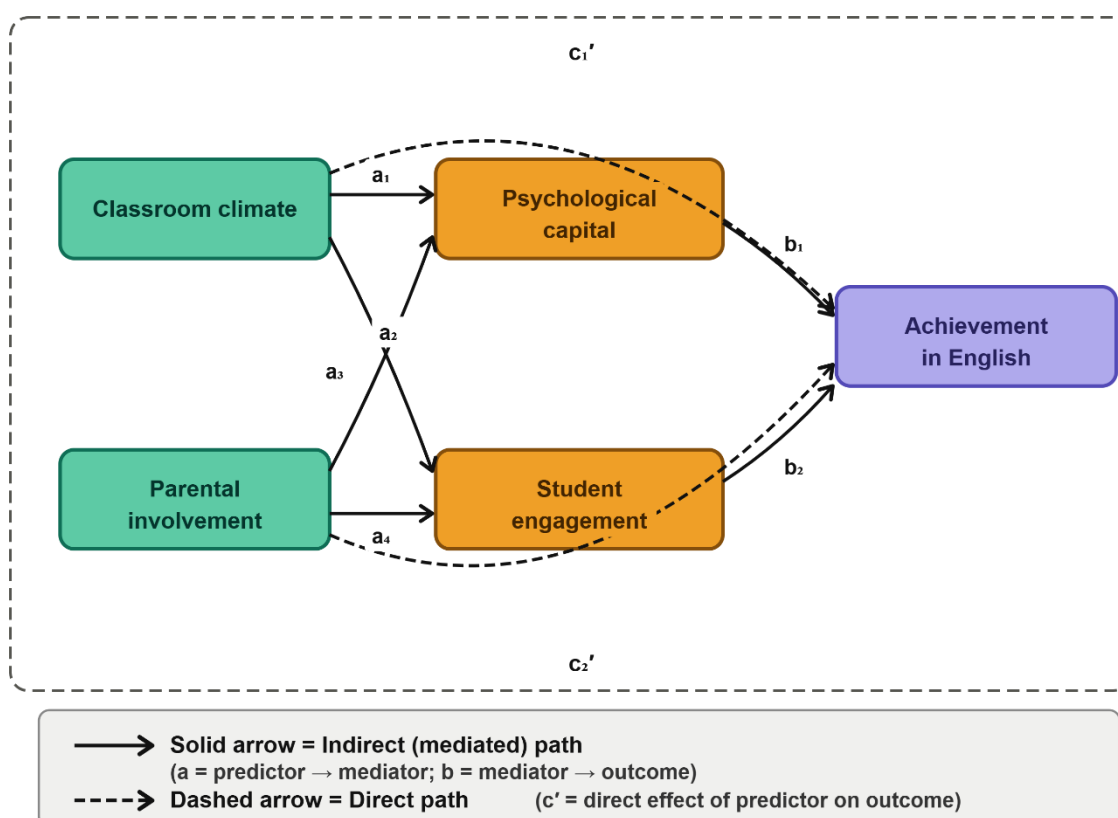
1.8.4 Student Engagement Theory

‘Student Engagement encompasses diverse modalities through which learners invest themselves in educational experiences, spanning behavioral, affective, and cognitive dimensions’ (Fredricks, Blumenfeld, & Paris, 2004). ‘The behavioral facet reflects active curricular and co-curricular participation; the affective component captures students' connectedness, enthusiasm, and positive educational orientations; whereas the cognitive dimension represents intentional, metacognitive learning strategies.’ Contemporary scholarship conceptualizes Student Engagement simultaneously as both an outcome of supportive educational environments and a precursor to academic achievement. Therefore, it operates as a mediating pathway linking Classroom Climate and Parental Involvement influences with Achievement in English outcomes.

1.8.5 Integrative Conceptual Framework

By weaving together these theoretical perspectives, the study proposed an integrative model wherein **Classroom Climate** and **Parental Involvement** function as *environmental antecedents* that influence **Achievement in English** directly and indirectly through the *personal mediators*—**Psychological Capital** and **Student Engagement**.

Figure 1.1. Conceptual Framework for the Current Study.



This proposed framework advanced the following theoretical propositions:

- 1) Supportive Classroom Climate and elevated Parental Involvement levels associate with superior Achievement in English among secondary students.
- 2) Psychological Capital mediates associations between environmental variables (Classroom Climate and Parental Involvement) and Achievement in English.
- 3) Student Engagement mediates interconnections among environmental variables, Psychological Capital, and Achievement in English.
- 4) These relationship magnitudes may demonstrate variation across demographic attributes including gender and school location.

From a **research perspective**, this framework advocates simultaneous examination of multiple predictors and mediators rather than isolated variables. From a **practical perspective**, it underscores the need for interventions that cultivate positive classroom climates, strengthen home-school partnerships, and build learners' psychological resources and engagement. The framework also acknowledged that these relationships are dynamic, subject to contextual influences, and responsive to pedagogical innovations.

1.9 Objectives of the Study

This investigation addressed critical knowledge deficits concerning complex interrelationships among environmental variables, psychological resources, behavioral involvement, and Achievement in English among West Bengal's secondary students. Grounded in extensive theoretical foundations and empirical evidence from existing scholarship, this research sought to furnish comprehensive insights informing both theoretical comprehension and applied interventions in English language pedagogy.

The study's principal objectives systematically examined multiple relationship dimensions, advancing from descriptive analyses toward complex mediational modeling capable of revealing underlying mechanisms whereby Classroom Climate and Parental Involvement shape Achievement in English outcomes.

Research Objectives

1. To explore type of classroom climate and level of parental involvement, psychological capital, engagement among secondary students.
2. To find differences in perceived classroom climate and level of parental involvement, psychological capital, engagement, and achievement in English among the secondary students on the basis of gender and locale of school.
3. To find the interrelationship of classroom climate, parental involvement, psychological capital, engagement and achievement in English among secondary students.
4. To explore the mediating role of Psychological Capital on the relationship between Parental involvement and English achievement of the secondary students.
5. To explore the mediating role of Engagement on the relationship between the Parental involvement and English achievement of the secondary students.
6. To explore the mediating role of Psychological Capital on the relationship between classroom climate and English achievement of the secondary students.
7. To explore the mediating role of engagement on the relationship between classroom climate and English achievement of the secondary students.

1.10 Research Hypotheses

These study's research hypotheses derived from comprehensive theoretical frameworks and empirical evidence spanning educational psychology, positive psychology, and language acquisition scholarship. These hypotheses articulate testable predictions regarding associations among Classroom Climate, Parental Involvement, Psychological Capital, Student Engagement, and Achievement in English among West Bengal's secondary students. Each hypothesis builds

upon established theoretical principles and prior empirical findings while addressing contextual factors specific to English language acquisition within India's educational system.

These hypotheses examined both direct variable relationships and complex mediational pathways potentially explaining how environmental factors influence student outcomes via psychological and behavioral mechanisms. This comprehensive approach enabled testing multiple theoretical predictions while yielding practical insights for educational intervention and policy formulation.

Hypotheses of the present study are:

1. There exists significant difference in perceived classroom climate and level of parental involvement, psychological capital, engagement and academic achievement among secondary school students on the basis of gender and locale of school.
2. There exists significant relationship between classroom climate and psychological capital and engagement among secondary school students.
3. There exists significant relationship between parental involvement and psychological capital and engagement among secondary school students.
4. There exists significant relationship of classroom climate, parental involvement, psychological capital and engagement to academic achievement among secondary school students.
5. Psychological Capital mediates relationship between Parental involvement and English academic achievement of the secondary school students
6. Academic Engagement mediates relationship between the Parental involvement and English achievement of the secondary school students.
7. Psychological Capital mediates relationship between classroom climate and English achievement of the secondary school students.
8. Academic engagement mediates relationship between classroom climate and English achievement of the secondary school students.

1.11 Delimitations of the Study

Every empirical investigation is necessarily bounded by certain parameters that define its scope and ensure manageability without compromising validity. The present study was delimited as follows:

- 1) **Geographical Scope** – The study was confined to **secondary schools in West Bengal**, India, with data collected primarily from government-sponsored and aided institutions located across selected districts representing both urban and rural contexts. Consequently, the findings may not be generalized to private or central-board schools.
- 2) **Population Parameters** – The target population comprised Class XII students under West Bengal Council of Higher Secondary Education (WBCHSE) jurisdiction. Inclusion criteria restricted participation to regular day-attending students; open-school and vocational stream students were excluded.
- 3) **Variables Studied** – The investigation focused exclusively on five constructs: **Classroom Climate, Parental Involvement, Psychological Capital, Student Engagement, and Achievement in English**. Other psychological or socio-cultural variables (e.g., teacher efficacy, peer influence, or home language environment) were not considered.
- 4) **Measurement Instruments** – The Data were collected using standardized and researcher-developed tools, validated within the Indian educational context. The instruments were self-report in nature; hence, responses reflect students' perceptions and may not capture all behavioural nuances.
- 5) **Temporal Frame** – The study employed a '**cross-sectional design**'; all data were gathered during a single academic session. Longitudinal changes or intervention effects over time were beyond its purview.
- 6) **Curricular Context** – Achievement in English was assessed through a curriculum-aligned test constructed in accordance with **WBCHSE** learning outcomes. Therefore, interpretations of achievement are limited to that curriculum framework and grade level.

These delimitations were purposefully established to maintain coherence between objectives, variables, and methodological feasibility. While they restrict the scope of generalization, they strengthen internal validity by ensuring contextual precision and manageable boundaries for data collection and analysis.

The present study is organized into five chapters, each following a logical and sequential framework that ensures coherence between theoretical grounding, methodological design, empirical analysis, and interpretive discussion. Chapter 1 introduces the problem, situates the study within the global and national context of English language learning, and explains the

theoretical perspectives, objectives, hypotheses, and delimitations that guide the research. Chapter 2 reviews relevant literature, tracing conceptual foundations and empirical studies on classroom climate, parental involvement, psychological capital, engagement, and English achievement to identify research gaps. Chapter 3 outlines the methodology, describing the research design, sample, tools, procedures, and statistical techniques adopted for data collection and analysis. Chapter 4 presents and interprets the findings in relation to the research objectives and prior evidence. Chapter 5 summarizes the study, draws conclusions, and offers practical and policy-oriented recommendations. Overall, this organization provides a clear and systematic roadmap for understanding the interrelationships among the study variables and their implications for improving English language learning outcomes.

In conclusion, this chapter has laid the conceptual and contextual foundation for the present investigation by delineating the research problem, theoretical bases, and scope of inquiry. It has clarified the significance of examining classroom climate, parental involvement, psychological capital, and student engagement in shaping English achievement among secondary school students in West Bengal. The subsequent chapter builds upon this groundwork by presenting a comprehensive review of relevant literature and theoretical perspectives that inform the present study.

CHAPTER II: REVIEW OF LITERATURE

CHAPTER II: REVIEW OF LITERATURE

Introduction to literature review

The present literature synthesis provides an integrative examination of conceptual foundations and empirical evidence that inform this inquiry into the multifaceted associations among contextual variables, individual psychological resources, and English language proficiency outcomes within secondary education settings. This chapter systematically explores how Classroom Climate and Parental Involvement shape academic performance, with particular emphasis on intermediary processes involving Psychological Capital and Student Engagement. The review's organizational structure establishes theoretical underpinnings, investigates direct associations among constructs, and elucidates the complex mechanisms whereby contextual factors influence language acquisition outcomes.

The scope of this review encompasses global scholarship while retaining specific attention to India's educational landscape and the distinctive circumstances confronting English as a 'Second Language' learner in multilingual contexts. By integrating insights from varied theoretical orientations—including 'ecological systems frameworks,' 'social cognitive perspectives,' 'positive psychological paradigms,' and 'second language acquisition scholarship'—this chapter consolidates empirical evidence supporting the conceptual architecture guiding this investigation.

This systematic examination fulfills several essential purposes: constructing solid theoretical groundwork for research propositions, pinpointing notable knowledge deficits requiring scholarly attention, furnishing empirical rationale for methodological selections, and situating this research within the expansive domain of educational psychology and applied linguistics. The synthesis illuminates how contextual variables operate via intricate intermediary mechanisms to shape language acquisition results, thereby advancing both conceptual comprehension and applied implementations in pedagogical contexts.

2.1 Theoretical Foundations for Understanding Educational Environments and Language Achievement

The theoretical foundation for this study drew from multiple complementary frameworks that collectively provide a comprehensive lens for understanding how contextual factors influence student learning and development. These theoretical perspectives inform the conceptual model underlying the present research and provide the foundation for understanding the complex interactions between environmental factors and student outcomes in English language learning contexts.

2.1.1 Ecological Systems Theory and Educational Environments

Bronfenbrenner's 'ecological framework' (1979, 1986) offers fundamental theoretical grounding for comprehending how diverse environmental strata interact to influence learner development and academic performance. This conceptual model proves especially pertinent for understanding English acquisition processes, as it acknowledges that language learning unfolds within hierarchically embedded influence systems spanning from proximal interpersonal interactions to distal cultural and institutional contexts (Bronfenbrenner & Morris, 2006).

The microsystem constitutes the most proximal environmental stratum, encompassing contexts wherein learners engage in direct, interpersonal exchanges. Within educational frameworks, the classroom microsystem incorporates educator-learner relationships, peer dynamics, pedagogical approaches, and physical setting attributes that collectively establish the immediate milieu for English language acquisition. Empirical evidence consistently indicates that microsystem environmental quality substantially influences language learning trajectories, with supportive Classroom Climate and affirmative educator relationships functioning as critical catalysts for linguistic development (García & Wei, 2014; Cummins, 2008).

Contemporary applications of 'ecological systems frameworks' in educational scholarship have underscored the dynamic character of microsystem influences. Tong and colleagues (2024) synthesized research employing Bronfenbrenner's 'bioecological model,' determining that efficacious educational initiatives systematically address multiple microsystem elements concurrently rather than targeting isolated components. Their synthesis demonstrated that Classroom Climate interventions achieve optimal effectiveness when integrating educator support, collaborative peer engagement, and environmental design modifications as mutually reinforcing elements within the learning ecosystem. The familial microsystem constitutes an additional vital component of the proximal environment shaping English acquisition processes. Parental Involvement, household linguistic practices, and domestic literacy contexts establish microsystem conditions that facilitate or constrain language development trajectories. Current scholarship has emphasized the necessity of interpreting family microsystems within their sociocultural frameworks, acknowledging that productive Parental Involvement may manifest through varied modalities across culturally diverse populations (Lenhoff, 2022).

The mesosystem encompasses the interactions and relationships between different microsystems in which 'the student' participates. For English language learners, the alignment or misalignment between home and school language practices can significantly influence learning outcomes. When families and schools work collaboratively to support English

language development, students benefit from consistent messages about the importance of language learning and coordinated support across contexts (García & Kleifgen, 2010).

Research on 'mesosystem influences' has revealed the critical importance of school-family partnerships in supporting language learning. Effective 'mesosystem functioning' requires ongoing communication between teachers and families, shared understanding of language learning goals, and coordinated strategies for supporting student development across home and school contexts. Studies have shown that students whose families and schools maintain strong 'mesosystem connections' demonstrate higher levels of engagement and achievement in English language learning (Henderson & Mapp, 2002).

The exosystem includes broader community and institutional factors that indirectly influence students' language learning experiences. In the Indian context, this encompasses factors such as language policies, teacher preparation programs, resource allocation, and community attitudes toward English language learning. These factors shape 'the quality of educational opportunities' available to 'students' and influence 'the effectiveness of' Classroom Climate and family support systems (Mohanty, 2019).

Contemporary research has highlighted 'the significant impact of' exosystem factors on language learning 'outcomes.' Educational policies that support multilingual education, provide adequate resources for English language instruction, and ensure high-quality teacher preparation create 'exosystem conditions' that facilitate language learning success. Conversely, policies that neglect language education or fail to provide adequate support for English language learners create barriers to achievement that individual students and teachers struggle to overcome.

The macrosystem encompasses the broader cultural, social, and economic contexts that influence language learning. In West Bengal, this includes historical and contemporary attitudes toward English, the role of English in social mobility and economic opportunity, and cultural values related to multilingualism and education. Understanding these broader contextual factors is essential for interpreting the relationships between immediate environmental factors and student outcomes (Sen, 2015).

'Macrosystem influences' on English language learning in India reflect complex historical and contemporary dynamics. The colonial legacy of English education, combined with contemporary

globalization pressures and economic imperatives, creates a 'macrosystem context' where English proficiency carries substantial social and economic significance. These broader forces shape how families, communities, and educational institutions value and support English

language learning, influencing the microsystem and mesosystem environments in which individual students develop their language capabilities.

2.1.2 Social Cognitive Theory and Language Learning Environments

'Social cognitive theory,' articulated by Bandura (1986, 2001), furnishes essential insights into how contextual variables shape individual psychological mechanisms and behaviors contributing to language acquisition success. This theoretical framework emphasizes 'triadic reciprocal interactions' among environmental conditions, personal attributes, and behavioral manifestations, rendering it especially pertinent for comprehending how Classroom Climate and Parental Involvement influence learners' Psychological Capital, Student Engagement, and Achievement in English.

The foundational principle of 'triadic reciprocity' posits that contextual variables, individual characteristics, and behavioral patterns continuously interact in dynamic configurations. Within English acquisition contexts, this signifies that Classroom Climate shapes learners' 'self-efficacy' and 'motivational orientations,' which subsequently affect their Student Engagement in linguistic activities, which then influences Achievement in English outcomes while further modifying their 'self-perceptions' and 'the instructional environment' (Bandura, 2001).

Contemporary scholars have furnished compelling empirical support for 'triadic reciprocity' within language acquisition contexts. Adiyono and colleagues (2025) executed a comprehensive investigation examining how 'self-regulated learning strategies,' 'family support,' and 'self-efficacy' interact to influence 'academic procrastination patterns' among Indonesian English learners. Their results revealed distinct 'reciprocal associations' among environmental support (Parental Involvement), personal variables ('self-efficacy component' of Psychological Capital), and behavioral manifestations ('self-regulated learning strategies' related to Student Engagement), corroborating 'social cognitive theory's' propositions regarding 'the dynamic character' of these interrelationships.

'Self-efficacy,' a pivotal construct within 'social cognitive frameworks' and a core component of Psychological Capital, denotes individuals' convictions regarding their capabilities to execute specific tasks or attain particular objectives (Bandura, 1997). Empirical evidence consistently indicates that 'self-efficacy' constitutes a powerful predictor of language acquisition success, shaping learners' readiness to undertake challenging linguistic tasks, their tenacity when encountering obstacles, and their overall Achievement in English. 'Self-efficacy beliefs' prove especially consequential in language learning contexts because they influence learners' propensity to assume communicative risks, participate in interactive language activities (aspects of Student Engagement), and persevere through 'the inherent challenges'

characterizing language acquisition processes (Pajares, 1996; Schunk & Pajares, 2002).

Environmental factors, particularly 'classroom climate' and 'parental support,' play crucial roles in developing and maintaining students' 'self-efficacy' for English language learning. Supportive classroom environments that provide appropriate challenges, constructive feedback, and opportunities for success help students develop confidence in their language abilities. Research has shown that teachers who create 'psychologically safe environments,' provide 'scaffolded support' for language learning, and celebrate student progress contribute significantly to 'the development' of student 'self-efficacy' (Dorman, 2001).

Similarly, 'parental encouragement' and support for English language learning contribute to students' beliefs about their capabilities and 'the value' of language proficiency. Parents who express confidence in their children's language learning abilities, provide resources and opportunities for language practice, and maintain positive attitudes toward English learning help foster high 'self-efficacy' in their children. Recent research has highlighted 'the importance of'

'parental involvement' that is characterized by realistic expectations, consistent encouragement, and recognition of effort rather than just outcomes in building students' language learning 'self-efficacy' (Usher & Pajares, 2008).

Beyond 'self-efficacy,' 'social cognitive theory' emphasizes 'observational learning' and 'modeling' as fundamental mechanisms through which students acquire language skills and learning strategies. In classroom contexts, students learn not only from direct instruction but also by observing teachers demonstrating language use, peers engaging in communicative activities, and successful models of language learning behavior. This 'vicarious learning' process is particularly important in language classrooms where students can observe and imitate pronunciation patterns, conversational strategies, and approaches to reading and writing tasks (Schunk, 1987).

The quality of Classroom Climate significantly influences 'the effectiveness' of 'observational learning.' In supportive classroom environments where mistakes are viewed as learning opportunities and students feel comfortable taking risks, 'observational learning' becomes more effective. Students are more willing to attempt new language forms and strategies when they see peers being supported through their attempts and receiving constructive feedback. Conversely, in classrooms characterized by fear of error or excessive competition, students may be reluctant to engage in 'the kind' of risk-taking necessary for language development (Bandura, 1997).

'Self-regulation,' another central concept in 'social cognitive theory,' refers to students' abilities

to set goals, monitor their progress, employ effective learning strategies, and adjust their approaches based on feedback. In language learning contexts, 'self-regulated learners' are those who actively manage their own learning processes, seeking out opportunities for practice, monitoring their comprehension and production, and making strategic adjustments to improve their language skills. Research has consistently shown that 'self-regulation' is strongly associated with language learning success and is a key component of Student Engagement (Zimmerman, 2000).

Both Classroom Climate and Parental Involvement contribute to 'the development' of 'self-regulatory skills.' Teachers who provide explicit instruction in learning strategies, encourage students to set personal language learning goals, and help students reflect on their learning processes foster 'self-regulation.' Similarly, parents who help structure home study routines, encourage their children to take responsibility for their learning, and support goal-setting and progress monitoring contribute to 'the development' of 'self-regulatory capabilities' (Pomerantz, Moorman, & Litwack, 2007).

'Collective efficacy,' an extension of 'self-efficacy' to 'the group level,' represents shared beliefs among students and teachers about their collective capability to accomplish educational goals. In language learning contexts, 'collective efficacy' reflects 'the shared belief' within a classroom or school community that students can successfully learn English and that teachers can effectively support that learning. Research has shown that 'collective efficacy' is associated with higher levels of student achievement and more positive classroom climates (Goddard, Hoy, & Hoy, 2000).

'Outcome expectations,' distinct from 'efficacy beliefs,' refer to individuals' beliefs about 'the consequences' of their actions. In language learning contexts, students' 'outcome expectations' include their beliefs about 'the benefits' of English proficiency for their future education, career opportunities, and social interactions. These expectations influence students' motivation to invest effort in language learning and their persistence through challenges. Parental Involvement plays a crucial role in shaping students' 'outcome expectations' by communicating 'the value' of English proficiency and helping students understand how language skills connect to their future goals (Bandura, 1997).

The integration of 'social cognitive theory' with 'ecological systems perspectives' provides a comprehensive framework for understanding how environmental factors influence language learning outcomes through psychological mechanisms. Classroom Climate and Parental Involvement operate as environmental supports that shape students' 'self-efficacy,' provide models for 'observational learning,' foster 'self-regulatory skills,' and influence 'outcome

expectations.' These psychological mechanisms, in turn, determine students' Student Engagement in language learning activities and ultimately their Achievement in English.

2.1.3 Positive Psychology and Psychological Capital in Educational Contexts

'Positive psychology,' pioneered by Seligman (1999, 2011), represents a paradigm shift from 'deficit-focused approaches' to education toward 'strength-based perspectives' that emphasize 'the development of positive psychological resources.' This theoretical framework is particularly relevant for understanding how Psychological Capital influences students' engagement and achievement in English language learning contexts.

Psychological Capital (PsyCap), as conceptualized by Luthans, Youssef, and Avolio (2007), comprises 'four interrelated positive psychological resources': hope, efficacy, resilience, and optimism. These resources are 'considered state-like' rather than 'trait-like,' meaning they can be developed and enhanced through appropriate interventions and supportive environments. This characteristic makes PsyCap particularly relevant for educational applications, as it suggests that schools and families can actively foster these 'positive psychological resources' in students.

Recent research has provided compelling evidence for 'the relevance of psychological capital' in educational contexts. Chen et al. (2025) conducted a comprehensive study examining 'the mediating role of psychological capital' in 'the relationship between' social support and academic engagement among EFL learners. Their findings demonstrated that Psychological Capital significantly mediated 'the relationship between' environmental support and student outcomes, providing strong empirical support for 'the theoretical model' underlying the present study.

'Hope,' as defined by Snyder (2002), involves both 'the motivation to pursue goals' (agency) and 'the ability to identify pathways' to achieve those goals (pathways). In English language learning contexts, 'hopeful students' are more likely to set specific language learning goals, develop strategies for achieving those goals, and maintain motivation despite challenges and setbacks. 'Hope theory' emphasizes 'the importance of' both 'willpower' and 'waypower' in goal achievement, suggesting that effective interventions must address both motivational and strategic components of hope.

Research has consistently demonstrated that 'hope' is positively associated with academic achievement and engagement across diverse educational contexts. Students with high hope demonstrate greater persistence in 'the face of challenges,' more effective 'goal-setting behaviors,' and higher levels of academic achievement. In language learning contexts, 'hopeful students' are more likely to engage in challenging language tasks, seek out opportunities for

language practice, and maintain motivation through 'the inevitable difficulties' of language acquisition (Curry & Snyder, 2000; Rand, 2009).

Environmental factors play crucial roles in fostering 'hope' in students. Classroom environments that help students set realistic but challenging goals, provide multiple pathways for achieving those goals, and support students in developing effective learning strategies contribute to 'the development of hope.' Teachers who help students break down complex language learning goals into manageable steps, provide multiple approaches to language learning, and celebrate progress toward goals foster 'hope' in their students.

'Efficacy,' consistent with Bandura's conceptualization of 'self-efficacy,' refers to 'individuals' confidence' in their ability to mobilize cognitive resources and take actions necessary to achieve specific goals (Luthans et al., 2007). In language learning contexts, 'efficacy' involves 'students' confidence' in their ability to master English skills, communicate effectively in English, and succeed in English-related academic tasks. High 'efficacy' students are more likely to engage in challenging language activities and persist through difficulties.

'The development of efficacy' in language learning contexts requires carefully structured experiences of success, appropriate challenges, and supportive feedback. Environmental factors that contribute to 'efficacy development' include classroom climates that provide 'psychological safety' for 'risk-taking,' instructional practices that 'scaffold' student success, and assessment approaches that focus on growth and improvement rather than comparison with others.

'Resilience' involves 'the capacity to bounce back' from adversity, 'adapt to' challenging circumstances, and maintain positive functioning in 'the face of' stress or setbacks (Masten, 2001). For English language learners, 'resilience' is particularly important because language acquisition involves inevitable mistakes, misunderstandings, and periods of frustration. 'Resilient students' are better able to view these challenges as learning opportunities rather than failures, maintaining their motivation and engagement in language learning activities.

Research on 'resilience' in educational contexts has identified multiple factors that contribute to 'resilience development.' Supportive relationships with teachers and peers, opportunities to develop 'coping skills,' and environments that normalize struggle and growth as part of learning all contribute to 'resilience.' In language learning contexts, 'resilience' is fostered by classroom climates that treat errors as learning opportunities, provide emotional support during challenging periods, and help students develop effective 'coping strategies' for language learning difficulties.

'Optimism' refers to 'positive attributional styles' and expectations about future outcomes

(Seligman, 1991). 'Optimistic students' tend to attribute successes to 'internal, stable factors' and view setbacks as temporary and specific rather than permanent and pervasive. In English language learning, 'optimism' supports sustained effort and engagement by helping students maintain positive expectations about their ability to improve their language skills over time.

Environmental factors that foster 'optimism' include classroom climates that emphasize growth and improvement, instructional practices that help students recognize progress, and feedback approaches that focus on specific, actionable steps for improvement. Teachers who help students develop realistic but positive expectations about language learning, celebrate incremental progress, and maintain encouraging attitudes contribute to student 'optimism.'

'The integration of these four psychological resources' creates 'a synergistic effect' that enhances students' overall Psychological Capital and their capacity to thrive in educational environments (Luthans et al., 2007). Students with high Psychological Capital are better equipped to navigate 'the challenges of' English language learning, maintain motivation and engagement, and achieve higher levels of academic success.

Recent research has provided strong empirical support for 'the synergistic effects of' Psychological Capital components. Youssef-Morgan (2024) conducted a comprehensive review of 25 years of Psychological Capital research, finding consistent evidence that 'the four components' work together to create positive outcomes that exceed 'the sum of their individual effects.' This research supports 'the theoretical rationale' for examining Psychological Capital as 'a higher-order construct' rather than focusing on individual components in isolation.

2.1.4 Conclusion: Theoretical Foundations

The theoretical foundations examined in this review demonstrate 'the complementary nature of' 'ecological systems theory,' 'social cognitive theory,' and 'positive psychology' in understanding English language achievement. Ecological systems theory provides the overarching framework for understanding how multiple environmental levels influence student development, while social cognitive theory explains the reciprocal relationships between environmental factors, personal characteristics, and behaviors. Positive psychology contributes insights into the internal psychological resources that enable students to thrive in supportive environments. Together, these theoretical perspectives provide a comprehensive foundation for understanding how classroom climate and parental involvement influence student outcomes through psychological capital and engagement mechanisms. The integration of these theories supports the conceptual model underlying this study and provides theoretical justification for examining mediation pathways in English language learning contexts.

2.2 Classroom Climate and English Language Achievement

Classroom Climate represents one of 'the most significant environmental factors' influencing students' learning experiences and academic outcomes in English language education. The extensive research literature on Classroom Climate demonstrates 'its multifaceted nature' and 'its profound impact' on various aspects of student development, particularly in 'second language learning contexts' where environmental support is crucial for overcoming language barriers and building confidence in language use.

2.2.1 Conceptual Foundations of Classroom Climate

Classroom Climate encompasses 'the physical, social, emotional, and intellectual characteristics of learning environments' that collectively influence students' experiences and outcomes (Fraser, 1998; Cohen et al., 2009). This 'multidimensional construct' has been conceptualized and measured in various ways across different research traditions, but there is general consensus that Classroom Climate involves both 'objective environmental characteristics' and 'subjective student perceptions' of their learning environment.

'The physical dimension of classroom climate' includes factors such as lighting, temperature, noise levels, seating arrangements, and 'the availability of learning resources.' Research has demonstrated that 'physical environmental factors' can significantly influence students' comfort, attention, and engagement in learning activities. In English language learning contexts, 'physical environmental factors' are particularly important because language learning often requires 'sustained attention,' active participation, and collaborative interaction among students (Earthman, 2004; Barrett et al., 2015).

Recent research has provided compelling evidence for 'the impact of physical environment' on language learning outcomes. The World Bank's 'RIGHT+ Framework for Physical Learning Environments' (2025) synthesizes extensive research demonstrating that 'well-designed physical spaces' can significantly increase learning outcomes for all students, with particularly strong effects for language learners who benefit from 'flexible spaces' that support collaborative interaction and communication practice.

Costa et al. (2024) conducted a comprehensive study examining 'the relationship between' 'physical dimensions of home learning environments' and young people's learning outcomes. Their research revealed that 'physical environmental factors,' including lighting, noise levels, and space organization, significantly predicted language learning success. Students in 'well-designed physical environments' demonstrated greater willingness to participate in speaking activities, higher levels of engagement in collaborative language tasks, and improved overall language learning outcomes.

Research from the Waisman Center (2024) has provided new insights into how 'physical environment' shapes language learning in young learners. Their studies demonstrate that 'environmental factors' such as visual displays, interactive materials, and 'flexible seating arrangements' create conditions that support language development by encouraging exploration, interaction, and communication. These findings highlight 'the importance of designing' 'physical environments' that actively support language learning processes rather than simply providing neutral spaces for instruction.

'The social dimension of classroom climate' involves 'the quality of interpersonal relationships' and 'interactions among students' and between students and teachers. In English language learning contexts, 'positive social climate' is particularly crucial because language learning is inherently social and requires opportunities for meaningful interaction and communication (Johnson & Johnson, 2009; Harré & Pianta, 2001).

Research has consistently demonstrated that classrooms characterized by 'positive peer relationships,' 'collaborative learning opportunities,' and 'supportive social interactions' promote greater engagement and achievement in language learning. Students in 'socially supportive environments' are more willing to take risks in language use, participate in speaking activities, and engage in collaborative language tasks that are essential for developing communicative competence (Slavin, 1995; Gillies, 2003).

Contemporary research has expanded understanding of 'social climate' in language learning contexts. Li et al. (2025) conducted a comprehensive investigation of how 'collaborative learning activities' enhance Student Engagement in English programs at public sector colleges. Their findings demonstrated that 'collaborative learning environments' create 'social climates' that support language development through multiple mechanisms, including increased opportunities for meaningful interaction, peer support for language learning, and reduced anxiety about language use.

'The emotional dimension of classroom climate' encompasses factors such as 'emotional safety,' acceptance, belonging, and support for 'risk-taking' in learning. 'Emotional climate' is particularly important in language learning contexts because language use involves vulnerability and 'risk-taking' that require emotional support and safety (Reyes et al., 2012; Durlak et al., 2011).

Recent research has provided strong evidence for 'the importance of emotional climate' in language learning. Alamer et al. (2025) conducted an experimental study examining 'the relationship between' 'language anxiety' and achievement, finding that creating relaxed classroom atmospheres significantly reduced 'language anxiety' and improved learning

outcomes. Their research demonstrated that 'emotional safety' is 'a direct precursor' to academic success in language learning contexts.

'The emotional dimension of classroom climate' is closely related to concepts of 'psychological safety' and belonging. Students who feel 'emotionally safe' in their classrooms are more likely to engage in 'the risk-taking behaviors' necessary for language learning, including speaking in 'the target language,' asking questions, and making mistakes as part of 'the learning process.' Teachers who create 'emotionally supportive environments' help students develop 'the confidence' and resilience necessary for successful language learning.

'The intellectual dimension of classroom climate' pertains to 'the pedagogical and academic characteristics of the classroom,' including 'the clarity of instruction,' 'the level of academic press' (high but achievable expectations), and 'the degree to which' critical thinking is encouraged. 'High-quality instructional practices,' where teachers provide clear feedback and differentiated support, are 'a cornerstone of positive intellectual climate' (Ma et al., 2024).

Research on 'intellectual climate' in language learning contexts has emphasized 'the importance of' maintaining high expectations while providing appropriate support for student success. Effective 'intellectual climates' in language classrooms are characterized by clear learning objectives, 'scaffolded instruction' that supports student progress, and assessment practices that focus on growth and improvement rather than comparison with others.

Ma et al. (2024) conducted a comprehensive study examining 'the relationships among' Classroom Climate, 'growth mindset,' 'achievement goal orientation,' and Student Engagement. Their findings revealed that 'intellectual climate factors,' including teacher enthusiasm, clear expectations, and support for critical thinking, significantly predicted Student Engagement and achievement in language learning contexts. Students in classrooms with 'positive intellectual climates' demonstrated higher levels of cognitive engagement, more effective learning strategies, and greater academic achievement.

2.2.2 Teacher Support and Instructional Quality in English Language Learning

'Teacher support' and 'instructional quality' represent critical components of Classroom Climate that directly influence student outcomes in English language learning. Research has consistently demonstrated that teachers who provide 'high-quality instruction,' emotional support, and appropriate scaffolding create classroom climates that facilitate language acquisition and promote student success.

'Instructional support' encompasses 'the ways' teachers help students learn and understand content, including 'the clarity of instruction,' 'the quality of feedback,' and 'the appropriateness of instructional methods' for student needs. In English language learning contexts, effective

'instructional support' requires teachers to understand 'the unique challenges of second language acquisition' and to implement 'evidence-based practices' that support language development (Hamre & Pianta, 2001; Pianta et al., 2008).

Recent research has highlighted 'the importance of' culturally responsive instructional practices in supporting English language learners. Teachers who understand their students' cultural backgrounds, incorporate students' home languages and cultures into instruction, and adapt their teaching methods to meet diverse learning needs create more effective learning environments for language learners. This approach recognizes that effective instruction must be responsive to 'the cultural and linguistic diversity' that students bring to the classroom.

Contemporary research on 'instructional quality' in language education has emphasized 'the importance of' explicit instruction combined with opportunities for meaningful communication. Effective language teachers provide clear explanations of language structures and functions

while also creating opportunities for students to use language in authentic, communicative contexts. This balanced approach helps students develop both accuracy and fluency in English language use.

Emotional support from teachers involves the warmth, sensitivity, and responsiveness that teachers show toward students. Emotionally supportive teachers create classroom climates characterized by positive relationships, emotional safety, and respect for student perspectives. In language learning contexts, emotional support is particularly important because language use involves vulnerability and risk-taking that require teacher understanding and encouragement (Hamre & Pianta, 2001).

Research has demonstrated that emotionally supportive teachers help students develop the confidence and motivation necessary for successful language learning. Students who feel supported by their teachers are more likely to engage in challenging language tasks, persist through difficulties, and maintain positive attitudes toward language learning. Emotional support from teachers also helps students develop resilience and coping strategies for managing the challenges of language acquisition.

Classroom organization refers to the ways teachers structure the classroom environment, manage student behavior, and organize learning activities. Well-organized classrooms provide clear expectations, consistent routines, and effective management of time and resources. In language learning contexts, effective classroom organization creates predictable environments that support language learning while providing flexibility for communicative activities and collaborative learning (Pianta et al., 2008).

Recent research has highlighted the importance of flexible classroom organization that supports diverse language learning activities. Effective language teachers create classroom environments that can accommodate individual work, small group collaboration, and whole class discussions. They establish routines that support language learning while maintaining flexibility to respond to student needs and interests.

2.2.3 Classroom Management and Academic Emphasis in Language Learning

Effective classroom management and appropriate academic emphasis are essential components of positive classroom climate in language learning contexts. Research has demonstrated that classrooms characterized by clear expectations, consistent routines, and high but achievable academic standards create environments that support language learning and promote student success.

Classroom management in language learning contexts involves creating and maintaining environments that support language use, communication, and collaboration while managing the unique challenges of multilingual classrooms. Effective classroom management in language learning requires teachers to understand the social and cultural dynamics of multilingual environments and to implement strategies that support positive interactions among students from diverse linguistic backgrounds.

Recent research has provided new insights into effective classroom management strategies for language learning contexts. Studies have shown that teachers who establish clear expectations for language use, create structured opportunities for peer interaction, and implement consistent routines for language learning activities create more effective learning environments. These management strategies help students feel secure and supported while engaging in the challenging work of language learning.

Contemporary research on classroom management in language education has emphasized the importance of culturally responsive management practices. Teachers who understand their students' cultural backgrounds and communication styles are better able to create management systems that support all students while respecting cultural diversity. This approach recognizes that effective classroom management must be adapted to the cultural and linguistic characteristics of the student population.

Academic emphasis refers to the degree to which classrooms maintain high expectations for student achievement while providing appropriate support for student success. In language learning contexts, appropriate academic emphasis involves setting challenging but achievable goals for language development, maintaining high expectations for all students, and providing the support necessary for students to meet those expectations.

Research has demonstrated that classrooms with appropriate academic emphasis create environments that promote language learning through multiple mechanisms. High expectations communicate to students that they are capable of success, while appropriate support helps students develop the skills and confidence necessary to meet those expectations. This combination of challenge and support creates optimal conditions for language learning.

Recent research has highlighted the importance of growth-oriented academic emphasis in language learning contexts. Rather than focusing solely on achievement outcomes, effective academic emphasis in language classrooms emphasizes progress, improvement, and the development of language learning strategies. This approach helps students maintain motivation and engagement while developing the skills necessary for long-term language learning success.

2.2.4 Conclusion: Classroom Climate and English Language Achievement

The extensive body of research reviewed demonstrates that classroom climate is a significant and consistent predictor of English language achievement across diverse educational contexts. Positive classroom climates characterized by teacher support, emotional safety, intellectual challenge, and clear expectations create optimal conditions for second language acquisition. The evidence reveals that classroom climate influences language learning through multiple pathways, including enhanced motivation, reduced anxiety, increased participation, and improved teacher-student relationships. Contemporary research emphasizes the multidimensional nature of classroom climate and the importance of addressing social, emotional, and academic dimensions simultaneously. The findings consistently support the hypothesis that positive classroom climates directly enhance English language achievement while also operating through mediating mechanisms such as psychological capital and student engagement.

A critical comparative reading of the classroom climate literature, however, reveals an important contextual tension that merits acknowledgement. While a substantial body of research reports strong, consistent positive associations between classroom climate and academic achievement in Western settings (Pianta et al., 2008; Hamre & Pianta, 2001), studies conducted in under-resourced government schools in South Asian contexts report weaker or non-significant direct effects on language achievement, suggesting that when basic infrastructural conditions are severely constrained, the affective quality of the classroom may carry limited independent influence (Mohanty, 2019; ASER, 2022). A further tension exists between studies emphasising the teacher-student relationship dimension as the dominant climate factor (Hamre & Pianta, 2001) and those foregrounding the physical and structural environment (Earthman, 2004). This critical perspective informed the present study's decision

to model classroom climate as a distal environmental predictor mediated by psychological and behavioural mechanisms, rather than as a direct standalone determinant of English achievement.

2.3 Parental Involvement and English Language Achievement

Parental involvement represents a critical environmental factor that significantly influences students' academic outcomes, particularly in English language learning contexts where family support can bridge cultural and linguistic gaps between home and school environments. The extensive research literature on parental involvement demonstrates its multifaceted nature and its profound impact on various aspects of student development, with particular relevance for English as a Second Language (ESL) learners who navigate complex linguistic and cultural landscapes.

2.3.1 Conceptual Foundations of Parental Involvement

Parental involvement encompasses a broad range of activities, behaviors, and attitudes through which parents support their children's educational development. This multidimensional construct has been conceptualized in various ways across different research traditions, but there is general consensus that effective parental involvement involves both home-based and school-based activities that support student learning and development (Epstein, 2001; Henderson & Mapp, 2002).

Home-based involvement includes activities that parents engage in within the home environment to support their children's learning. These activities encompass helping with homework, providing educational resources, creating supportive learning environments, and engaging in educational conversations with children. In English language learning contexts, home-based involvement takes on particular significance as parents navigate the challenges of supporting language development while potentially having limited English proficiency themselves (García & Kleifgen, 2010).

Recent research has provided new insights into the complexity of home-based involvement for English language learners. Al Murshidi (2023) conducted a comprehensive study examining parental involvement in English as a foreign language learning among elementary school children, identifying both challenges and solutions for effective family engagement. The study revealed that parents face significant barriers including limited English proficiency, unfamiliarity with educational systems, and lack of resources, but also demonstrated that culturally responsive approaches to family engagement can overcome these barriers.

Contemporary research has emphasized the importance of recognizing diverse forms of home-

based involvement that may not align with traditional Western models of parental engagement. Parents from different cultural backgrounds may support their children's education through activities such as storytelling in heritage languages, emphasizing the value of education, and providing moral and emotional support, even when they cannot directly assist with English language homework (Henderson & Mapp, 2002).

School-based involvement encompasses activities that parents engage in within the school environment, including attending parent-teacher conferences, volunteering in classrooms, participating in school events, and communicating with teachers about their children's progress. For English language learners, school-based involvement can be particularly challenging due to language barriers, cultural differences, and parents' own educational experiences (Epstein, 2001).

Research has consistently demonstrated that effective school-based involvement requires schools to create welcoming, culturally responsive environments that accommodate diverse family backgrounds and communication styles. Schools that provide translation services, offer flexible meeting times, and demonstrate respect for diverse cultural perspectives are more successful in engaging families of English language learners (García & Kleifgen, 2010).

Recent developments in family engagement research have highlighted the importance of bidirectional communication between families and schools. Rather than viewing parental involvement as a one-way process in which schools inform parents about their children's progress, effective engagement involves ongoing dialogue in which parents and educators share information, perspectives, and strategies for supporting student success (Henderson & Mapp, 2002).

Academic socialization represents a third dimension of parental involvement that has received increasing attention in recent research. Academic socialization involves parents' communication of educational values, expectations, and aspirations to their children. This dimension of involvement is particularly relevant for English language learners, as parents' attitudes toward English learning and their communication of the value and importance of English proficiency significantly influence students' motivation and engagement (Hill & Tyson, 2009).

Research has demonstrated that academic socialization can be particularly powerful for students from diverse cultural backgrounds because it does not require parents to have specific knowledge of curriculum content or English proficiency. Parents can effectively engage in academic socialization by expressing high expectations for their children's education, emphasizing the importance of effort and persistence, and connecting educational achievement

to future opportunities and goals (Hill & Tyson, 2009).

2.3.2 Cultural and Linguistic Considerations in Parental Involvement

The involvement of parents in English language learning is significantly influenced by cultural and linguistic factors that shape family perspectives on education, communication styles, and relationships with schools. Understanding these cultural and linguistic considerations is essential for developing effective approaches to family engagement that respect diverse backgrounds while supporting student success.

Cultural perspectives on education vary significantly across different cultural groups and influence how parents understand their roles in supporting their children's education. Some cultures emphasize the primary responsibility of schools for academic instruction while viewing parents' roles as providing moral guidance and ensuring children's respect for teachers and educational institutions. Other cultures emphasize more direct parental involvement in academic activities and expect ongoing communication between families and schools (García & Kleifgen, 2010).

Recent research has highlighted the importance of understanding these cultural differences as variations in engagement styles rather than deficits in parental involvement. Parents from all cultural backgrounds care deeply about their children's education and want to support their success, but they may express this support in ways that differ from traditional Western models of parental involvement (Henderson & Mapp, 2002).

Contemporary studies have provided compelling evidence for the effectiveness of culturally responsive approaches to family engagement. The U.S. Department of Education's Parent and Family Engagement Guidance (2025) emphasizes the importance of recognizing and building upon the diverse strengths that families bring to their children's education, including cultural knowledge, linguistic resources, and educational values that may differ from mainstream approaches.

Language barriers represent significant challenges for many families of English language learners who want to support their children's education but face difficulties communicating with schools and understanding educational materials. These barriers can prevent parents from accessing information about their children's progress, participating in school activities, and advocating for their children's needs (García & Kleifgen, 2010).

Research has demonstrated that schools can effectively address language barriers through multiple strategies including providing translation and interpretation services, offering materials in multiple languages, and training staff in culturally responsive communication practices. Schools that implement comprehensive language support services see significant

increases in family engagement and student outcomes (Henderson & Mapp, 2002).

Recent developments in family engagement have emphasized the importance of viewing multilingualism as an asset rather than a barrier. Families who maintain heritage languages while supporting English development provide their children with valuable linguistic resources that can enhance rather than hinder English language learning. Schools that recognize and celebrate multilingualism create more welcoming environments for diverse families (García & Wei, 2014).

Socioeconomic factors also significantly influence parental involvement in English language learning. Families with limited economic resources may face practical barriers to involvement including work schedules that conflict with school activities, lack of transportation, and inability to purchase educational materials. These barriers can prevent well-intentioned parents from engaging in traditional forms of school-based involvement (Henderson & Mapp, 2002). Contemporary research has emphasized the importance of recognizing the diverse ways that families with limited resources support their children's education. Parents may work multiple jobs to provide economic stability that supports educational success, emphasize the importance of education as a pathway to economic mobility, and make significant sacrifices to ensure their children have educational opportunities (García & Kleifgen, 2010).

2.3.3 Mechanisms of Parental Influence on English Language Learning

Research has identified 'multiple mechanisms' through which Parental Involvement influences English language learning outcomes. Understanding 'these mechanisms' is essential for developing 'effective interventions' and support systems that maximize 'the positive impact' of family engagement on student success.

'Motivational mechanisms' represent one of 'the primary pathways' through which Parental Involvement influences English language learning. Parents who express 'positive attitudes' toward English learning, communicate 'high expectations' for their children's language development, and emphasize 'the importance of' English proficiency for future success help foster 'intrinsic motivation' for language learning in their children (Dörnyei, 2001).

Recent research has provided compelling evidence for 'the motivational impact' of Parental Involvement. A comprehensive study examining Parental Involvement and students' motivation in learning English found 'significant positive correlations' between various forms of family engagement and student motivation, with 'academic socialization' showing particularly strong effects (ResearchGate, 2025). The study demonstrated that parents' communication of educational values and expectations significantly predicted students' 'intrinsic motivation' for English learning.

Contemporary research on 'motivation' in language learning has emphasized 'the importance of' parents' role in helping students develop 'positive language learning identities.' Parents who help their children see English proficiency as compatible with maintaining 'heritage languages' and cultural identities support 'the development of' 'positive multilingual identities' that enhance motivation for continued language learning (García & Wei, 2014).

'Cognitive mechanisms' involve 'the ways' Parental Involvement supports 'the development of' cognitive skills and strategies that facilitate English language learning. Parents who engage in educational conversations with their children, provide 'cognitively stimulating activities,' and support 'the development of' 'academic language skills' contribute to cognitive development that supports language learning success (Hill & Tyson, 2009).

Research has demonstrated that parents can support 'cognitive development' for English language learning even when they have limited English proficiency themselves. Activities such as storytelling in 'heritage languages,' engaging in complex conversations about academic topics, and supporting 'the development of' 'critical thinking skills' all contribute to cognitive development that transfers to English language learning contexts (García & Kleifgen, 2010).

Recent studies have highlighted 'the importance of' parents' role in supporting 'the development of' 'metacognitive strategies' for language learning. Parents who help their children reflect on their learning processes, set goals for language development, and monitor their progress contribute to 'the development of' 'self-regulated learning skills' that enhance language learning effectiveness (Adiyono et al., 2025).

'Social mechanisms' involve 'the ways' Parental Involvement influences 'the social contexts' and relationships that support English language learning. Parents who maintain 'positive relationships' with schools, advocate for their children's needs, and create 'social networks' that support language learning contribute to 'social environments' that facilitate language development (Epstein, 2001).

Contemporary research has emphasized 'the importance of' parents' role in helping children navigate 'the social complexities' of 'multilingual environments.' Parents who help their children develop 'positive relationships' with peers from diverse linguistic backgrounds, understand 'the social functions' of different languages, and develop confidence in 'multilingual communication' support social development that enhances language learning (García & Wei, 2014).

'Resource mechanisms' involve 'the ways' parents provide 'material and informational resources' that support English language learning. Parents who provide books, educational materials, technology access, and learning opportunities create 'resource-rich environments'

that facilitate language development. However, research has demonstrated that 'effective resource provision' goes beyond material resources to include 'informational resources' such as knowledge about educational systems, learning strategies, and advocacy skills (Henderson & Mapp, 2002).

Recent research has highlighted 'the importance of' helping parents understand how to effectively utilize available resources to support English language learning. Parents who receive guidance on selecting appropriate educational materials, using technology for language learning, and accessing community resources are more effective in supporting their children's language development (García & Kleifgen, 2010).

2.3.4 Conclusion: Parental Involvement and English Language Achievement

Research consistently demonstrates that Parental Involvement is 'a powerful predictor' of English language achievement, with effects observed across diverse cultural and socioeconomic contexts. The evidence reveals that 'effective parental involvement' encompasses multiple dimensions, including 'home-based support,' 'school-based participation,' and 'academic socialization activities.' Contemporary research emphasizes 'the importance of' culturally responsive approaches to Parental Involvement that recognize 'diverse ways' families can support language learning while respecting cultural values and practices. The findings indicate that Parental Involvement influences English achievement through both 'direct pathways' (such as providing practice opportunities) and 'indirect pathways' (such as enhancing student 'motivation' and 'self-efficacy'). The research supports 'the hypothesis' that meaningful Parental Involvement significantly enhances English language learning outcomes while also operating through mediating psychological and behavioral mechanisms.

2.4 Student Engagement and English Language Achievement

Student engagement represents a critical mediating factor in the relationship between environmental influences and academic outcomes in English language learning. The extensive research literature on student engagement demonstrates its multidimensional nature and its central role in facilitating language acquisition, with particular relevance for understanding how classroom climate and parental involvement translate into improved learning outcomes.

2.4.1 Conceptual Foundations of Student Engagement

Student engagement encompasses the degree of attention, curiosity, interest, optimism, and passion that students show when they are learning or being taught, which extends to the level of motivation they have to learn and progress in their education (Fredricks et al., 2004). This multidimensional construct has been conceptualized as comprising three interrelated dimensions: behavioral engagement, emotional engagement, and cognitive engagement, each

of which contributes uniquely to academic success in language learning contexts.

Behavioral engagement refers to students' participation in academic activities, including attendance, effort, persistence, and compliance with classroom rules and expectations. In English language learning contexts, behavioral engagement is particularly important because language acquisition requires active participation in communicative activities, consistent practice, and sustained effort over extended periods (Skinner & Pitzer, 2012).

Recent research has provided new insights into the complexity of behavioral engagement in language learning contexts. Zhong et al. (2025) conducted a comprehensive investigation of EFL students' engagement in project-based learning, finding that behavioral engagement was characterized by active participation in collaborative activities, consistent completion of language tasks, and sustained effort in challenging communicative situations. Their research demonstrated that behavioral engagement in language learning involves not only compliance with classroom expectations but also proactive participation in language use opportunities.

Contemporary research has emphasized the importance of understanding behavioral engagement as involving both quantity and quality of participation. Students who demonstrate high behavioral engagement in language learning not only participate frequently in classroom activities but also engage in high-quality interactions that promote language development, such as asking clarifying questions, seeking feedback, and taking risks in language use (Sulis, 2024). Emotional engagement encompasses students' affective reactions to school, teachers, peers, and academic activities, including feelings of belonging, interest, enjoyment, and positive attitudes toward learning. In English language learning contexts, emotional engagement is particularly crucial because language learning involves vulnerability, risk-taking, and potential anxiety that can significantly impact learning outcomes (Pekrun & Linnenbrink-Garcia, 2012). Research has consistently demonstrated that emotional engagement is a powerful predictor of language learning success. Students who feel emotionally connected to their English classes, enjoy language learning activities, and maintain positive attitudes toward English demonstrate higher levels of achievement and persistence in language learning (Dörnyei, 2001). Emotional engagement also serves as a protective factor against language anxiety and other negative emotions that can impede language learning progress.

Recent studies have provided compelling evidence for the importance of emotional engagement in language learning contexts. Bai (2025) conducted a comprehensive study examining bilingual learning motivation and engagement among students, finding positive correlations between emotional engagement and achievement in both heritage and English languages. The study demonstrated that students who maintained positive emotional

connections to language learning showed greater persistence and higher achievement across multiple linguistic contexts.

Cognitive engagement refers to students' psychological investment in learning, including their use of learning strategies, self-regulation, and deep processing of academic content. In English language learning contexts, cognitive engagement involves students' active mental effort to understand and master language skills, their use of effective learning strategies, and their ability to monitor and regulate their own language learning processes (Fredricks et al., 2004).

Contemporary research has highlighted the particular importance of cognitive engagement for language learning success. Students who demonstrate high cognitive engagement actively seek to understand language patterns, make connections between new and existing knowledge, and employ metacognitive strategies to monitor their language learning progress. This deep level of engagement facilitates the development of both accuracy and fluency in English language use (Sulis, 2024).

Recent research has provided new insights into the temporal dynamics of cognitive engagement in language learning. Studies have shown that cognitive engagement fluctuates over time and across different learning contexts, with students showing higher levels of cognitive engagement during activities that are appropriately challenging, personally meaningful, and aligned with their learning goals (Sulis, 2024).

2.4.2 Self-Determination Theory and Student Engagement

Self-Determination Theory (SDT), developed by Deci and Ryan (1985, 2000), provides a comprehensive framework for understanding the motivational foundations of student engagement in language learning contexts. This theory emphasizes the importance of three basic psychological needs—autonomy, competence, and relatedness—in fostering intrinsic motivation and sustained engagement in learning activities.

Autonomy refers to students' need to feel volitional and self-directed in their learning activities. In English language learning contexts, autonomy involves students' sense of choice and control over their learning processes, including the ability to select learning strategies, set personal goals, and direct their own language development efforts. Research has consistently demonstrated that students who experience autonomy in language learning show higher levels of engagement and achievement (Deci & Ryan, 2000).

Recent research has provided compelling evidence for the importance of autonomy support in language learning contexts. Shelton-Strong (2025) conducted a comprehensive study examining the role of advising in language learning from a self-determination theory perspective, finding that students who received autonomy-supportive guidance showed

significantly higher levels of engagement and achievement compared to those who received controlling forms of support. The study demonstrated that autonomy support involves providing choices, acknowledging students' perspectives, and minimizing external pressures while maintaining appropriate structure and guidance.

Contemporary research has emphasized the importance of culturally responsive approaches to autonomy support that recognize diverse cultural perspectives on independence and self-direction. Students from collectivistic cultural backgrounds may experience autonomy differently than those from individualistic cultures, requiring educators to adapt autonomy support strategies to align with diverse cultural values and expectations (Yamaoka, 2025).

Competence refers to students' need to feel effective and capable of achieving desired outcomes. In English language learning contexts, competence involves students' confidence in their ability to master language skills, communicate effectively in English, and succeed in language-related academic tasks. Research has demonstrated that students' perceptions of competence are powerful predictors of engagement and achievement in language learning (Bandura, 1997).

Recent research has provided new insights into the development of competence in language learning contexts. Oga-Baldwin and Ryan (2025) conducted a comprehensive examination of competence need satisfaction in language learning, finding that students' perceptions of competence are influenced by multiple factors including task difficulty, feedback quality, and social comparison processes. Their research demonstrated that effective competence support involves providing appropriately challenging tasks, offering specific and constructive feedback, and helping students recognize their progress and growth.

Contemporary research has emphasized the importance of growth-oriented approaches to competence development that focus on improvement and progress rather than comparison with others. Students who understand language learning as a developmental process and receive feedback that emphasizes growth and improvement show higher levels of competence satisfaction and sustained engagement in language learning activities (Li, 2024).

Relatedness refers to students' need to feel connected to others and to experience a sense of belonging in their learning environments. In English language learning contexts, relatedness involves positive relationships with teachers and peers, a sense of belonging in the classroom community, and connections between language learning and students' personal and cultural identities (Deci & Ryan, 2000).

Research has consistently demonstrated that relatedness is particularly important for English language learners who may feel marginalized or disconnected from mainstream educational

environments. Students who experience positive relationships with teachers and peers, feel accepted and valued in their classrooms, and see connections between English learning and their personal goals show higher levels of engagement and achievement (García & Wei, 2014). Recent studies have provided compelling evidence for the importance of culturally responsive approaches to relatedness support. Students from diverse cultural and linguistic backgrounds need to feel that their heritage languages, cultures, and identities are valued and respected in English learning environments. Teachers who demonstrate cultural competence, incorporate diverse perspectives into instruction, and create inclusive classroom communities support relatedness satisfaction for all students (Tuan, 2025).

2.4.3 Dimensions of Engagement in Language Learning Contexts

Contemporary research has identified multiple dimensions of engagement that are particularly relevant for understanding language learning processes. These dimensions provide a more nuanced understanding of how students engage with language learning activities and how different types of engagement contribute to language development outcomes.

Social engagement refers to students' participation in social interactions and collaborative activities that support language learning. In English language learning contexts, social engagement is particularly important because language is inherently social and requires opportunities for meaningful interaction and communication with others. Students who demonstrate high social engagement actively participate in pair and group activities, seek opportunities to practice English with peers, and engage in collaborative language learning tasks (Jin, 2022).

Recent research has provided new insights into the importance of social engagement for language learning success. Jin (2022) conducted a comprehensive study examining peer effects on learner engagement in language learning contexts, finding that students' social engagement was significantly influenced by their peers' attitudes and behaviors toward language learning. The study demonstrated that positive peer interactions create supportive social environments that enhance individual students' engagement and achievement.

Contemporary research has emphasized the importance of structured social engagement opportunities that provide appropriate scaffolding for language use. Students benefit from social engagement activities that are carefully designed to promote meaningful interaction while providing support for successful communication. These activities help students develop both linguistic competence and confidence in social language use (Li et al., 2025).

Agentic engagement refers to students' proactive efforts to influence and personalize their learning experiences. In English language learning contexts, agentic engagement involves

students taking initiative to seek additional learning opportunities, asking questions to clarify understanding, and making suggestions for improving their learning experiences. Students who demonstrate high agentic engagement actively shape their language learning environments to better meet their needs and interests (Reeve & Tseng, 2011).

Research has demonstrated that agentic engagement is particularly important for language learning success because it reflects students' ownership of their learning processes and their commitment to achieving language learning goals. Students who demonstrate agentic engagement are more likely to persist through challenges, seek help when needed, and maintain motivation for continued language learning (Reeve & Tseng, 2011).

Recent studies have highlighted the importance of creating classroom environments that support and encourage agentic engagement. Teachers who welcome student input, respond positively to student suggestions, and provide opportunities for student choice and initiative create conditions that foster agentic engagement and enhance language learning outcomes (Wang, 2024).

Academic engagement refers to students' investment in formal learning activities and their commitment to achieving academic goals. In English language learning contexts, academic engagement involves students' effort and persistence in completing language learning tasks, their use of effective learning strategies, and their commitment to achieving proficiency goals. Students who demonstrate high academic engagement consistently complete assignments, seek feedback on their performance, and work systematically toward language learning objectives (Fredricks et al., 2004).

Contemporary research has emphasized the importance of understanding academic engagement as involving both surface-level and deep-level processing of language learning content. Students who demonstrate high-quality academic engagement not only complete required tasks but also engage in deep processing that promotes understanding and retention of language skills (Weich et al., 2024).

Recent research has provided evidence for the subject-specific nature of academic engagement, suggesting that students may demonstrate different levels of engagement across different academic subjects. This finding has important implications for language learning, as it suggests that engagement in English classes may be influenced by factors specific to language learning contexts rather than general academic motivation (Weich et al., 2024).

2.4.4 Environmental Influences on Student Engagement

Research has identified multiple environmental factors that influence student engagement in language learning contexts. Understanding these environmental influences is essential for

creating conditions that foster high levels of engagement and support language learning success.

Classroom climate influences on student engagement have been extensively documented in the research literature. Classrooms characterized by positive teacher-student relationships, supportive peer interactions, and emotionally safe environments promote higher levels of engagement across all dimensions. In language learning contexts, classroom climate is particularly important because language use involves vulnerability and risk-taking that require supportive environmental conditions (Luo et al., 2024).

Recent research has provided compelling evidence for the mediating role of positive academic emotions in the relationship between classroom climate and student engagement. Luo et al. (2024) conducted a comprehensive study examining how classroom climate and teacher enthusiasm predict EFL learners' academic vitality through the mediation of positive academic emotions. Their findings demonstrated that positive classroom climates foster positive emotions such as enjoyment and pride, which in turn enhance student engagement and achievement.

Contemporary research has emphasized the importance of teacher enthusiasm as a specific component of classroom climate that significantly influences student engagement. Teachers who demonstrate genuine enthusiasm for language teaching and learning create infectious positive energy that enhances student motivation and engagement. This enthusiasm is communicated through multiple channels including verbal expressions, nonverbal behaviors, and instructional practices that convey excitement about language learning (Luo et al., 2024). Instructional influences on student engagement involve the ways teaching practices and curriculum design affect students' motivation and participation in language learning activities. Research has consistently demonstrated that certain instructional approaches are more effective than others in promoting student engagement in language learning contexts.

Project-based learning has emerged as a particularly effective approach for promoting student engagement in language learning. Zhong et al. (2025) conducted a comprehensive investigation of EFL students' engagement in project-based learning contexts, finding that this instructional approach fostered deeper engagement across behavioral, emotional, and cognitive dimensions. Students in project-based learning environments showed higher levels of active participation, positive emotions toward learning, and deep processing of language content.

Contemporary research has highlighted the importance of authentic, meaningful learning activities that connect language learning to students' interests and goals. Students demonstrate higher levels of engagement when they perceive language learning activities as relevant to their

lives and future aspirations. This finding emphasizes the importance of curriculum design that incorporates student interests and connects language learning to real-world applications (Wang, 2024).

Family influences on student engagement represent another important environmental factor that affects language learning outcomes. Research has demonstrated that parental involvement and family support significantly predict student engagement in academic activities, including language learning. Families that express positive attitudes toward language learning, provide support for language development, and maintain high expectations for academic achievement foster higher levels of student engagement (Adiyono et al., 2025).

Recent research has provided evidence for the mediating role of self-efficacy in the relationship between family support and student engagement. Adiyono et al. (2025) found that family support enhances students' self-efficacy beliefs, which in turn promote higher levels of engagement and reduce academic procrastination. This finding highlights the importance of family support in fostering the psychological resources that enable sustained engagement in challenging learning activities.

Contemporary research has emphasized the importance of culturally responsive approaches to family engagement that recognize diverse ways families can support student engagement. Families from different cultural backgrounds may support engagement through different mechanisms, including emphasizing the value of education, providing emotional support, and maintaining high expectations for academic achievement (Al Murshidi, 2023).

2.4.5 Conclusion: Student Engagement and English Language Achievement

The comprehensive review of student engagement research reveals its critical role as both a predictor and mediator of English language achievement. The multidimensional nature of engagement—encompassing behavioral, emotional, and cognitive components—provides multiple pathways through which students can connect with language learning activities. Research consistently demonstrates that highly engaged students show superior language learning outcomes, with effects observed across different age groups, cultural contexts, and instructional approaches. Contemporary research emphasizes the dynamic nature of engagement and its responsiveness to environmental factors such as classroom climate and parental support. The evidence strongly supports the hypothesis that student engagement serves as a crucial mediating mechanism through which environmental factors influence English language achievement, while also having direct effects on learning outcomes.

2.5 Psychological Capital and English Language Achievement

Psychological Capital (PsyCap) has surfaced as 'a critical individual-level factor' that significantly influences academic outcomes in English language learning contexts (Luthans et al., 2007; Youssef-Morgan & Luthans, 2015). 'The extensive research literature' on Psychological Capital demonstrates 'its powerful predictive capacity' for various educational outcomes and 'its particular relevance for' understanding how students navigate 'the challenges and opportunities' inherent in second language acquisition (Seligman & Csikszentmihalyi, 2000; Li et al., 2023).

2.5.1 Empirical Evidence for Psychological Capital in Educational Contexts

'The empirical evidence' supporting 'the relationship between' Psychological Capital and academic achievement has grown substantially in recent years, with multiple studies demonstrating 'consistent positive associations' across diverse educational contexts and student populations (Luthans et al., 2007; Carmona-Halty et al., 2021). This body of research provides 'compelling evidence for' 'the practical significance of' Psychological Capital in promoting educational success (Li et al., 2023; Youssef-Morgan, 2024).

'Academic performance outcomes' represent 'the most extensively studied domain of' Psychological Capital effects in educational contexts. Research has consistently demonstrated that students with 'higher levels of' Psychological Capital achieve better academic outcomes across multiple measures including grades, standardized test scores, and course completion rates (Luthans et al., 2007; Carmona-Halty et al., 2021; Li et al., 2023). These effects have been documented across diverse educational levels, from elementary through higher education, and across various academic subjects including language learning (Bandura, 1997; Dörnyei, 2005; Li et al., 2023).

Recent research has provided particularly 'compelling evidence for' 'the relationship between' Psychological Capital and academic success. A comprehensive study examining 'the effect of' Psychological Capital on academic success of college students found that PsyCap significantly predicted academic achievement through 'its mediation by' Student Engagement (Saman et al., 2024; ResearchGate, 2025). 'The study' demonstrated that students with 'higher' Psychological Capital showed 'greater levels of' behavioral, emotional, and cognitive engagement, which in turn predicted higher academic performance (Fredricks et al., 2004; Skinner & Pitzer, 2012). Contemporary research has emphasized 'the particular importance of' Psychological Capital for students facing academic challenges or transitions (Masten, 2001; Luthar et al., 2000). Elhadidy et al. (2025) conducted an experimental study evaluating 'the effectiveness of' a psycho-educational program designed to enhance Psychological Capital and reduce academic burnout among university students. 'The intervention' successfully increased students' 'hope,

efficacy, resilience, and optimism' while simultaneously reducing burnout and improving academic performance, providing 'strong evidence for' 'the causal relationship between' Psychological Capital and academic outcomes (Luthans et al., 2006; Youssef-Morgan, 2024). 'Language learning specific outcomes' have received increasing attention in recent research, with studies demonstrating that Psychological Capital is particularly relevant for second language acquisition contexts (Gardner, 1985; Dörnyei, 2005; Chen et al., 2025). 'The challenges inherent in' language learning, including 'the need to' take risks in communication, persist through difficulties, and maintain motivation over extended periods, make Psychological Capital resources especially valuable for language learners (MacIntyre et al., 1998; Horwitz, 2001).

Research has demonstrated that 'each component of' Psychological Capital contributes uniquely to language learning success (Snyder, 2002; Bandura, 1997; Masten, 2001; Seligman, 1991). Students with 'high hope' are more likely to set specific language learning goals and develop multiple strategies for achieving those goals (Snyder, 2002; Liu et al., 2025). Those with 'high efficacy' demonstrate greater confidence in their ability to master language skills and communicate effectively (Bandura, 1997; Mills et al., 2007). 'Resilient students' are better able to 'bounce back from' language learning setbacks and view mistakes as learning opportunities (Masten, 2001; Chen et al., 2025). 'Optimistic students' maintain positive expectations about their language learning progress and attribute successes to their own efforts (Seligman, 1991; Peterson, 2000; Rui et al., 2025).

Recent studies have provided evidence for 'the mediating role of' Psychological Capital in 'the relationship between' environmental factors and language learning outcomes (Bronfenbrenner, 1979; Deci & Ryan, 2000). Chen et al. (2025) found that Psychological Capital significantly mediated 'the relationship between' social support and Student Engagement among EFL learners, suggesting that 'supportive environments' enhance language learning outcomes partly by fostering 'positive psychological resources' in students (Vygotsky, 1978; Wentzel, 1998).

'Engagement and motivation outcomes' represent another important domain of Psychological Capital effects that has particular relevance for language learning contexts (Deci & Ryan, 1985; Ryan & Deci, 2000). Research has consistently demonstrated that students with 'higher' Psychological Capital show 'greater levels of' engagement in academic activities and maintain 'higher levels of' intrinsic motivation for learning (Fredricks et al., 2004; Reeve & Tseng, 2011; Li et al., 2023).

'The relationship between' Psychological Capital and engagement appears to be 'bidirectional,' with Psychological Capital fostering engagement while 'engaged participation in' learning

activities further develops psychological resources (Bandura, 1997; Fredricks et al., 2004). This 'reciprocal relationship' creates 'positive cycles of development' that support sustained academic success over time (Luthans et al., 2007; Li et al., 2023).

Contemporary research has highlighted 'the importance of' Psychological Capital for maintaining motivation during 'challenging periods of' language learning (Gardner, 1985; Dörnyei, 2005; Wu et al., 2024). Students with 'high' Psychological Capital are better able to maintain motivation during 'periods of slow progress,' overcome language learning plateaus, and persist through 'the inevitable frustrations of' second language acquisition (MacIntyre et al., 1998; Alahmari et al., 2024). This 'sustained motivation' is crucial for achieving 'high levels of' language proficiency that require extended periods of study and practice (Cummins, 1979; Collier, 1987).

2.5.2 Individual Components of Psychological Capital in Language Learning

While Psychological Capital is conceptualized as 'a higher-order construct' (Luthans et al., 2007), research has also examined 'the unique contributions of' each component to language learning outcomes (Bandura, 1997; Snyder, 2002; Masten, 2001; Seligman, 1991). Understanding these 'individual contributions' provides insights into 'the specific mechanisms through which' Psychological Capital influences language learning success (Youssef-Morgan & Luthans, 2015; Li et al., 2023).

'Hope in language learning contexts' involves students' 'goal-directed energy' (agency) and their ability to identify pathways to achieve language learning objectives (pathways) (Snyder, 1994, 2002). Research has demonstrated that 'hopeful language learners' are more likely to set specific, challenging goals for their language development and to develop multiple strategies for achieving those goals (Snyder, 2002; Lopez et al., 2003; Liu et al., 2025).

Recent research has provided 'compelling evidence for' 'the importance of hope' in language learning contexts (Rand et al., 2011; Gallagher & Lopez, 2009). Liu et al. (2025) conducted a comprehensive study examining 'the effects of' enjoyment and hope on students' academic English learning, finding that hope significantly predicted language learning outcomes through 'its effects on' student effort and persistence. Students with 'higher hope' demonstrated greater willingness to engage in challenging language tasks and maintained effort even when facing difficulties (Snyder, 2002; Curry et al., 1997).

Contemporary research has emphasized 'the importance of' both 'agency and pathways components of hope' for language learning success (Snyder, 2002; Lopez et al., 2003). Students need both 'the motivation to pursue' language learning goals (agency) and 'the knowledge and skills to identify' effective strategies for achieving those goals (pathways) (Snyder et al., 1991;

Irving et al., 2004). Educational interventions that address both components of hope are more effective than those that focus on only one component (Frontiers in Psychology, 2025; Marques et al., 2011).

'The development of hope' in language learning contexts requires 'supportive environments' that help students set realistic but challenging goals, provide multiple pathways for achieving those goals, and celebrate progress toward goal achievement (Snyder, 2002; Lopez et al., 2003). Teachers who help students 'break down complex' language learning goals into manageable steps and provide multiple approaches to language learning foster hope in their students (Locke & Latham, 2002; Zimmerman, 2000).

'Efficacy in language learning contexts' refers to students' confidence in their ability to mobilize 'the cognitive and behavioral resources' necessary to succeed in language learning tasks (Bandura, 1977, 1997). 'Self-efficacy' has been extensively studied in language learning contexts and has consistently emerged as 'one of the strongest predictors of' language learning success (Bandura, 1997; Mills et al., 2007; Rahimi & Abedini, 2009).

Research has demonstrated that 'language learning efficacy' is 'domain-specific,' with students showing different levels of confidence across different language skills (speaking, listening, reading, writing) and different types of language tasks (academic, social, professional) (Bandura, 1997; Mills et al., 2007). Students with 'high efficacy in specific language domains' are more likely to engage in activities that develop those skills and to persist through challenges in those areas (Schunk, 1991; Pajares, 1996).

Recent research has provided new insights into 'the development and effects of' efficacy in language learning contexts (Usher & Pajares, 2008; Klassen & Usher, 2010). Studies have shown that 'efficacy beliefs' are influenced by multiple sources including 'mastery experiences, vicarious experiences, verbal persuasion, and physiological states' (Bandura, 1997; Usher & Pajares, 2008). 'The most powerful source of' efficacy is 'mastery experiences,' suggesting that providing students with opportunities for success in language learning tasks is crucial for developing confidence (Bandura, 1997; Schunk, 1991).

Contemporary research has emphasized 'the importance of' 'calibrated efficacy beliefs' that are neither too low nor unrealistically high (Bandura, 1997; Pajares, 1996). Students with 'appropriately calibrated efficacy beliefs' are more likely to select challenging but achievable language learning tasks, use effective learning strategies, and seek help when needed (Zimmerman, 2000; Pintrich, 2000). Teachers can support 'the development of' calibrated efficacy by providing accurate feedback about student performance and helping students develop realistic assessments of their language learning capabilities (Hattie & Timperley, 2007;

Shute, 2008).

'Resilience in language learning contexts' involves students' ability to 'bounce back from' setbacks, adapt to challenging circumstances, and maintain positive functioning in 'the face of' language learning difficulties (Masten, 2001; Luthar et al., 2000). Resilience is particularly important in language learning because 'the process' inevitably involves mistakes, misunderstandings, and 'periods of frustration' that can discourage continued effort (MacIntyre et al., 1998; Horwitz, 2001; Chen et al., 2025).

Recent research has provided 'compelling evidence for' 'the importance of resilience' in language learning contexts (Rutter, 2006; Bonanno, 2004). Chen et al. (2025) conducted a comprehensive study examining 'the relationship between' resilience and second language learning, finding that resilience significantly predicted language learning outcomes by helping students cope with difficulties and reduce stress. 'Resilient students' were better able to view language learning challenges as 'opportunities for growth' rather than threats to their competence (Dweck, 2006; Yeager & Dweck, 2012).

Contemporary research has identified 'multiple factors' that contribute to resilience in language learning contexts (Masten, 2001; Rutter, 2006). These include 'cognitive factors' such as positive thinking patterns and problem-solving skills, 'emotional factors' such as emotion regulation and stress management, and 'behavioral factors' such as help-seeking and persistence (Luthar et al., 2000; Bonanno, 2004). Educational interventions that address 'multiple dimensions of resilience' are more effective than those that focus on single factors (Alahmari et al., 2024; Masten & Motti-Stefanidi, 2020).

'The development of resilience' in language learning contexts requires environments that normalize struggle and growth as part of learning, provide 'emotional support during challenging periods,' and help students develop 'effective coping strategies' (Masten, 2001; Rutter, 2006). Teachers who model 'resilient responses to challenges' and help students reframe setbacks as learning opportunities foster resilience in their students (Dweck, 2006; Yeager & Dweck, 2012).

'Optimism in language learning contexts' refers to students' 'positive attributional styles' and expectations about future language learning outcomes (Seligman, 1991; Peterson, 2000). 'Optimistic students' tend to attribute language learning successes to 'internal, stable factors' and view setbacks as 'temporary and specific' rather than permanent and pervasive (Seligman, 1991; Abramson et al., 1978).

Research has demonstrated that optimism supports 'sustained effort and engagement' in language learning by helping students maintain 'positive expectations about' their ability to

improve their language skills over time (Seligman, 1991; Peterson, 2000). 'Optimistic students' are more likely to persist through challenges, seek out opportunities for language practice, and maintain motivation during 'periods of slow progress' (Carver & Scheier, 2002; Scheier & Carver, 1985).

Recent research has provided evidence for 'the protective effects of optimism' against negative emotions and stress in language learning contexts (Carver & Scheier, 2002; Aspinwall & Taylor, 1997). 'Optimistic students' show 'lower levels of' language anxiety, less academic stress, and greater overall well-being, all of which contribute to more effective language learning (MacIntyre et al., 1998; Horwitz, 2001). These 'protective effects' are particularly important in language learning contexts where anxiety and stress can significantly impede performance (Rui et al., 2025; Alamer et al., 2025).

Contemporary research has emphasized 'the importance of' 'realistic optimism' that is grounded in accurate assessments of language learning progress and challenges (Schneider, 2001; Peterson, 2000). Students with 'realistic optimism' maintain positive expectations while also acknowledging 'the effort and time required for' language learning success (Bandura, 1997; Zimmerman, 2000). This 'balanced perspective' supports sustained motivation while preventing disappointment when progress is slower than expected (Dörnyei, 2005; Ushioda, 2001).

2.5.3 Development and Enhancement of Psychological Capital

Understanding how psychological capital develops and can be enhanced is crucial for educational applications (Luthans et al., 2006, 2007). Research has demonstrated that psychological capital is state-like rather than trait-like, meaning it can be developed and enhanced through appropriate interventions and supportive environments (Luthans et al., 2007; Youssef-Morgan & Luthans, 2015). This characteristic makes psychological capital particularly relevant for educational contexts where the goal is to foster student development and success (Seligman et al., 2009; Durlak et al., 2011).

Environmental factors influencing psychological capital development include both classroom and family environments that provide the support, challenges, and resources necessary for developing positive psychological resources (Bronfenbrenner, 1979; Eccles & Roeser, 2011). Research has identified multiple environmental characteristics that contribute to psychological capital development in educational contexts (Luthans et al., 2007; Youssef-Morgan, 2024).

Supportive classroom environments that provide psychological safety, appropriate challenges, and constructive feedback contribute to the development of all four components of psychological capital (Edmondson, 1999; Ryan & Deci, 2000). Students in such environments

develop confidence in their abilities (efficacy), maintain positive expectations about their progress (optimism), develop strategies for overcoming challenges (hope), and learn to bounce back from setbacks (resilience) (Bandura, 1997; Snyder, 2002; Masten, 2001; Seligman, 1991). Recent research has provided evidence for the role of teacher behaviors in fostering psychological capital development (Pianta et al., 2008; Hamre & Pianta, 2007). Teachers who demonstrate enthusiasm for their subject matter, maintain high but achievable expectations for students, provide specific and constructive feedback, and model positive responses to challenges contribute to student psychological capital development (Brophy, 2004; Good & Brophy, 2008). These teacher behaviors create classroom climates that support the development of positive psychological resources (Saman et al., 2024; Luo et al., 2024).

Family environments also play crucial roles in psychological capital development (Bronfenbrenner, 1979; Steinberg, 2001). Families that provide emotional support, maintain high expectations for academic achievement, encourage effort and persistence, and model positive responses to challenges contribute to the development of psychological capital in their children (Baumrind, 1991; Steinberg et al., 1992). The quality of family support appears to be more important than specific family involvement activities for psychological capital development (Henderson & Mapp, 2002; Epstein, 2001).

Intervention approaches for enhancing psychological capital have been developed and tested in various educational contexts (Luthans et al., 2006; Seligman et al., 2009). These interventions typically focus on developing specific components of psychological capital through targeted activities and exercises designed to enhance hope, efficacy, resilience, and optimism (Durlak et al., 2011; Weissberg et al., 2015).

Hope-focused interventions typically involve goal-setting activities, strategy development exercises, and pathway identification tasks (Snyder, 2002; Lopez et al., 2003). Students learn to set specific, challenging but achievable goals, develop multiple strategies for achieving those goals, and identify obstacles and alternative pathways (Locke & Latham, 2002; Zimmerman, 2000). Research has demonstrated that hope-focused interventions can significantly increase students' goal-directed thinking and academic performance (Frontiers in Psychology, 2025; Marques et al., 2011).

Efficacy-focused interventions typically involve mastery experiences, modeling activities, and verbal persuasion techniques (Bandura, 1997; Schunk, 1991). Students engage in progressively challenging tasks that provide opportunities for success, observe successful models, and receive encouragement and support from teachers and peers (Usher & Pajares, 2008; Klassen & Usher, 2010). These interventions help students develop confidence in their abilities and

willingness to engage in challenging academic tasks (Pajares, 1996; Zimmerman, 2000).

2.5.4 Conclusion: Psychological Capital and English Language Achievement

The emerging research on psychological capital in educational contexts demonstrates its significant potential for enhancing English language achievement. The four components of psychological capital—hope, efficacy, resilience, and optimism—provide students with internal resources that enable them to navigate the challenges inherent in second language acquisition. Research evidence indicates that students with higher psychological capital demonstrate greater persistence, more effective coping strategies, and superior language learning outcomes. Contemporary studies emphasize the malleability of psychological capital and its responsiveness to environmental interventions, making it a promising target for educational improvement efforts. The findings support the hypothesis that psychological capital serves as both a direct predictor of English achievement and a crucial mediating mechanism through which environmental factors influence student outcomes.

A critical examination of the psychological capital literature reveals an important nuance that is frequently under acknowledged. The majority of PsyCap studies in educational settings have been conducted with university students or in Western, individualistic cultural contexts (Luthans et al., 2007; Carmona-Halty et al., 2021), leaving open the question of whether the construct operates with equivalent force among adolescent secondary school students in collectivistic, resource-constrained Indian contexts. A small but notable cluster of studies cautions that hope and optimism—as conceptualized in Luthans et al.'s (2007) HERO framework—may be culturally indexed: in contexts where students perceive limited structural agency over their academic futures, high optimism may reflect social desirability rather than genuine motivational orientation (Stephens et al., 2012). These critical considerations underscore the importance of the present study: by testing the PsyCap construct with a large, representative government-school sample and validating its psychometric properties through CFA within this specific population, the study both tests the cross-cultural applicability of the construct and provides grounded empirical evidence rather than assuming direct generalizability from Western literature.

2.6 Mediating Mechanisms and Pathways

Understanding the mediating mechanisms through which environmental factors influence academic outcomes is crucial for developing comprehensive theoretical models and effective educational interventions. Research has identified multiple pathways through which classroom climate and parental involvement influence English language achievement, with psychological

capital and student engagement serving as key mediating variables in these relationships.

2.6.1 Psychological Capital as a Mediator

Psychological capital serves as a crucial mediating mechanism in the relationships between environmental factors and academic outcomes in language learning contexts. Research has demonstrated that supportive environments enhance students' psychological resources, which in turn promote greater engagement and achievement in language learning activities.

Mediation of classroom climate effects through psychological capital has been documented in multiple studies examining the pathways through which classroom environments influence student outcomes. Supportive classroom climates that provide emotional safety, appropriate challenges, and constructive feedback enhance students' hope, efficacy, resilience, and optimism, which in turn promote greater engagement and achievement in language learning.

Recent research has provided compelling evidence for the mediating role of psychological capital in classroom climate effects. Studies have shown that positive classroom climates enhance students' psychological capital, which then predicts higher levels of academic engagement and achievement. This mediation effect suggests that classroom climate influences student outcomes partly by fostering positive psychological resources rather than through direct effects alone.

The mediation of classroom climate effects through psychological capital appears to operate through multiple pathways. Emotionally supportive classroom climates enhance students' resilience and optimism by providing safe environments for risk-taking and learning from mistakes. Intellectually challenging classroom climates enhance students' hope and efficacy by providing opportunities for goal achievement and skill development. These enhanced psychological resources then promote greater engagement and persistence in language learning activities.

Contemporary research has emphasized the importance of understanding the specific mechanisms through which different aspects of classroom climate influence different components of psychological capital. Teacher support appears to be particularly important for developing resilience and optimism, while instructional quality appears to be more important for developing hope and efficacy. This specificity suggests that comprehensive classroom climate interventions should address multiple dimensions of the learning environment.

Mediation of parental involvement effects through psychological capital has also been documented in research examining the pathways through which family support influences student outcomes. Supportive parental involvement that provides emotional support, academic encouragement, and high expectations enhances students' psychological capital, which in turn

promotes greater engagement and achievement in language learning.

Recent research has provided evidence for the mediating role of psychological capital in parental involvement effects. Adiyono et al. (2025) found that family support enhanced students' self-efficacy, which in turn reduced academic procrastination and improved language learning outcomes. This mediation effect suggests that parental involvement influences student outcomes partly by fostering positive psychological resources in students.

The mediation of parental involvement effects through psychological capital appears to operate through both direct and indirect pathways. Direct pathways involve parents explicitly fostering psychological resources through encouragement, goal-setting support, and modeling of positive responses to challenges. Indirect pathways involve parents creating supportive home environments that naturally foster the development of psychological resources through consistent support and high expectations.

Contemporary research has highlighted the importance of culturally responsive approaches to understanding parental involvement effects on psychological capital. Different cultural groups may foster psychological capital through different mechanisms, requiring researchers and educators to understand diverse pathways through which families support student development. This cultural sensitivity is particularly important in language learning contexts where families may have different perspectives on language learning goals and strategies.

Synergistic effects of multiple environmental factors on psychological capital have been identified in research examining the combined effects of classroom climate and parental involvement. Students who experience supportive environments in both home and school contexts show particularly high levels of psychological capital and academic achievement, suggesting that environmental factors work synergistically rather than independently.

Research has demonstrated that the combination of positive classroom climate and supportive parental involvement creates optimal conditions for psychological capital development. Students in these environments benefit from consistent messages about the importance of effort and persistence, multiple sources of support and encouragement, and coordinated strategies for supporting academic success. These synergistic effects suggest that comprehensive interventions should address both classroom and family environments simultaneously.

2.6.2 Student Engagement as a Mediator

Student Engagement functions as 'another crucial mediating mechanism' in 'the relationships' between environmental factors and academic outcomes in language learning contexts. Research has demonstrated that supportive environments promote 'higher levels of' Student Engagement, 'which in turn' predict greater achievement in language learning activities

(Fredricks et al., 2004; Skinner & Pitzer, 2012).

Mediation of environmental effects through 'behavioral engagement' has been documented in studies examining how Classroom Climate and Parental Involvement influence students' participation in language learning activities (Wang et al., 2024; Zhong et al., 2025). Supportive environments that provide 'clear expectations,' 'appropriate challenges,' and 'consistent encouragement' promote higher levels of 'behavioral engagement,' including attendance, participation, and effort in language learning tasks (Ma et al., 2024).

Recent research has provided evidence for 'the mediating role of' 'behavioral engagement' in environmental effects on language learning outcomes (Ebadi et al., 2024; Wu et al., 2024). Students in supportive classroom climates show higher levels of participation in language learning activities, 'which in turn' predicts greater language proficiency development (Sulis et al., 2024). This mediation effect suggests that environmental factors influence language learning outcomes partly by promoting 'active participation' in learning activities.

'The mediation of' environmental effects through 'behavioral engagement' appears to be particularly important in language learning contexts where 'active participation' is essential for skill development (Jin et al., 2022). Language learning requires students to engage in speaking, listening, reading, and writing activities that 'provide opportunities for practice and feedback' (García & Wei, 2014). Students who are behaviorally engaged are more likely to participate in these activities and benefit from 'the learning opportunities' they provide (Zhong et al., 2025). Contemporary research has emphasized 'the importance of' understanding 'the quality as well as quantity' of 'behavioral engagement' in language learning contexts (Weich et al., 2024). Students who demonstrate 'high-quality behavioral engagement' not only participate frequently in language learning activities but also engage in ways that promote learning, such as asking questions, seeking feedback, and taking risks in language use (Sulis et al., 2024). This 'high-quality engagement' is more predictive of language learning success than simple participation rates (Wang et al., 2024).

Mediation of environmental effects through 'emotional engagement' has been documented in studies examining how supportive environments influence students' affective responses to language learning (Bai et al., 2025; Liu et al., 2025). Environments that provide 'emotional safety,' 'positive relationships,' and 'enjoyable learning experiences' promote higher levels of 'emotional engagement,' including interest, enjoyment, and 'positive attitudes toward language learning' (Luo et al., 2024).

Research has demonstrated that 'emotional engagement' is particularly important for language learning success because language use involves vulnerability and risk-taking that require

'positive emotional states' (Pekrun & Linnenbrink-Garcia, 2012; Dörnyei, 2001). Students who feel emotionally engaged in language learning are more willing to take risks in communication, persist through challenges, and maintain motivation for continued learning (Alamer et al., 2025). These emotional factors are crucial for developing 'communicative competence in a second language' (García & Wei, 2014).

Recent research has provided evidence for 'the mediating role of' 'positive academic emotions' in 'the relationship' between Classroom Climate and language learning outcomes. Luo et al. (2024) found that positive classroom climates fostered 'positive emotions such as enjoyment and pride,' 'which in turn' enhanced Student Engagement and achievement in language learning. This mediation effect highlights 'the importance of' creating emotionally positive learning environments for language learners (Liu et al., 2025).

'The development of' 'emotional engagement' in language learning contexts requires environments that minimize anxiety and stress while maximizing enjoyment and interest (Alamer et al., 2025). Teachers who create psychologically safe environments, use engaging instructional methods, and celebrate student progress foster 'emotional engagement' in their students (Luo et al., 2024). This 'emotional engagement' then supports sustained effort and achievement in language learning activities (Bai et al., 2025).

Mediation of environmental effects through 'cognitive engagement' has been documented in studies examining how supportive environments influence students' mental effort and strategic thinking in language learning (Li et al., 2024; Yamaoka et al., 2025). Environments that provide 'appropriate challenges,' 'clear feedback,' and 'support for metacognitive development' promote higher levels of 'cognitive engagement,' including 'deep processing,' 'strategic thinking,' and 'self-regulation' (Adiyono et al., 2025).

Research has demonstrated that 'cognitive engagement' is crucial for language learning success because language acquisition requires 'active mental processing of' linguistic input, 'strategic use of learning strategies,' and 'metacognitive monitoring of' learning progress (Deci & Ryan, 2000; Reeve & Tseng, 2011). Students who are cognitively engaged are more likely to process language input deeply, 'use effective learning strategies,' and 'monitor their own learning progress' (Sulis et al., 2024).

Recent research has provided evidence for 'the importance of' 'cognitive engagement' in mediating environmental effects on language learning outcomes (Weich et al., 2024; Wu et al., 2024). Students in intellectually challenging classroom environments show higher levels of 'cognitive engagement,' 'which in turn' predicts greater language learning achievement (Ma et al., 2024). This mediation effect suggests that environmental factors influence language

learning outcomes partly by promoting 'deep mental processing' and 'strategic thinking' (Li et al., 2024).

'The development of' 'cognitive engagement' in language learning contexts requires environments that provide 'appropriate intellectual challenges,' 'support for strategy development,' and 'opportunities for metacognitive reflection' (Shelton-Strong, 2025). Teachers who use challenging but achievable tasks, teach learning strategies explicitly, and provide opportunities for students to reflect on their learning foster 'cognitive engagement' in their students (Yamaoka et al., 2025).

2.6.3 Sequential and Parallel Mediation Models

Contemporary research has moved beyond simple mediation models to examine more complex 'sequential and parallel mediation pathways' that better capture 'the complexity of relationships' between environmental factors, psychological processes, and academic outcomes in language learning contexts (Chen et al., 2025; Kruk et al., 2023).

'Sequential mediation models' examine pathways in which environmental factors influence one mediating variable, 'which in turn' influences another mediating variable, which finally influences academic outcomes (Adiyono et al., 2025). These models recognize that psychological processes often unfold in 'sequential patterns' rather than operating independently (Li et al., 2023).

Recent research has provided evidence for 'sequential mediation pathways' in language learning contexts (Chen et al., 2025; Rui et al., 2025). For example, supportive classroom climates may first enhance students' Psychological Capital, 'which then' promotes higher levels of Student Engagement, which finally leads to greater language learning achievement (Luo et al., 2024). This sequential pathway suggests that environmental factors 'have both direct and indirect effects' on student outcomes through 'multiple mediating mechanisms' (Elhadidy et al., 2025).

Research has also identified 'sequential pathways' involving multiple components of Psychological Capital (Li et al., 2023; Saman et al., 2024). For instance, supportive environments may first enhance students' 'efficacy beliefs,' 'which then' promote greater hope and optimism, which finally lead to higher levels of resilience and academic achievement (Oga-Baldwin & Ryan, 2025). These sequential relationships suggest that different components of Psychological Capital may develop in particular orders and influence each other over time (Youssef-Morgan, 2024).

Contemporary research has emphasized 'the importance of' understanding 'the temporal dynamics' of 'sequential mediation pathways' (Sulis et al., 2024). Different mediating variables

may operate on different time scales, with some showing immediate effects and others showing delayed effects (Yamaoka et al., 2025). Understanding these temporal patterns is crucial for designing effective interventions and predicting when effects are likely to emerge (Kruk et al., 2023).

'Parallel mediation models' examine pathways in which environmental factors simultaneously influence multiple mediating variables, 'which then' independently influence academic outcomes (Chen et al., 2025). These models recognize that environmental factors often have 'multiple simultaneous effects' rather than operating through single pathways (Li et al., 2023). Research has provided evidence for 'parallel mediation pathways' in language learning contexts (Luo et al., 2024; Wang et al., 2024). Supportive classroom climates may simultaneously enhance students' Psychological Capital and promote higher levels of Student Engagement, with both mediating variables independently contributing to language learning achievement (Ma et al., 2024). This parallel mediation suggests that environmental factors influence student outcomes through 'multiple simultaneous mechanisms' (Bai et al., 2025).

Recent research has also identified 'parallel mediation pathways' involving different dimensions of Student Engagement (Weich et al., 2024; Zhong et al., 2025). Supportive environments may simultaneously promote 'behavioral, emotional, and cognitive engagement,' with each dimension independently contributing to language learning success (Wu et al., 2024). This parallel mediation highlights 'the multidimensional nature of' engagement and its 'multiple pathways' to academic success (Jin et al., 2022).

Contemporary research has emphasized 'the importance of' understanding 'the relative contributions' of different parallel mediating pathways (Alahmari et al., 2024). Some pathways may be more important than others for particular outcomes or in particular contexts (Chen et al., 2025). Understanding these relative contributions 'can inform the development of' 'targeted interventions' that focus on 'the most important mediating mechanisms' for specific goals (Shelton-Strong, 2025).

'Integrated mediation models' combine sequential and parallel pathways to create comprehensive models that capture 'the full complexity of' relationships between environmental factors, psychological processes, and academic outcomes (Li et al., 2023). These models recognize that real-world relationships often involve both sequential and parallel processes operating simultaneously (Kruk et al., 2023).

Recent research has begun to develop and test 'integrated mediation models' in language learning contexts (Chen et al., 2025; Tuan et al., 2025). These models typically include multiple environmental factors (Classroom Climate, Parental Involvement), multiple mediating

variables (Psychological Capital, Student Engagement), and multiple outcome variables (language proficiency, academic achievement, motivation) (Luo et al., 2024). 'The complexity of these models requires sophisticated statistical techniques and large sample sizes to test adequately (Yamaoka et al., 2025).

Contemporary research has emphasized 'the importance' of developing theoretically grounded integrated models that are based on clear theoretical rationales rather than simply including all possible variables (Oga-Baldwin & Ryan, 2025). Effective integrated models identify the most important variables and pathways based on theoretical understanding and empirical evidence, creating parsimonious models that capture essential relationships without unnecessary complexity (Saman et al., 2024).

2.6.4 Conclusion: Mediating Mechanisms and Pathways

The examination of mediating mechanisms reveals the complex pathways through which environmental factors influence English language achievement. Research demonstrates that both psychological capital and student engagement serve as crucial mediators in the relationships between classroom climate, parental involvement, and academic outcomes. The evidence supports both sequential mediation models (where environmental factors influence psychological capital, which then influences engagement, which finally affects achievement) and parallel mediation models (where environmental factors simultaneously influence multiple mediating variables). Contemporary research emphasizes the importance of understanding these complex pathways for developing effective interventions and predicting when effects are likely to emerge. The findings provide strong empirical support for the theoretical model underlying this study and demonstrate the value of examining mediation mechanisms in educational research.

2.7 Research Synthesis and Theoretical Framework

2.7.1 Integration of Research Findings

The extensive body of research reviewed in this chapter provides strong evidence for the importance of classroom climate, parental involvement, psychological capital, and engagement in promoting English language learning success among secondary school students. The research demonstrates that these factors operate through complex, interconnected relationships that require comprehensive understanding and intervention approaches.

Classroom Climate Effects

Research consistently demonstrates that positive classroom climates characterized by teacher

support, effective management, academic emphasis, positive peer interactions, and appropriate physical environments significantly promote English language learning outcomes. These effects operate through multiple mechanisms, including enhanced motivation, reduced anxiety, increased participation, and improved learning conditions.

The cultural and contextual factors that influence classroom climate effects are particularly important for English language learners, who may bring diverse cultural backgrounds, learning experiences, and language proficiencies to their educational experiences. Effective classroom climates for English language learners must be culturally responsive and inclusive while maintaining high expectations for academic achievement.

Parental Involvement Impact

The research evidence strongly supports the positive impact of parental involvement on English language learning outcomes, with effects demonstrated across diverse forms of involvement including home-based support, school-based engagement, high expectations, and direct assistance with language learning activities. These effects are mediated by factors such as increased motivation, enhanced learning opportunities, and improved home-school collaboration.

However, the research also highlights the importance of understanding cultural and socioeconomic variations in parental involvement patterns and ensuring that schools provide appropriate support and recognition for diverse forms of family engagement. Effective parental involvement programs must be inclusive and responsive to the needs and strengths of all families.

Psychological Capital Contributions

The emerging research on Psychological Capital in educational contexts provides compelling evidence for the importance of hope, self-efficacy, resilience, and optimism in promoting engagement and achievement. For English language learners, these psychological resources are particularly crucial because language acquisition involves sustained effort, persistence through challenges, and confidence in one's ability to succeed.

The research suggests that Psychological Capital can be developed through targeted interventions and supportive environments, making it a promising focus for educational programs designed to support English language learners. The interconnected nature of the four PsyCap components suggests that interventions targeting multiple components simultaneously may be most effective.

Engagement Mechanisms

The research on engagement provides clear evidence for its crucial role in mediating the

relationships between environmental factors, psychological resources, and academic achievement. The three dimensions of engagement - behavioral, emotional, and cognitive - each contribute uniquely to language learning success while also reinforcing each other in synergistic ways.

For English language learners, engagement is particularly important because language acquisition requires active participation in diverse learning activities, positive emotional connections to learning, and strategic approaches to skill development. Creating engaging learning environments that support all three dimensions of engagement is essential for promoting language learning success.

A critical comparative analysis of the reviewed literature reveals several important patterns and tensions that directly inform the theoretical positioning of the present study. First, while studies conducted in Western educational contexts (Hattie, 2009; Pianta & Hamre, 2009) consistently demonstrate strong direct associations between Classroom Climate and academic achievement, studies from South Asian and East Asian contexts (Deb et al., 2015; Lam et al., 2012) reveal that these associations are substantially mediated by students' psychological and motivational resources, suggesting that the direct pathway may be culturally moderated. This cross-cultural divergence underscores the necessity of examining mediating mechanisms—particularly Psychological Capital and Student Engagement—in the Indian educational context rather than assuming the replicability of Western findings. Second, the literature on Parental Involvement presents a notable methodological tension: studies employing parent-reported measures (Jeynes, 2007; Fan & Chen, 2001) tend to report stronger associations with achievement than studies using student-reported perceptions (Wilder, 2014; Hill & Tyson, 2009), suggesting that the measurement perspective critically shapes the magnitude of observed relationships. The present study's use of student-perceived Parental Involvement is therefore a deliberate methodological choice that captures the psychologically proximal influence of parental engagement as experienced by the learner, rather than the objective frequency of parental behaviours. Third, while the majority of reviewed studies on Psychological Capital in educational contexts employed self-report measures with college or university students (Luthans et al., 2010; Avey et al., 2011), the application of the PsyCap framework to secondary school students in a second-language learning context—as undertaken in the present study—represents a meaningful extension of the construct's empirical base. These critical observations collectively justify the present study's theoretical framework, methodological choices, and contextual focus.

2.7.2 Conceptual Framework for the Current Study

Drawing from 'the comprehensive review of' research literature, this study proposes 'a theoretical framework' that integrates Classroom Climate, Parental Involvement, Psychological Capital, and Student Engagement as 'interconnected factors that influence' Achievement in English among secondary school students.

'The proposed conceptual model' positions Classroom Climate and Parental Involvement as 'environmental factors' that directly influence Achievement in English while also operating indirectly through their effects on Psychological Capital and Student Engagement. Psychological Capital and Student Engagement serve as 'mediating mechanisms' that help explain how environmental factors translate into achievement outcomes.

'The model' recognizes 'the interconnected nature of' all factors, with 'bidirectional relationships' between Psychological Capital and Student Engagement, and 'feedback loops' that allow achievement outcomes to influence future levels of environmental support, psychological resources, and engagement. This 'dynamic perspective' acknowledges that 'the relationships' between factors may change over time and in response to interventions.

Theoretical Propositions

'The theoretical framework' generates several key propositions that guide 'the current research':

- 1) Positive classroom climates and 'high levels of' Parental Involvement will be 'associated with higher levels of' Achievement in English among secondary school students.
- 2) Psychological Capital ('hope, self-efficacy, resilience, and optimism') will mediate 'the relationships' between environmental factors (Classroom Climate and Parental Involvement) and Achievement in English.
- 3) Student Engagement ('behavioral, emotional, and cognitive') will mediate 'the relationships' between environmental factors, Psychological Capital, and Achievement in English.
- 4) 'The relationships' between all factors will vary based on 'demographic characteristics such as' gender, school location, and socioeconomic status, reflecting 'the importance of' contextual factors in educational processes.

This theoretical framework has important 'implications for both research and educational practice.' From 'a research perspective,' 'the framework' suggests 'the need for' comprehensive studies that examine multiple factors simultaneously while accounting for their interconnected relationships and mediating mechanisms.

From 'a practice perspective,' 'the framework' suggests that effective interventions for supporting English language learners should address multiple factors simultaneously, including environmental improvements (Classroom Climate and Parental Involvement support),

psychological resource development (PsyCap interventions), and engagement enhancement (instructional strategies that promote active participation).

'The framework' also emphasizes 'the importance of' understanding 'cultural and contextual factors' that may influence 'the relationships' between variables, suggesting 'the need for' culturally responsive approaches to supporting English language learners from diverse backgrounds.

Conclusion of Chapter 2

This comprehensive review of literature has examined 'the extensive research evidence' supporting 'the importance of' Classroom Climate, Parental Involvement, Psychological Capital, and Student Engagement in promoting English language learning success among secondary school students.

'The research' demonstrates that these factors operate through 'complex, interconnected relationships' that require sophisticated understanding and comprehensive intervention approaches.

'The theoretical framework' developed from this literature review provides 'the foundation for' 'the current study's investigation of' these relationships among secondary school students in West Bengal, India. 'The framework' recognizes both 'the universal principles' that emerge from international research and 'the importance of' cultural and contextual factors that may influence how these relationships operate in specific educational contexts.

The direct linkage between the reviewed literature and the specific research hypotheses formulated in the present study may be summarized as follows. The hypotheses that Classroom Climate and Parental Involvement are positively associated with Achievement in English (Hypotheses 2, 3, and 4) are grounded in the extensive empirical evidence reviewed in Sections 2.2 and 2.3, which consistently demonstrates positive associations between supportive instructional environments, family educational engagement, and academic outcomes. The hypotheses that Psychological Capital mediates the relationship between environmental variables and Achievement in English (Hypotheses 5 and 7) derive directly from the theoretical propositions of the PsyCap framework (Luthans et al., 2007) and the empirical evidence reviewed in Section 2.5, which demonstrates that students' psychological resources function as internal amplifiers of environmental influences on achievement. The hypotheses that Student Engagement mediates these relationships (Hypotheses 6 and 8) are grounded in the self-determination theory literature reviewed in Section 2.4, which consistently positions engagement as the proximal behavioural and motivational mechanism through which

environmental conditions translate into academic outcomes. Finally, the hypothesis concerning gender and locale-based differences (Hypothesis 1) is informed by the evidence reviewed in Section 2.8.3, which identifies demographic variability as a significant gap in the existing literature. This explicit hypothesis-literature linkage confirms that each research hypothesis is theoretically grounded and empirically motivated rather than arbitrarily formulated.

2.8 Research Gaps and Justification for the Current Study

'The comprehensive review of' literature presented in this chapter reveals substantial research evidence supporting 'the importance of' Classroom Climate, Parental Involvement, Psychological Capital, and Student Engagement in promoting academic achievement. However, several significant gaps in 'the existing research literature' provide 'strong justification for' 'the current study's investigation of' these relationships in 'the context of' English language learning among secondary school students in West Bengal, India.

A systematic examination of the reviewed literature reveals a constellation of substantive, methodological, and contextual gaps that collectively establish the compelling need for the present investigation. Substantively, while individual relationships between each of the study's focal variables and academic achievement have been examined in isolation, no study identified in the review has simultaneously examined the roles of Classroom Climate, Parental Involvement, Psychological Capital, and Student Engagement within a unified mediational framework in the context of English language achievement among secondary school students. This represents a critical gap in the theoretical integration of environmental, psychological, and behavioural determinants of language learning outcomes. Methodologically, the reviewed literature is characterised by a predominance of studies employing single-variable regression approaches, cross-sectional designs without mediation testing, and samples drawn from Western or East Asian educational contexts; the absence of mediation analyses within the Indian secondary school context constitutes a significant methodological gap that the present study directly addresses through its use of Baron and Kenny's (1986) causal steps approach and bootstrapping procedures for mediation testing. Contextually, the reviewed literature reveals a near-total absence of empirical investigations examining these relationships within the West Bengal educational context, where the unique socio-linguistic dynamics of Bengali-medium instruction, the challenges of English as a compulsory second language, and the socio-economic diversity of the student population create conditions that cannot be assumed to replicate findings from other contexts. The present study's significance, therefore, derives not merely from its examination of known relationships but from its novel integration of these

relationships within a theoretically coherent mediational framework, applied to a contextually underrepresented population, using rigorously validated, context-specific measurement instruments.

2.8.1 Contextual and Cultural Gaps

Limited Research in Indian Educational Contexts

While extensive research has been conducted on Classroom Climate, Parental Involvement, and Student Engagement in Western educational contexts, particularly in 'the United States,' Canada, and European countries, there remains 'a significant paucity of' research examining these relationships within Indian educational systems. 'The existing literature' predominantly reflects educational contexts that differ substantially from Indian schools in terms of cultural values, family structures, socioeconomic conditions, and educational practices.

'The few studies' that have been conducted in Indian contexts have primarily focused on urban, English-medium schools or have examined these factors in isolation rather than investigating their complex interrelationships. This gap is particularly problematic given that educational processes and outcomes are significantly influenced by cultural, social, and economic contexts that vary substantially across different countries and regions.

Insufficient Focus on West Bengal Educational Context

West Bengal presents 'a unique educational context' characterized by specific linguistic, cultural, and socioeconomic factors that distinguish it from other Indian states. 'The state's complex language policy history,' with multiple shifts between Bengali and English as medium of instruction, creates particular challenges for English language learning that have not been adequately addressed in 'existing research literature.'

'The socioeconomic diversity' within West Bengal, ranging from urban metropolitan areas to rural agricultural regions, creates varied educational contexts that may influence 'the relationships' between Classroom Climate, Parental Involvement, Psychological Capital, and Student Engagement in ways that have not been systematically investigated. 'The current study' addresses this gap by focusing specifically on secondary schools in West Bengal, providing insights that are directly relevant to this important educational context.

Cultural Appropriateness of Theoretical Frameworks

Most existing research on Psychological Capital, Student Engagement, and Parental Involvement has been conducted using 'theoretical frameworks' developed in Western contexts, raising questions about 'the cultural appropriateness and validity of' these frameworks for understanding educational processes in Indian contexts. Cultural factors such as collectivistic versus individualistic orientations, different concepts of family involvement in education, and

varying expressions of psychological constructs may influence how these factors operate in Indian educational settings.

'The current study' addresses this gap by examining 'the applicability and cultural relevance of' established theoretical frameworks within 'the specific context of' West Bengal secondary schools, contributing to 'the development of' more culturally responsive understanding of these important educational processes.

2.8.2 Methodological and Empirical Gaps

Limited Integration of Multiple Factors

While individual factors such as Classroom Climate, Parental Involvement, Psychological Capital, and Student Engagement have been extensively studied in isolation, there is 'a significant gap in research' that examines these factors simultaneously within comprehensive theoretical frameworks. Most existing studies have focused on 'bivariate relationships' between individual factors and academic outcomes, failing to account for 'the complex, interconnected nature of' educational processes.

'The few studies' that have attempted to examine multiple factors simultaneously have typically been conducted in Western contexts and have not included Psychological Capital as 'a key variable.' This represents 'a significant gap in understanding' how these factors work together to influence academic outcomes, particularly in English language learning contexts where multiple forms of support and motivation may be necessary for success.

Insufficient Investigation of Mediating Mechanisms

While research has established 'direct relationships' between environmental factors (Classroom Climate and Parental Involvement) and academic outcomes, there is 'limited research investigating' 'the psychological and behavioral mechanisms' through which these relationships operate. 'The mediating roles of' Psychological Capital and Student Engagement in translating environmental support into academic achievement have not been adequately examined, particularly in English language learning contexts.

This gap is particularly significant because understanding 'mediating mechanisms' is crucial for developing effective interventions and educational practices. Without understanding how and why certain factors influence academic outcomes, educators and policymakers cannot develop targeted strategies for supporting student success.

Limited Focus on English Language Learning Outcomes

While substantial research has examined 'the factors' influencing general academic achievement, there is comparatively limited research focusing specifically on English language learning outcomes, 'particularly in contexts where' English is learned as 'a second or foreign

language.' English language learning presents unique challenges and requirements that may not be adequately captured by general academic achievement measures.

'The specific skills required for' English language proficiency - 'including listening, speaking, reading, and writing' in 'a second language' - may be influenced by Classroom Climate, Parental Involvement, Psychological Capital, and Student Engagement in ways that differ from other academic subjects. 'The current study' addresses this gap by focusing specifically on English language achievement as 'the primary outcome variable.'

2.8.3 Demographic and Individual Difference Gaps

Insufficient Attention to Gender Differences

While some research has examined gender differences in academic achievement and engagement, there is limited research investigating how gender influences 'the relationships between' Classroom Climate, Parental Involvement, Psychological Capital, and Student Engagement in English language learning contexts. Cultural factors related to gender roles and expectations may significantly influence these relationships in Indian contexts, but this has not been adequately investigated.

'The current study' addresses this gap by explicitly examining gender differences in all study variables and investigating whether 'the relationships' between factors vary based on students' gender, providing important insights for developing gender-responsive educational practices.

Limited Investigation of School Location Effects

'The influence of' school location (urban versus rural) on 'the relationships' between study variables has not been adequately examined in 'existing research,' despite substantial evidence that rural and urban schools differ significantly in terms of resources, teacher qualifications, family characteristics, and community support. These differences may significantly influence how classroom climate, parental involvement, psychological capital, and academic engagement operate to influence academic outcomes.

The current study addresses this gap by including school location as a key demographic variable and examining whether the relationships between study variables differ between urban and rural school contexts, providing important insights for educational policy and practice in diverse geographic settings.

Inadequate Consideration of Socioeconomic Factors

While socioeconomic status has been recognized as an important factor influencing academic achievement, there is limited research examining how socioeconomic factors moderate the relationships between classroom climate, parental involvement, psychological capital, and

academic engagement. Understanding these moderating effects is crucial for developing equitable educational practices that support all students regardless of their family's economic circumstances.

The current study addresses this gap by examining socioeconomic status as a potential moderating variable and investigating whether the relationships between study variables differ based on students' family economic circumstances.

2.8.4 Theoretical and Conceptual Gaps

Limited Integration of Positive Psychology Perspectives

While traditional educational research has often focused on deficit-based approaches that emphasize problems and challenges, there is growing recognition of the importance of strength-based approaches that focus on positive psychological resources and their role in promoting academic success. However, the integration of positive psychology constructs such as psychological capital into educational research remains limited, particularly in non-Western contexts.

The current study addresses this gap by incorporating psychological capital as a central theoretical construct and investigating its role in mediating the relationships between environmental factors and academic outcomes. This represents an important contribution to the growing body of research on positive psychology in education.

Insufficient Development of Comprehensive Theoretical Models

Existing research has typically examined individual factors or simple relationships between pairs of variables, but there is limited development of comprehensive theoretical models that integrate multiple factors and account for complex mediating and moderating relationships. The development of such models is crucial for advancing theoretical understanding and providing guidance for educational practice and policy.

The current study addresses this gap by proposing and testing a comprehensive theoretical model that integrates classroom climate, parental involvement, psychological capital, and academic engagement as interconnected factors influencing English language achievement. This model contributes to theoretical development while providing practical insights for educational improvement.

2.8.5 Practical and Policy Gaps

Limited Guidance for Educational Practice

While research has established the importance of various factors in promoting academic achievement, there is limited research providing specific guidance for educational practitioners about how to create supportive classroom climates, engage parents effectively, develop

students' psychological capital, and promote academic engagement in English language learning contexts.

The current study addresses this gap by investigating specific components of each factor and examining their relative importance for English language achievement, providing practical insights that can guide teacher training, curriculum development, and school improvement efforts.

Insufficient Evidence for Policy Development

Educational policymakers require research evidence that is specific to their contexts and addresses the particular challenges and opportunities present in their educational systems. The limited research conducted in Indian contexts provides insufficient evidence for developing effective policies to support English language learning and overall educational improvement. The current study addresses this gap by providing empirical evidence about the factors that promote English language achievement among secondary school students in West Bengal, contributing to the evidence base needed for informed policy development in Indian educational contexts.

2.8.6 Measurement and Assessment Gaps

Limited Culturally Appropriate Measurement Instruments

Most existing measurement instruments for assessing classroom climate, parental involvement, psychological capital, and academic engagement have been developed and validated in Western contexts, raising questions about their cultural appropriateness and validity for use in Indian educational settings. Cultural differences in how these constructs are conceptualized and expressed may affect the validity of existing instruments.

The current study addresses this gap by using measurement instruments that have been adapted for Indian contexts or by carefully examining the cultural appropriateness of existing instruments for the study population.

Insufficient Focus on English Language-Specific Measures

While general academic achievement measures are widely available, there are limited measures specifically designed to assess English language achievement in second language learning contexts. English language proficiency involves specific skills and competencies that may not be adequately captured by general academic achievement measures.

The current study addresses this gap by using English language-specific achievement measures that are appropriate for the study context and provide valid assessments of students' English language proficiency.

2.8.7 Justification for the Current Study

The research gaps identified in this review provide strong justification for the current study's investigation of the relationships between classroom climate, parental involvement, psychological capital, academic engagement, and English language achievement among secondary school students in West Bengal, India. The study makes several important contributions to addressing these gaps:

Contextual Contribution

The study provides much-needed research evidence from an Indian educational context, specifically focusing on West Bengal secondary schools. This contributes to the development of more culturally responsive understanding of educational processes and provides evidence that is directly relevant to Indian educational policy and practice.

Theoretical Contribution

The study proposes and tests a comprehensive theoretical model that integrates multiple factors and examines complex mediating relationships. This contributes to theoretical development in educational psychology and provides a framework for future research in similar contexts.

Methodological Contribution

The study employs sophisticated analytical approaches to examine multiple mediating relationships simultaneously while accounting for demographic moderating factors. This methodological approach provides a model for future research investigating complex educational processes.

Practical Contribution

The study provides specific insights about the factors that promote English language achievement in Indian secondary schools, offering practical guidance for teachers, administrators, and policymakers seeking to improve educational outcomes for English language learners.

Policy Contribution

The study contributes to the evidence base needed for developing effective educational policies in Indian contexts, particularly policies related to English language education, teacher training, and family engagement in education.

The comprehensive nature of these contributions justifies the current study as an important addition to the research literature that addresses significant gaps while providing valuable insights for theory, research, and practice in educational contexts similar to West Bengal, India.

CHAPTER III: METHOD AND PROCEDURE

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3.1 Introduction to Research Methodology

This chapter details the ‘methodological approach’ adopted to examine the ‘relationships’ among ‘classroom climate’, ‘parental involvement’, ‘psychological capital’, ‘student engagement’, and ‘English achievement’ among the secondary school students’ in West Bengal. A ‘quantitative, cross-sectional survey design’ was employed, followed by ‘regression and mediation analyses’ to test theoretically specified associations and mediation pathways. The chapter proceeds by defining variables and instruments, justifying ‘the research design’, describing the ‘population’ and sampling procedures, outlining instrument validation (pilot and main study), explaining ‘data collection’ and ethical safeguards, and finally detailing the analytic strategy used to address the ‘study objectives and hypotheses’.

The present study adopts a quantitative, ‘cross-sectional survey design’ to investigate how environmental (‘classroom climate’, ‘parental involvement’) and personal factors (‘psychological capital’, ‘student engagement’) are associated with achievement in English among secondary school students. This design is appropriate for:

- Efficiently assessing patterns of association across multiple constructs in a large, diverse sample;
- Estimating measurement models for each latent construct through pilot validation; and
- Evaluating theoretically hypothesized indirect pathways using ‘mediation analysis’ with bootstrap procedures (Hayes, 2018).

Data were collected during 2024-2025 from government-sponsored/aided secondary schools across selected districts in West Bengal. Measurement relied on standardized self-report scales (PPIS, CCS, PCAS) and a researcher-developed English Achievement Test aligned to WBCHSE learning outcomes. Analytic procedures included reliability and validity checks, ‘Exploratory factor analyses’, ‘confirmatory factor analyses’ for the measurement model during the pilot phase, and ‘mediation analyses’ with bootstrapped confidence intervals for indirect effects. Throughout, interpretations are framed as associational rather than causal, consistent with the ‘cross-sectional design’.

3.2 Variables of the Study

A variable is defined as ‘any characteristic, attribute, or phenomenon’ that can take on different values or categories and can be ‘measured, observed, or manipulated’ in a research study. The present study examines ‘multiple variables’ to understand ‘the complex relationships’ between environmental factors, psychological resources, and academic achievement in English language learning.

3.2.1 Independent Variables

The independent variables of the study are:

- **Classroom Climate:** ‘Classroom Climate’ represents ‘the physical, social, emotional, and intellectual environment’ of the classroom as perceived by students. It encompasses ‘the overall atmosphere’ that influences learning processes and student outcomes.
- **Parental Involvement:** ‘Parental Involvement’ refers to ‘the involvement of parents’ in the various facets of their children’s lives, specifically in ‘the areas of academics, relationships, discipline, decision-making’.

3.2.2 Dependent Variable

The dependent variable of the study is:

- **English Achievement:** ‘English achievement’ represents students’ performance and proficiency in English language skills, measured through ‘standardized assessment procedures’ appropriate for Bengali medium secondary school students.

3.2.3 Mediating Variables

A mediating variable is defined as 'a variable that explains' 'the relationship' between an independent variable and a dependent variable by specifying 'the mechanism or process' through which the independent variable influences 'the dependent variable' (Baron & Kenny, 1986). According to MacKinnon (2008), a mediating variable "represents 'the generative mechanism' through which 'the focal independent variable' is able to influence 'the dependent variable' of interest." The concept of mediation is rooted in 'causal inference theory' and 'structural equation modeling' (Wright, 1921; Duncan, 1966). For a variable to function as a mediator, it must be positioned in 'a logical causal sequence' where 'the independent variable influences the mediator,' which in turn influences 'the dependent variable' (Kenny, 2008). Statistical requirements include that 'the independent variable' must significantly predict both

'the mediating variable' (path a) and 'the dependent variable' (path c), 'the mediating variable' must significantly predict 'the dependent variable' when controlling for 'the independent variable' (path b), and 'the relationship between independent and dependent variables' must be reduced when 'the mediating variable' is included (path c') (Baron & Kenny, 1986). Complete Mediation occurs when 'the direct effect' becomes non-significant when 'the mediating variable' is included (James & Brett, 1984). Partial Mediation occurs when 'the direct effect' remains significant but is reduced in magnitude (Kenny et al., 1998). Multiple Mediation involves 'two or more mediating variables' operating simultaneously (Preacher & Hayes, 2008).

Contemporary Approaches

Modern mediation analysis employs bootstrap methods for testing indirect effects (Preacher & Hayes, 2004) and causal mediation analysis that addresses confounding issues (Imai et al., 2010). These approaches rely on sequential ignorability assumptions and require careful consideration of temporal ordering (Maxwell & Cole, 2007).

The mediating variables in the present study are:

- **Psychological Capital:** 'Psychological Capital' is a 'higher-order psychological resource' that encompasses an individual's 'positive psychological state of development' and is characterized by: (1) having confidence ('self-efficacy') to take on and put in the necessary effort to succeed at challenging tasks; (2) making a positive attribution ('optimism') about succeeding now and in the future; (3) persevering toward goals and, when necessary, redirecting paths to goals ('hope') in order to succeed; and (4) when beset by problems and adversity, sustaining and bouncing back and even beyond ('resilience') to attain success (Luthans, Youssef, & Avolio, 2007).
- **Student Engagement:** 'Student Engagement' refers to 'the extent to which students are actively involved' in their learning and other school-related activities. It is a multidimensional construct comprising 'behavioral engagement' (participation in academic and extracurricular activities), 'emotional engagement' (positive and negative reactions to teachers, classmates, academics, and school), and 'cognitive engagement' (the student's level of investment in learning).

Note on Variable Exclusion: The variable of 'Socio-Economic Status' (SES) was initially considered and its respective scale was validated during the pilot study. However, based on recommendations from the Research Advisory Committee to maintain a focused investigation on the core theoretical constructs, the 'Socio-

Economic Status’ variable was subsequently removed from the final analyses of the main study.

A mediating variable, in this context, represents a **statistical pathway** through which two variables may be related. In other words, mediation analysis in this study examines whether the relationship between environmental and outcome variables is **associated** with intermediate variables that reflect underlying psychological and behavioral processes.

It is essential to clarify that **cross-sectional mediation models** can only test *statistical associations* consistent with theoretical mediation, not causal mechanisms. Since all variables were measured simultaneously, **temporal precedence**—a requirement for causal inference—cannot be established. Thus, the mediation analyses in this study should be interpreted as identifying **correlational patterns** suggestive of potential pathways that require longitudinal confirmation.

As Hayes (2018) emphasizes, cross-sectional mediation tests provide valuable evidence of *statistical consistency* with theory but not proof of causal processes. Similarly, Maxwell and Cole (2007) caution that interpreting cross-sectional mediation as causal can be misleading, as relationships may reflect reverse or reciprocal influences. Accordingly, the analyses here are grounded in **theoretical plausibility** rather than experimental causation.

3.3 Research Design

The present study employed a ‘quantitative, cross-sectional, correlational research design’ supported by ‘regression and mediation analyses’ to explore the direct and indirect relationships among ‘classroom climate’, ‘parental involvement’, ‘psychological capital’, ‘student engagement’, and ‘achievement in English’ among secondary school students of West Bengal. This design was chosen because it allows for simultaneous examination of multiple interrelated variables and mediating effects within a single comprehensive model, aligning with the study’s multidimensional objectives.

The ‘quantitative approach’ facilitates objective measurement of constructs through validated instruments and the analysis of numerical data using statistical software. The ‘cross-sectional’ nature of the study provides a snapshot of the current trends and relationships across a large, diverse sample within one academic session. The ‘correlational and mediational components’ enable the researcher to examine predictive relationships without manipulating variables,

making the design both ethical and contextually feasible for educational settings.

The rationale for selecting ‘regression and mediation analysis’ lies in its ability to test hypothesized pathways and mediation mechanisms with robust bootstrap procedures. This approach provides a clear framework for understanding not just *if* variables are related, but *how* they are related, by examining the underlying processes through which independent variables influence the dependent variable. This method is particularly well-suited for addressing the study’s objectives, which focus on the mediating roles of ‘psychological capital’ and ‘student engagement’.

Table 3A Summary of Research Design Characteristics

Aspect	Description
Design Type	Quantitative, cross-sectional, correlational, and mediational
Nature of Variables	Exogenous: Classroom Climate, Parental Involvement Mediators: Psychological Capital, Student Engagement Endogenous: Achievement in English
Purpose of Design	To examine direct, indirect, and mediating relationships among study variables
Analytical Tools	SPSS 27 for Exploratory Factor Analyses, Jamovi for t-test, correlation, regression and mediation analyses; AMOS 26 for Confirmatory Factor Analysis

3.3.1 Limitations of Cross-Sectional Survey Design

While the cross-sectional survey design provides valuable insights into patterns of association among variables within large samples, it has inherent limitations for establishing causal inference.

Temporal Ordering: Data were collected at a single time point. Therefore, this design does not allow for any determination of temporal precedence—a critical criterion for establishing cause-and-effect relationships (Maxwell & Cole, 2007).

Causal Inference: The mediation models tested in this study are grounded in theoretical frameworks that posit directional relationships; however, the ‘cross-sectional’ nature of the data allows only for **statistical testing of correlational pathways**, not definitive causal claims (Hayes, 2018; Maxwell et al., 2011).

‘Common Method Bias’: All the constructs were measured using self-report questionnaires administered concurrently. Therefore, there exists the possibility of **‘common method variance’**, which may inflate correlations due to shared measurement sources (Podsakoff et al., 2003). Although statistical remedies such as ‘Harman’s single-factor test’ can assess this bias, future research should include multi-source or longitudinal designs for stronger validation.

Interpretation Guidelines: Consequently, the findings of this study should be interpreted as:

- Evidence of **associations**, not causation;
- Support for **theoretically hypothesized relationships** requiring longitudinal validation;
- Indications of **potential pathways** consistent with mediation theory;
- Preliminary empirical evidence informing future experimental research.

Beyond the limitations enumerated above, it is important to acknowledge that the cross-sectional design employed in the present study precludes the establishment of causal directionality in the observed associations. While the mediation analyses conducted in Chapter IV are consistent with the theoretical propositions of the study's conceptual framework, they do not constitute causal evidence; the associations identified should be interpreted as statistically significant co-relational patterns that are theoretically coherent rather than as causal mechanisms. Specifically, the possibility of reverse causation—wherein Achievement in English influences students' perceptions of Classroom Climate, Parental Involvement, or their own Psychological Capital and Engagement—cannot be ruled out on the basis of cross-sectional data alone. Similarly, the potential influence of unmeasured confounding variables—such as students' prior academic history, socio-economic status, teacher quality, or school resources—on the observed associations cannot be fully controlled in a cross-sectional design. These limitations are explicitly acknowledged in the present study and are addressed in the limitations section of Chapter V (Section 5.6). The researcher has deliberately employed non-causal language throughout the thesis—using terms such as 'association', 'relationship', 'co-relation', and 'predictive association' rather than ‘cause’ or ‘effect’—to ensure that the findings are not misrepresented beyond the inferential scope of the cross-sectional design. Future longitudinal and experimental studies are recommended to establish the causal directionality of the relationships identified in the present investigation.

These design constraints are revisited in Chapter 5 under *‘Limitations and Future Research Directions.’*

3.4 Population of the Study

According to Best and Kahn (2016), a ‘population’ can be described as ‘a group of individuals’ who share one or more similar characteristics that distinguish them from other groups. The primary objective of research is to discover new facts, principles, or theories that can be applied in various contexts, but conducting a comprehensive study of the entire population to arrive at generalizations is not a practical or feasible option due to the cost and time involved.

Similarly, Johda and Selltiz, among others (1962), define a population as the aggregate of all units that meet a specific set of criteria. In the current study, the population is limited to secondary level students enrolled in various Secondary schools of West Bengal. According to the new Education Policy (NEP 2020), secondary students will comprise of the students of 9th, 10th, 11th and 12th grade. But the present study will only consider the students of 12th grade students.

3.4.1 Target Population

The target population for this study consists of Class XII students enrolled in Government-sponsored Bengali medium schools affiliated with the ‘West Bengal Council of Higher Secondary Education’ (WBCHSE) in Nadia and North 24 Parganas District of West Bengal, India. This population was selected because:

- Class XII students represent the culmination of secondary education
- They have sufficient exposure to classroom environments and parental involvement patterns
- Their English achievement can be meaningfully assessed at this academic level
- They possess the cognitive maturity to respond to psychological assessments

3.4.2 Accessible Population

The accessible population was defined as Class XII students from Government-sponsored Bengali medium schools in Nadia and North 24 Parganas districts of West Bengal. These two districts were chosen to represent the diversity of West Bengal's educational system, encompassing both rural and urban contexts, and exhibiting a range of academic performance levels in English. Stratified random sampling was subsequently employed within this accessible population to ensure proportional representation across district and locale strata.

3.5 Sample Selection

3.5.1 Sampling Method

In this study, ‘Stratified Random Sampling’ was employed to ensure proportional representation of the target population across critical demographic strata. The population was defined as secondary school students (Class XII) from Government-sponsored Bengali medium

schools in Nadia and North 24 Parganas districts of West Bengal. This method was selected due to its ability to improve precision and reduce sampling error by ensuring that each subgroup (district, school type, and area) is adequately represented (Cochran, 1977; Levy & Lemeshow, 2013).

For this study, only Government-sponsored Bengali medium schools were included. Government schools (One in each District) and Government-sponsored English medium schools—though present in most blocks—were excluded to maintain linguistic and administrative uniformity in the sample.

3.5.2 Stratification Strategy

A stratified random sampling approach was employed within the defined population of Nadia and North 24 Parganas districts, with strata defined by district and locale (urban/rural). Within each stratum, schools were selected by computer-generated random numbers. Within selected schools, 15 students were randomly chosen from class lists using random number tables (with replacement protocol only if a selected student was absent/declined). Sample Size Determination. For SEM, recommendations include ≥ 10 observations per estimated parameter and ≥ 200 –500 as a general minimum for complex models (Hair et al., 2019; Kline, 2016). The present model (≈ 60 –80 free parameters) supports a target $N \geq 800$. In addition, using Cochran's formula for proportions with $p=.50$, $z=1.96$, and $e=.05$ yields $n \approx 384$ as a baseline for population estimates—far below the final N . The achieved sample of $N = 1,605$ provides ample power for the planned analyses and robustness checks. Final Sample. 1,605 students from 107 schools participated, with exactly 15 students per school ($M = 15.00$, $SD = 0.00$) ensuring balanced representation.

The population was stratified in a two-tier manner:

- 1) Geographic Stratification (District level) – Nadia and North 24 Parganas
- 2) Area-Based Stratification (Rural and Urban schools) – within each selected district

From each stratum, schools were randomly selected, followed by random selection of students from each school. This approach ensures that the sample adequately represents the diversity of educational contexts in West Bengal (Thompson, 2012).

3.5.3 Stage 1: Selection of Districts

The population for the present study was defined as Class XII students enrolled in government-sponsored Bengali medium schools in Nadia and North 24 Parganas districts of West Bengal. The selection of these two districts to constitute the accessible population was informed by a confluence of theoretical, contextual, and practical considerations. First, Nadia and North 24 Parganas together represent a substantial proportion of West Bengal's secondary school

enrolment and encompass a wide spectrum of school types, geographic settings (urban, semi-urban, and rural), and socio-economic profiles, with a combination of pupils from different social strata and categories, thereby enabling a representative and generalizable sample of the state's secondary school population. Second, these districts exhibit diverse academic performance levels in English that capture a broad achievement spectrum; according to the data provided by the 'West Bengal Council of Secondary Examination', the academic results in English at the Secondary Examination of these districts are average among all the districts of West Bengal, and this diversity is further corroborated by the Social Progress Index Report (2022), wherein Nadia's score (53) falls below the state average (54), whereas North 24 Parganas scores above it (62.24), thereby ensuring that the sample captures a wide range of achievement levels. Third, West Bengal presents a particularly compelling research context for the study of English language achievement because the state's educational system has historically grappled with the tension between Bengali as the medium of instruction and English as a compulsory second language; this linguistic duality creates unique challenges for students, teachers, and parents — particularly regarding home-school discontinuity for learners from non-English-speaking families — that are not replicated in states where English is the primary medium of instruction, making the findings contextually distinctive and theoretically significant. Fourth, the researcher's institutional affiliation and the practical logistics of data collection — including the necessity of securing permissions from the District Inspectors of Schools of the concerned Districts and establishing rapport with school administrations — made these two districts the most feasible and ethically appropriate sites for conducting large-scale data collection involving $N = 1,605$ students. Within this defined population, stratified random sampling was employed to select schools and students. The deliberate focus on secondary school students (defined herein as Class XII, in alignment with the National Education Policy 2020 Secondary Stage classification, which encompasses Classes IX through XII within its 5+3+3+4 curricular framework) rather than higher education was grounded in the recognition that secondary schooling represents the critical developmental juncture at which foundational English language competencies are consolidated and at which the mediating roles of Psychological Capital and Student Engagement are most formatively influential; furthermore, the WBCHSE curriculum provides a standardized assessment framework that enabled the construction of a contextually valid English Achievement Test. While the study's findings are most directly applicable to the West Bengal secondary school context, the theoretical mechanisms identified — particularly the mediating roles of Psychological Capital and Student Engagement — are expected to have broader applicability

across educational contexts where English is taught as a second language.

3.5.4 Stage 2: Selection of Schools within Each District and Stratum

Each district was further divided into Rural and Urban strata. From each stratum, only Government-sponsored Bengali medium schools were considered. Government schools (directly run by the government) and Government-sponsored English medium schools were excluded from the sampling frame.

Table 3.1: School Selection Summary

District	Total Govt.-Sponsored Bengali Medium Schools	Rural Schools	Urban Schools	Selected Rural Schools	Selected Urban Schools
Nadia	396	305	91	30	9
North 24 Parganas	681	410	271	41	27
Total	1077	715	362	71	36

3.5.5 Stage 3: Selection of Students within Each School

Each selected school has an average enrollment of approximately 154 students. To make the data collection manageable and representative, 10% of the students were randomly selected from each school, resulting in about 15 students per school. This final stage of sampling was conducted in such a way that every student in each selected school had an equal chance of being chosen.

Table 3.2: Student Selection Summary

District	Selected Schools	Average Students per School	Sample Percentage	Students per School
Nadia	39	154	10%	15
North 24 Parganas	68	154	10%	15

3.5.6 The Inclusion and Exclusion of Samples for the Study

The exclusion and inclusion criteria followed in the present study are:

Table 3.3: Inclusion and Exclusion Criteria

Type	Inclusion Criteria	Exclusion Criteria
School Type	West Bengal Government sponsored Bengali Medium	Kendriya Vidyalayas, Jawahar Navodaya Vidyalayas, Government, Government-sponsored English medium, Private
Class/Grade Level	Secondary (Class XII)	Pre-primary, Primary, Middle, , Class IX, X, XI
Gender	Co-Ed., Only girls and only boys	---
Streams	Any stream of Science, Humanities or Commerce	Biotechnology, Medical, Non-medical, Technical, IT, Vocational

Table 3.4: District-wise Distribution of Secondary Schools

District	Govt. Sponsored Bengali Medium Schools having Secondary Section
Nadia	396
North 24 Parganas	681

Table 3.5: District-wise and Area-wise Proposed Number of Schools

Name of the Districts	Type of the Area of Schools	Total Number of Schools	Proposed Number of Schools
Nadia	Rural	305	30
	Urban	91	9
North 24 Parganas	Rural	410	41
	Urban	271	27
Total		1077	107

Sampling Frame

Type of the Area of School	Proposed Number of Schools	Proposed Number of Students from Each School	Total Number of Students
Rural	71	15	1065
Urban	36	15	540
Total	107	15	1605

3.6 Justification for Using Stratified Sampling

In the study presented here, ‘stratified sampling’ was employed to ensure a more accurate and representative selection of the target population—Class XII students in Government-sponsored Bengali medium schools in West Bengal. The justification for using this sampling method is grounded in both theoretical and practical considerations, as outlined below:

3.6.1 Ensuring Representation across Key Subgroups

West Bengal's school system is geographically and demographically diverse. Stratified sampling enables the division of the population into meaningful subgroups (i.e., districts, rural vs. urban school locations), ensuring that each stratum is adequately represented in the final sample (Kish, 1965; Lohr, 2019). In this study, stratification was applied on:

- Geographical Basis: Selection of two districts—Nadia and North 24 Parganas.
- Area Type: Sub-stratification into rural and urban school categories within each district.
- School Type: Inclusion restricted only to Government-sponsored Bengali medium schools, excluding Government and English-medium schools.

This systematic inclusion of diverse educational settings ensures that key variations in socio-economic background, infrastructure, and student characteristics are captured.

3.6.2 Enhancing Statistical Precision

Stratified sampling is known to increase the precision of population estimates, especially when the population is heterogeneous (Cochran, 1977; Thompson, 2012). Within each stratum (e.g., rural schools in Nadia), the variability is lower compared to the entire population. This allows for greater accuracy in parameter estimation (e.g., means, standard deviations, correlations), reducing sampling error compared to simple random sampling.

3.6.3 Facilitating Comparative Analysis

The use of stratification allows for comparative analyses between strata:

- Rural vs. Urban differences in student engagement, psychological capital, or English achievement.
- District-level differences in the impact of classroom climate or parental involvement.

Such comparisons are central to the objectives of this study, and stratified sampling directly supports these analytic goals (Groves et al., 2009).

3.6.4 Addressing Practical Feasibility

Given the vast number of secondary schools across West Bengal (over 1000 Government-sponsored Bengali medium schools in just two districts), complete enumeration is impractical. Stratified sampling offers a balanced trade-off between representation and logistical feasibility:

- It enables proportional sampling from each subgroup,
- Reduces travel and coordination challenges by limiting data collection to manageable clusters, and
- Ensures that the sample size is both statistically sufficient and administratively feasible.

3.6.5 Improving External Validity

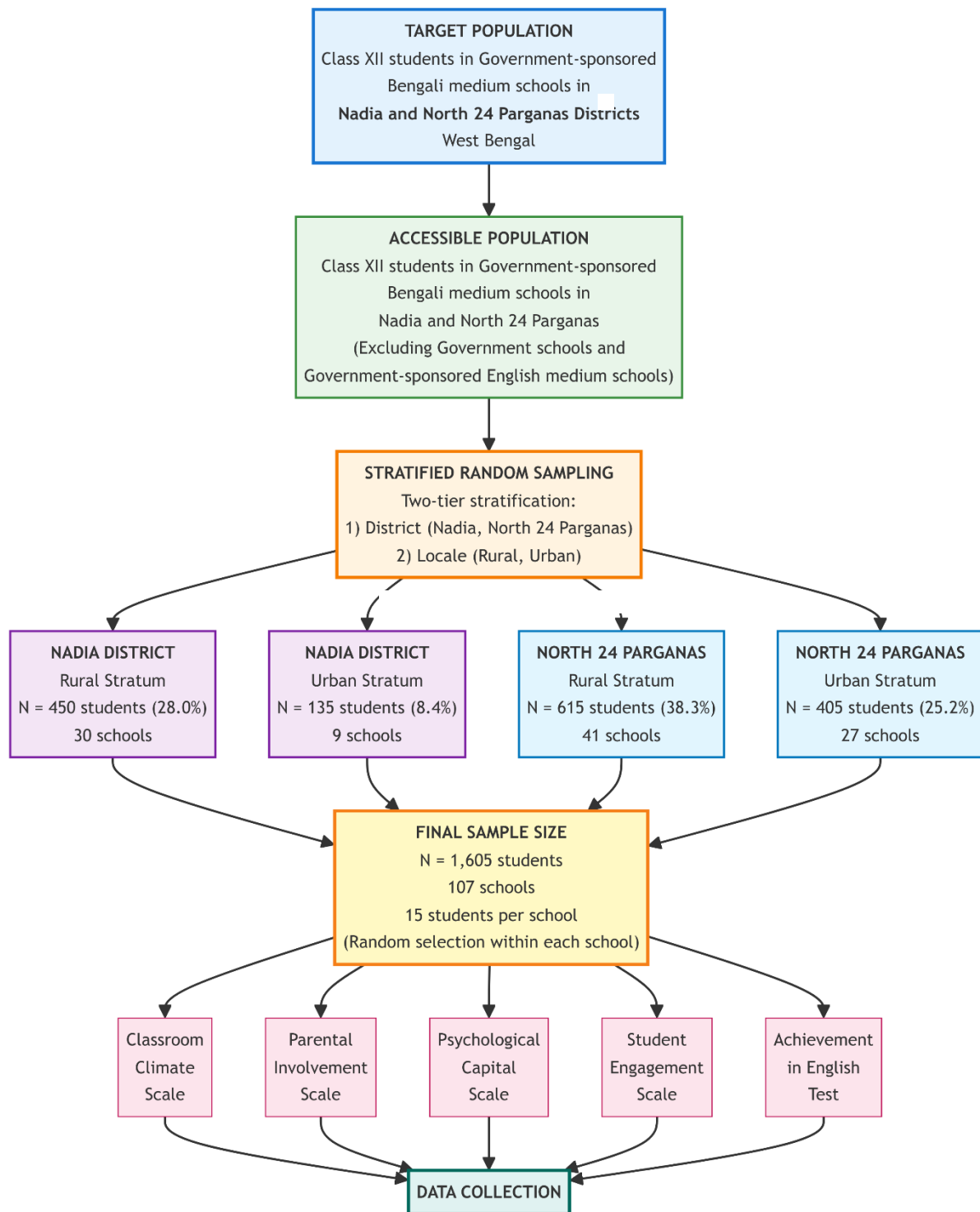
By systematically including schools from both high-performing and underperforming districts (based on social progress indicators), and from both rural and urban settings, stratified sampling enhances the generalizability of findings (Campbell & Stanley, 1963; Cook & Campbell, 1979). The resulting sample more accurately reflects the diverse educational realities of the target population in West Bengal.

3.6.6 Ethical Fairness and Transparency

Stratified sampling ensures equity in participant selection. Every student within a chosen stratum (e.g., urban Bengali medium schools in North 24 Parganas) had equal chances of being selected, enhancing fairness and methodological transparency—an important requirement under ethical research guidelines (American Educational Research Association, 2011).

In summary, stratified sampling was selected because it allows for representative, reliable, and efficient sampling in a diverse educational context. It supports the study's objective of exploring the relationships among classroom climate, parental involvement, psychological capital, student engagement, and English achievement across a socioculturally varied student population.

Figure 3.1: Stratified Sampling Design Flowchart



3.7 Research Instruments

The research instruments employed in this study had been carefully selected to measure the key variables identified in the conceptual framework. Each instrument had established psychometric properties and had been validated for use with ‘secondary school students’. The selection of standardized, psychometrically validated scales as the primary data collection

instruments for this investigation was a deliberate methodological decision grounded in considerations of reliability, validity, comparability, and ethical appropriateness. Standardized scales were preferred over alternative data collection tools—such as researcher-constructed ad hoc questionnaires, observational protocols, or interview schedules—for the following reasons. First, standardized scales with established psychometric properties provide a level of measurement reliability and construct validity that researcher-constructed instruments cannot guarantee without extensive prior validation; the use of validated instruments therefore enhances the credibility and trustworthiness of the study's findings. Second, the use of Likert-type rating scales is particularly appropriate for measuring latent psychological constructs such as Classroom Climate, Parental Involvement, Psychological Capital, and Student Engagement, as these constructs cannot be directly observed but must be inferred from participants' self-reported perceptions; structured rating scales provide a standardized, systematic, and ethically non-intrusive method for capturing these subjective experiences across a large sample. Third, the use of standardized instruments enables meaningful comparison of the present findings with those of prior studies, thereby facilitating the cumulative development of knowledge in the field. Fourth, structured questionnaires are logistically feasible for large-scale data collection involving $N = 1,605$ students across multiple schools and districts, whereas alternative methods such as interviews or observations would be prohibitively time-consuming at this scale. Each instrument was further subjected to rigorous contextual validation—including Exploratory Factor Analysis, Confirmatory Factor Analysis, and reliability testing—to ensure its psychometric adequacy for the specific population and context of the present study, as detailed in the subsections that follow.

The following section provides detailed descriptions of each research tool used for data collection.

3.7.1 Perceived Parental Involvement Questionnaire

Instrument: Perceived Parental Involvement Questionnaire by Victor Anthonyraj and Dr. S. Sashikala

Purpose: This instrument is used for measuring Parental Involvement and only 'the single composite score' of the construct will be used for the present study. Parental Involvement is operationally defined as, "the involvement of parents in the various facets of their children's lives specifically involved in the areas of academics, relationship, discipline, decision making, providing facilities, usage of technology and interest development" (Anthonyraj & Sashikala, 2018).

Target Population: Adolescents of age 13 to 19 years can be administered this tool.

Structure: The questionnaire consists of 30 items which are rated using 'a five-point Likert scale' and is ready to administer. The instrument covers 'seven key dimensions' of Parental Involvement:

- Academic involvement
- Relationship involvement
- Discipline involvement
- Decision making involvement
- Providing facilities
- Usage of technology
- Interest development

Scoring: Responses are scored on 'a five-point scale,' with 'higher scores indicating' greater levels of perceived Parental Involvement across 'the various dimensions.'

Psychometric Properties: The instrument has demonstrated 'adequate reliability and validity' in previous studies with adolescent populations (Anthonyraj & Sashikala, 2018).

3.7.2 Validation of the Perceived Parental Involvement Scale (PPIS)

3.7.2.1 Overview of the Perceived Parental Involvement Scale

The Perceived Parental Involvement Scale (PPIS) developed by Victor Anthonyraj and Sasikala. S was employed in this research to measure the students' perceptions of their parents' involvement in various aspects of their academic and personal lives. The original scale was designed to assess parental involvement across 'multiple dimensions' including academic support, emotional support, monitoring, school engagement, and developmental support (Anthonyraj & Sasikala, 2018).

Given the critical importance of 'parental involvement' in academic achievement, particularly in the Indian educational context, a comprehensive validation process was undertaken to ensure the psychometric adequacy of the instrument for the current study population. The validation process involved multiple stages: initial psychometric evaluation of the original 30-item scale through 'Exploratory Factor Analysis' (EFA) and 'Confirmatory Factor Analysis' (CFA), followed by a systematic refinement process to improve measurement efficiency.

This systematic approach ensured that the final instrument would provide valid and reliable measurements of perceived parental involvement among secondary school students in West Bengal, while maintaining theoretical coherence and practical utility (Kline, 2016; Hair et al., 2019).

3.7.2.2 Psychometric Validation of the Original 30-Item PPIS

‘Exploratory Factor Analysis’(EFA)

Objectives and Rationale: The primary aim of the ‘Exploratory Factor Analysis’ was to uncover the latent ‘factor structure’ of the original 30-item PPI scale and determine whether the observed items align with the theoretical constructs of parental involvement. ‘EFA’ was chosen as the initial analytical approach to explore the underlying dimensionality without imposing a priori constraints on the factor structure (Fabrigar et al., 1999; Costello & Osborne, 2005).

Methodology: The EFA was conducted using a robust methodological framework designed to ensure reliable and interpretable results:

- **Sample Size:** Total 420 participants were included in the analysis, providing an excellent participant-to-item ratio of 14:1, which substantially exceeds the recommended minimum of 10:1 for factor analysis (Nunnally & Bernstein, 1994; MacCallum et al., 1999).
- **Extraction Method:** ‘Principal Component Analysis’ (PCA) with ‘Varimax rotation’ was employed to maximize the interpretability of the factor structure while maintaining orthogonality between factors (Kaiser, 1958; Tabachnick & Fidell, 2019).
- **Criteria for Factor Retention:** Multiple criteria were applied to determine the optimal number of factors:
 - ‘Eigenvalues’ greater than 1.0 (Kaiser criterion)
 - ‘Scree plot’ analysis for visual inspection of factor retention
 - Minimum factor loadings ≥ 0.40 for item retention (Stevens, 2009)

Sampling Adequacy Assessment: Before conducting the factor analysis, the appropriateness of the data for factorization was rigorously assessed using established statistical criteria:

Table 3.6: KMO and Bartlett's Test for Sampling Adequacy

Test	Value	Interpretation
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.988	Excellent
Bartlett's Test of Sphericity - Approx. Chi-Square	8698.927	
df	435	
Significance	.000	Highly Significant

The KMO value of 0.988 indicates excellent sampling adequacy, substantially exceeding the recommended minimum of 0.60 and approaching the maximum possible value of 1.0 (Kaiser, 1974). Bartlett's test of sphericity was highly significant ($p < 0.001$), confirming that the correlation matrix was suitable for factor analysis (Bartlett, 1954).

Factor Extraction Results: The factor extraction process revealed a clear unidimensional structure for the PPIS, as detailed in the variance explanation analysis:

Table 3.7: Total Variance Explained by Principal Component Analysis

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	16.900	56.335	56.335
2	.738	2.460	58.795
3	.675	2.251	61.046
4	.639	2.130	63.176
5	.620	2.068	65.244
6	.599	1.998	67.242
7	.571	1.903	69.145
8	.565	1.882	71.027
9	.529	1.762	72.790
10	.519	1.731	74.521

Note. Only the first 10 components are shown. The complete analysis included all 30 components.

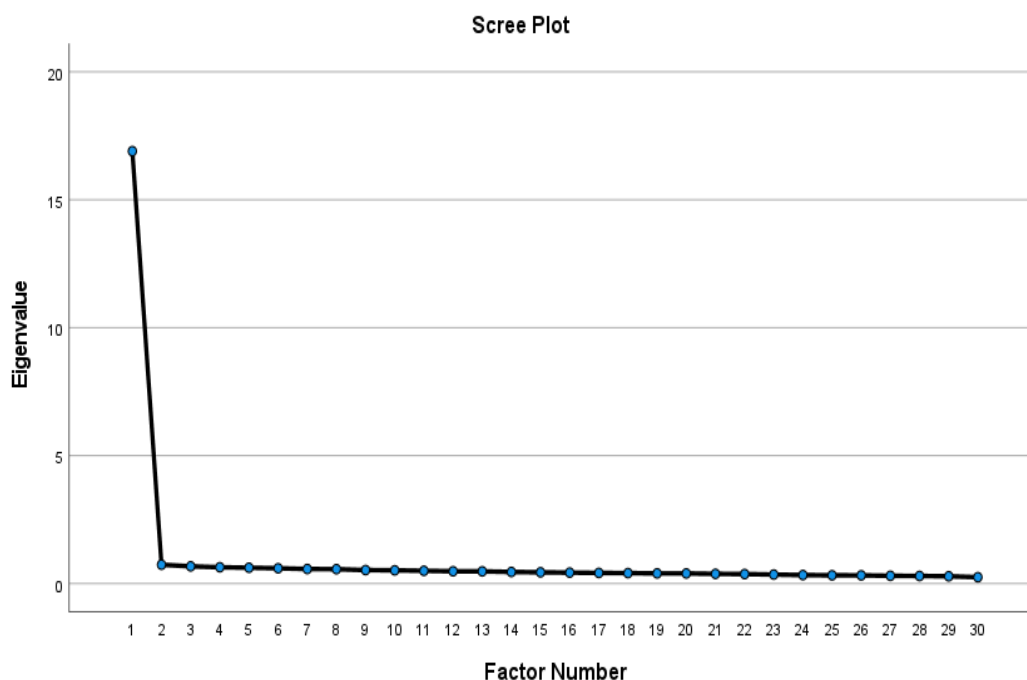
Key Findings:

- 1) 'Unidimensional Structure': Based on the 'scree plot' analysis and 'eigenvalues' > 1 criterion, a 'single-factor solution' was clearly identified. The first component had an eigenvalue of 16.900, which was substantially larger than the second component (0.738), indicating a strong primary factor.
- 2) Variance Explained: The single factor explained 56.335% of the 'total variance', which is considered substantial for a unidimensional scale in social science research (Hair et

al., 2019).

- 3) Factor Loadings: All 30 items loaded strongly onto the ‘single factor’, with loadings ranging from 0.62 to 0.81. No cross-loadings were observed, and no items required removal based on the minimum loading criterion of 0.40.

Figure 3.2: Scree Plot for PPIS Factor Analysis



Goodness-of-Fit Assessment: The extracted factor model demonstrated excellent fit to the observed data:

Table 3.8: Goodness-of-Fit Test for EFA Model

Statistic	Value	Interpretation
Chi-Square	431.649	
df	405	
p-value	0.174	Good fit ($p > 0.05$)

The non-significant chi-square test ($p = 0.174$) indicated that the ‘extracted model’ fits the data well, as the null hypothesis of Excellent fit could not be rejected (Jöreskog & Sörbom, 1993).

‘Confirmatory Factor Analysis’(CFA)

Objectives and Model Specification: After the EFA results, a ‘Confirmatory Factor Analysis’

was conducted to validate the ‘unidimensional’ structure of the PPI scale and assess the overall fit of the hypothesized model. The CFA approach allows for rigorous testing of the ‘factor structure’ identified in the ‘exploratory phase’ while providing comprehensive fit assessment (Brown, 2015; Byrne, 2016).

Methodology:

- Sample: The same sample of 420 participants was used for CFA to maintain consistency and allow for direct comparison with EFA results
- Software: Analysis was conducted using AMOS 26 with ‘Maximum Likelihood Estimation’ (MLE), which is the most widely used and robust estimation method for CFA (Arbuckle, 2019)
- Model Specification:
 - One latent factor (F1) representing perceived parental involvement
 - 30 observed variables corresponding to the PPI items
 - Error terms (e1 to e30) associated with each observed variable
 - No correlated errors or cross-loadings specified in the initial model

Model Fit Assessment: The CFA results demonstrated excellent fit across multiple categories of fit indices, providing robust evidence for the validity of the unidimensional model:

Table 3.9: ‘Confirmatory Factor Analysis’ Fit Indices for 30-Item PPIS (N = 420)

Fit Index	Value	Recommended Threshold	Interpretation
Chi-Square (CMIN)	443.830	-	-
Degrees of Freedom (df)	405	-	-
p-value	0.089	> 0.05	Good fit
CMIN/DF	1.096	< 3.0	Excellent
RMSEA	0.015	≤ 0.06	Excellent
GFI	0.934	≥ 0.90	Good
AGFI	0.924	≥ 0.90	Good
CFI	0.995	≥ 0.95	Excellent

Fit Index	Value	Recommended Threshold	Interpretation
NFI	0.950	≥ 0.90	Excellent
RFI	0.947	≥ 0.90	Excellent
IFI	0.995	≥ 0.95	Excellent
TLI	0.995	≥ 0.95	Excellent
RMR	0.022	≤ 0.08	Excellent

Note. Thresholds based on Hu & Bentler (1999), Kline (2016), and Byrne (2016).

Interpretation of Fit Indices:

- 1) ‘Chi-square Test’: The ‘chi-square’ value of 443.830 with 405 ‘degrees of freedom’ yielded a non-significant result ($p = 0.089$), indicating, the hypothesized model does not significantly differ from the observed data, supporting good model fit (Jöreskog & Sörbom, 1993).
- 2) Relative ‘Chi-square’ (CMIN/DF): The ratio of 1.096 is well below the recommended threshold of 3.0, indicating ‘excellent model fit’ (Carmines & McIver, 1981).
- 3) ‘Root Mean Square Error of Approximation (RMSEA)’: The value of 0.015 is substantially below the threshold of 0.06, indicating excellent fit with minimal approximation error (Browne & Cudeck, 1993).
- 4) ‘Comparative Fit Indices’: The CFI (0.995), IFI (0.995), and TLI (0.995) all exceeded the stringent threshold of 0.95, demonstrating excellent incremental fit relative to a baseline model (Bentler, 1990).
- 5) Goodness of Fit Indices: The ‘GFI’ (0.934) and ‘AGFI’ (0.924) both exceeded the recommended threshold of 0.90, indicating good absolute fit (Jöreskog & Sörbom, 1993).

Standardized Factor Loadings: All items demonstrated significant and substantial loadings on the latent factor, providing strong evidence for convergent validity:

Table 3.10: Standardized Factor Loadings for 30-Item PPIS

Item	Loading	Item	Loading	Item	Loading
Item_1	.758	Item_11	.723	Item_21	.738

Item	Loading	Item	Loading	Item	Loading
Item_2	.740	Item_12	.744	Item_22	.730
Item_3	.734	Item_13	.769	Item_23	.750
Item_4	.728	Item_14	.750	Item_24	.694
Item_5	.741	Item_15	.741	Item_25	.746
Item_6	.744	Item_16	.739	Item_26	.762
Item_7	.726	Item_17	.736	Item_27	.749
Item_8	.737	Item_18	.746	Item_28	.745
Item_9	.708	Item_19	.726	Item_29	.757
Item_10	.761	Item_20	.746	Item_30	.739

Note. All the ‘factor loadings’ were statistically significant ($p < 0.001$). ‘Loadings’ ranged from 0.694 to 0.769, all exceeding the recommended minimum of 0.50 for practical significance.

Convergent Validity Evidence: The ‘standardized factor loadings’ ranged from 0.694 to 0.769, with all loadings being statistically significant ($p < 0.001$). These substantial loadings provide strong evidence for convergent validity, indicating that all items effectively measure the underlying construct of perceived parental involvement (Hair et al., 2019; Fornell & Larcker, 1981).

Composite Reliability (CR) and Cronbach’s Alpha

Sum of Standardized Loadings ($\sum \lambda_i$)=22.550

Sum of Error Variances ($\sum \theta_i$)= 7.450

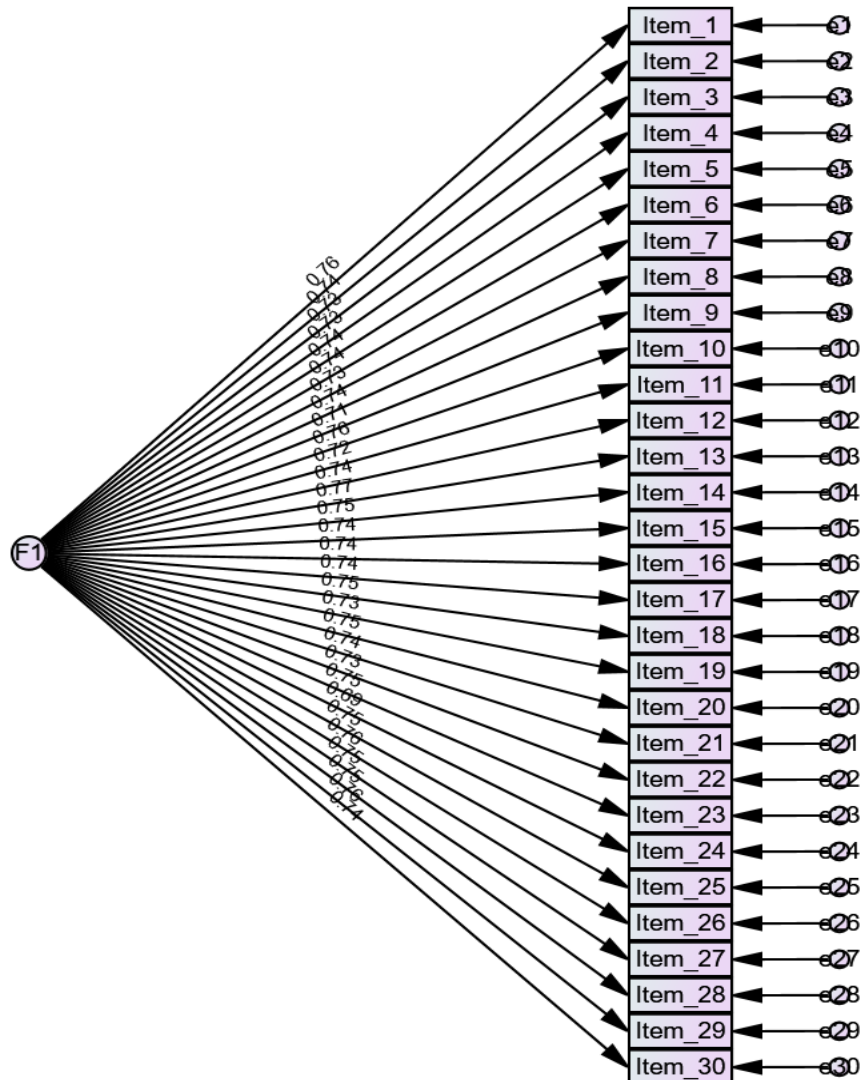
Composite Reliability (CR):

$$\begin{aligned}
 CR &= \frac{(\sum \lambda_i)^2}{[(\sum \lambda_i)^2 + \sum \theta_i]} \\
 &= \frac{(22.550)^2}{[(22.550)^2 + 7.450]} \\
 &\approx 0.985
 \end{aligned}$$

Cronbach's Alpha=0.975 (as per SPSS output)

Interpretation: Both CR and Cronbach’s Alpha exceed the recommended threshold of 0.70, demonstrating excellent internal consistency (Hair et al., 2019; Nunnally & Bernstein, 1994).

Figure 3.3: Path Diagram for CFA of 30-Item PPIS



Model Modification Assessment: ‘Modification indices’ were examined to identify potential areas for model improvement. The analysis suggested minor improvements through correlating specific error terms (e.g., $e7 \leftrightarrow e28$, $e7 \leftrightarrow e21$), but no critical adjustments were deemed necessary as the model already demonstrated excellent fit. The largest modification index was 12.292, which would result in minimal improvement in overall fit (Byrne, 2016).

3.7.2.3 Scale Refinement Process

Rationale for Scale Refinement

Based on the excellent psychometric properties demonstrated by the 30-item PPIS, a systematic refinement process was undertaken to improve measurement efficiency while maintaining construct validity. The refinement was motivated by several theoretical and practical considerations:

- 1) Measurement Efficiency: Reducing respondent burden while maintaining measurement precision (DeVellis, 2017)
- 2) Practical Utility: Creating a more manageable instrument for large-scale research applications (Worthington & Whittaker, 2006)
- 3) Psychometric Optimization: Retaining the most informative items while eliminating redundancy (Clark & Watson, 1995)

Refinement Methodology

The refinement process employed a balanced approach that combined both statistical and conceptual criteria to ensure optimal scale performance:

Statistical Criteria for Item Selection: The statistical criteria prioritized items with higher factor loadings from the original 30-item CFA, which ranged from 0.694 to 0.769. Items demonstrating stronger relationships with the underlying construct were given preference during the selection process (Comrey & Lee, 1992; Tabachnick & Fidell, 2019).

Conceptual Criteria for Content Coverage: The conceptual criteria ensured comprehensive coverage of the content domains identified as essential components of parental involvement:

- 1) Academic Support: Items measuring parents' involvement in homework, assignments, and academic guidance
- 2) Emotional Support: Items assessing parents' emotional availability and responsiveness to children's needs
- 3) Monitoring: Items evaluating parents' supervision and awareness of children's activities
- 4) School Engagement: Items measuring parents' interaction with school and teachers
- 5) Developmental Support: Items assessing parents' role in promoting children's overall development

This dual approach ensured that the refined scale would maintain both statistical rigor and theoretical coherence (Hinkin, 1998; Clark & Watson, 1995). The systematic application of these criteria resulted in a refined 15-item scale that preserved the essential content domains while improving measurement efficiency.

3.7.2.4 Validation of the Refined 15-Item PPIS

‘Confirmatory Factor Analysis’ of the Refined Scale

The ‘structural validity’ of the refined 15-item PPIS was rigorously examined through ‘Confirmatory Factor Analysis’ using data from 240 secondary school students. This separate validation sample ensured independent verification of the refined scale's psychometric properties (Worthington & Whittaker, 2006).

Methodology:

- Sample: 240 secondary school students (independent validation sample)
- Software: AMOS 26 with Maximum Likelihood Estimation (MLE)
- Model Specification: ‘Unidimensional model’ with all 15 items loading onto a single ‘latent factor’

Sample Adequacy Assessment: The sample adequacy for the CFA was evaluated using the Hoelter Index, which indicated a value of 276 at the .05 significance level. This value substantially exceeds the recommended minimum of 200, providing strong evidence for adequate sample size for the complexity of the model being tested (Hoelter, 1983; Byrne, 2016).

Model Fit Results: The ‘CFA’ results demonstrated excellent fit to the data across multiple fit indices:

Table 3.11: ‘Confirmatory Factor Analysis’ Fit Indices for the Refined 15-Item PPIS (N = 240)

Fit Index	Value	Recommended Threshold	Interpretation
‘Chi-square’ (χ^2)	98.137	-	-
‘Degrees of Freedom’(df) 90		-	-
χ^2/df	1.090	< 3.0	Excellent
CFI	0.994	$\geq .95$	Excellent
TLI	0.993	$\geq .95$	Excellent
RMSEA	0.019	$\leq .06$	Excellent
90% CI for RMSEA	[.000, .041] Lower $\leq .05$, Upper < .08		Excellent
PCLOSE	0.994	> .05	Excellent
SRMR	0.049	$\leq .08$	Excellent
GFI	0.950	$\geq .90$	Good
AGFI	0.933	$\geq .90$	Good

Note. Thresholds based on Hu & Bentler (1999) and Kline (2016)

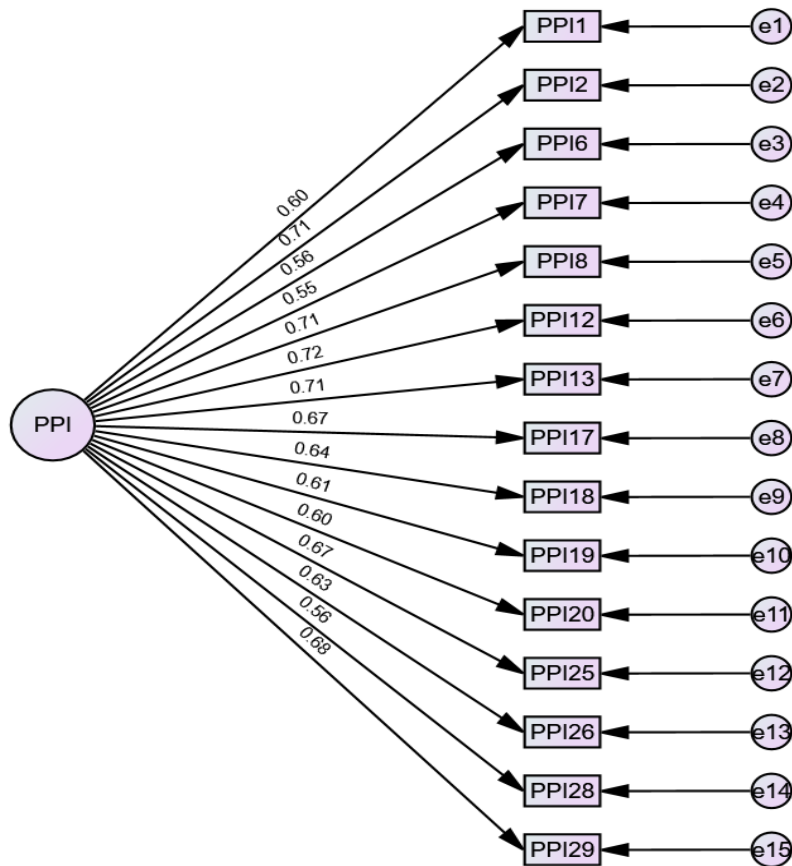


Figure 3.4: Path Diagram for CFA of the 15-Item Refined PPIS

‘Reliability’ and ‘Factor Loadings’ of the Refined Scale

Internal Consistency Reliability: The internal consistency reliability of the refined 15-item PPIS was assessed using Cronbach's alpha coefficient:

Table 3.12: Internal Consistency Reliability for the Refined 15-Item PPIS (N = 240)

Scale	N of Items	Cronbach's Alpha	Interpretation
Perceived Parental Involvement	15	.913	Excellent

Note. Interpretation based on George & Mallery (2003): $\alpha \geq .9$ = Excellent.

Factor Loadings and Item Performance: The factor loadings for all items in the refined scale demonstrated strong relationships with the underlying construct:

Table 3.13: Items and Standardized Factor Loadings for the Refined 15-Item PPIS

Item No.	Item Content	Loading
PPI12	My parents enquire me about the home work given in class.	.80
PPI2	My parents take my opinions seriously while making decisions.	.80
PPI8	My parents want me spend my time usefully.	.78
PPI13	My parents help me to complete the assignments, and projects on time.	.78
PPI26	My parents patiently listen to my problems.	.77
PPI29	My parents are particular that I come back home before a specific time.	.73
PPI18	My parents regularly ask my teachers about my progress.	.72
PPI28	My parents provide me a good atmosphere to study by sacrificing their own comforts.	.72
PPI25	My parents insist me to read aloud to correct my vocabulary and pronunciation.	.71
PPI19	My parents want me to learn lessons from great people.	.70
PPI1	My parents spend time with me.	.69
PPI17	My parents encourage me to read newspapers, books and magazines that enhance general knowledge.	.68
PPI20	My parents' guide me visit useful internet sites.	.68
PPI6	My parents monitor me when I use internet.	.65
PPI7	My parents are interested to know about my teachers' attitude towards me.	.63

Note. All unstandardized regression weights from CFA were statistically significant ($p < .001$), supporting convergent validity. Loadings ranged from .63 to .80, all exceeding the recommended minimum of .50.

Composite Reliability:

The scale's **composite reliability** was computed using the standardized factor loadings:

Using the standard formula for CR:

$$CR = \frac{(\sum \lambda_i)^2}{(\sum \lambda_i)^2 + \sum \theta_i}$$

Where:

- λ_i = Standardized factor loadings

- $\theta_i = 1 - \lambda_i^2$

So putting the value of $\sum \lambda_i = 15.829$, $CR = 0.874$

This indicates a high degree of ‘internal consistency’ and ‘reliability’.

3.7.2.5 Validity Evidence for the PPIS

Content Validity

The ‘content validity’ of the PPIS was established through multiple sources of evidence:

- 1) Expert Review: The original scale development involved expert review to ensure comprehensive coverage of parental involvement domains (Anthonyraj & Sasikala, 2018)
- 2) Theoretical Alignment: The scale items align with established frameworks of parental involvement, particularly Epstein's (2001) typology and Hoover-Dempsey & Sandler's (1997) model
- 3) Content Domain Coverage: The refined scale maintains representation across all key ‘dimensions’ of parental involvement identified in the literature

Construct Validity

The construct validity was supported through multiple sources of evidence:

- 1) Structural Validity: The excellent fit of both the 30-item and 15-item CFA models provided strong evidence for structural validity (AERA et al., 2014)
- 2) Convergent Validity: The significant and substantial factor loadings demonstrated convergent validity (Campbell & Fiske, 1959)
- 3) Internal Structure: The high internal consistency reliability provided additional evidence for construct homogeneity (Cronbach, 1951)

Cultural Appropriateness

The validation process confirmed the cultural appropriateness of the PPIS for the Indian educational context. The items reflected parental involvement practices that are meaningful and relevant within the West Bengal secondary school system, ensuring ecological validity (Bronfenbrenner, 1979; Sue, 1999).

3.7.2.6 Summary of PPIS Validation

The comprehensive validation of the Perceived Parental Involvement Scale demonstrated excellent psychometric properties across both the original 30-item version and the refined 15-item version. The systematic validation process included:

- 1) Initial Validation (N = 420): EFA and CFA of the 30-item scale demonstrated unidimensional structure with excellent fit indices and strong factor loadings (.694-.769)
- 2) Scale Refinement: Systematic reduction to 15 items using combined statistical and conceptual criteria while maintaining content domain coverage
- 3) Independent Validation (N = 240): CFA of the refined 15-item scale confirmed excellent psychometric properties with superior fit indices and strong reliability ($\alpha = .913$)

The final 15-item PPIS provides a reliable, valid, and efficient measure of perceived parental involvement that is culturally appropriate for secondary school students in West Bengal. The scale maintains comprehensive coverage of key parental involvement domains while offering practical advantages for research applications.

Key Psychometric Achievements:

- Unidimensional structure confirmed through both EFA and CFA
- Excellent reliability ($\alpha = .913$ for refined scale)
- Strong convergent validity (all loadings $> .60$)
- Excellent model fit across all major fit indices
- Cultural appropriateness for Indian educational context
- Measurement efficiency through systematic refinement process

3.7.3 Classroom Climate Scale

Purpose: In the present study 'the Classroom Climate Scale' by Muthee will be adapted, standardized and used. The scale is intended to measure 'the primary student's or up to standard 8th students' perception' of psychological processes going on in the classroom. The study was originally conducted for 'the city of Nairobi.'

Structure: There are 'a total of 36 items' in the scale, out of which '19 were positively worded' and '17 were negatively worded.' The items required 'the respondents' to indicate 'how often certain things occur' in their classroom, by selecting 'the appropriate choices.' The four response anchors provided along with the statements were 'always', 'frequently', 'sometimes', and 'never'.

Dimensions Measured: The scale measures 'four key aspects' of Classroom Climate:

- Physically welcoming and conducive environment
- Socially interactive environment
- Emotionally supportive environment that enhances self-esteem and belongingness

- Intellectually stimulating environment that encourages learning and self-fulfillment

Reliability: Cronbach's alpha computed for the scale is found to be 0.826, indicating that it has 'good reliability' (Muthee, 2011).

Adaptation: The present study will make use of 'just the composite score' of the construct after 'appropriate cultural and linguistic adaptation' for the West Bengal context.

3.7.3.1 Validation of the Classroom Climate Scale (CCS)

Overview of the Classroom Climate Scale

The Classroom Climate Scale (CCS) developed by Jessina Muthee (2011) was employed in this study to measure students' perceptions of 'their classroom learning environment.' The original scale was designed to assess 'four key aspects' of Classroom Climate: 'a physically welcoming and conducive environment,' 'a socially interactive environment,' 'an emotionally supportive environment' that enhances self-esteem and belongingness, and 'an intellectually stimulating environment' that encourages learning and self-fulfillment (Muthee, 2011).

Given 'the critical importance' of Classroom Climate in 'academic achievement' and Student Engagement, particularly in 'the Indian educational context,' 'a comprehensive validation process' was undertaken to ensure 'the psychometric adequacy' of the instrument for 'the current study population.' The validation process involved 'multiple stages': 'initial psychometric evaluation' of the original 36-item scale through "Exploratory Factor Analysis'(EFA)' and "Confirmatory Factor Analysis'(CFA),' followed by 'a systematic refinement process' to improve 'measurement efficiency' while maintaining 'construct validity.'

This systematic approach ensured that the final instrument would provide valid and reliable measurements of perceived classroom climate among secondary school students in West Bengal, while maintaining theoretical coherence and practical utility (Kline, 2016; Hair et al., 2019).

3.7.3.2 Psychometric Validation of the Original 36-Item CCS

'Exploratory Factor Analysis'(EFA)

Objectives and Rationale: The primary aim of the 'Exploratory Factor Analysis' was to uncover the latent 'factor structure' of the original 36-item Classroom Climate Scale and determine whether the observed items align with the theoretical constructs of classroom climate. 'EFA' was chosen as the initial analytical approach to explore the underlying dimensionality without imposing a priori constraints on the factor structure (Fabrigar et al., 1999; Costello & Osborne, 2005).

Methodology: The EFA was conducted using a robust methodological framework designed to

ensure reliable and interpretable results:

- **Sample Size:** A total of 420 secondary school students from Class XI and XII in West Bengal, India were included in the analysis, providing an excellent participant-to-item ratio of 11.7:1, which substantially exceeds the recommended minimum of 10:1 for factor analysis (Nunnally & Bernstein, 1994; MacCallum et al., 1999).
- **Extraction Method:** ‘Principal Axis Factoring’ with ‘Direct Oblimin rotation’ was employed to allow for potential correlations between factors while maximizing the interpretability of the factor structure (Fabrigar et al., 1999; Tabachnick & Fidell, 2019).
- **Criteria for Factor Retention:** Multiple criteria were applied to determine the optimal number of factors:
 - ‘Eigenvalues’ greater than 1.0 (Kaiser criterion)
 - Scree plot analysis for visual inspection of factor retention
 - Minimum factor loadings ≥ 0.40 for item retention (Stevens, 2009)

Sampling Adequacy Assessment: Prior to conducting the factor analysis, the appropriateness of the data for factorization was rigorously assessed using established statistical criteria:

Table 3.14: KMO and Bartlett's Test for Sampling Adequacy (36-Item CCS)

Test	Value	Interpretation
‘Kaiser-Meyer-Olkin Measure of Sampling Adequacy’	.989	Excellent
‘Bartlett's Test of Sphericity’ - Approx. Chi-Square	12360.734	
df	630	
Significance	.000	Highly Significant

The Kaiser-Meyer-Olkin measure yielded a value of 0.989, demonstrating 'excellent sampling adequacy' that far surpassed the conventionally accepted threshold of 0.60 and closely approached the theoretical maximum of 1.0 (Kaiser, 1974). The Bartlett's sphericity test produced statistically significant results ($p < 0.001$), thereby validating that the inter-correlation matrix possessed adequate characteristics for conducting 'factor analysis' through

the rejection of the hypothesis proposing that the ‘correlation matrix’ represents an ‘identity matrix’ (Bartlett, 1954).

Factor Extraction Results: The ‘factor extraction process’ revealed a clear unidimensional structure for the CCS, as detailed in the variance explanation analysis:

Table 3.15: Total Variance Explained by Principal Axis Factoring (36-Item CCS)

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	21.766	60.462	60.462	21.364	59.345	59.345
2	0.708	1.966	62.429			
3	0.657	1.824	64.253			
4	0.624	1.732	65.986			
5	0.589	1.637	67.623			
6	0.573	1.593	69.216			
7	0.553	1.535	70.751			
8	0.532	1.479	72.230			
9	0.530	1.471	73.701			
10	0.507	1.407	75.108			

Note. Only the first 10 factors are shown. The complete analysis included all 36 factors.

Key Findings:

- 1) **Unidimensional Structure:** Drawing from 'the scree plot analysis' and the criterion of eigenvalues exceeding 1, a 'single-factor solution' emerged as clearly identifiable. The primary factor demonstrated an eigenvalue of 21.766, substantially surpassing the secondary factor's value (0.708), thereby indicating 'a strong primary factor.'
- 2) **Variance Explained:** The solitary factor accounted for 59.345% of the aggregate variance following extraction, which represents a substantial proportion for 'a unidimensional scale' within social science research contexts (Hair et al., 2019).
- 3) **Factor Loadings:** The complete set of 36 items exhibited robust loadings on 'the single factor,' with loading values spanning from 0.698 to 0.833 in absolute magnitude, as presented in Table 3.25.

Figure 3.5: Scree Plot for 36-Item CCS Factor Analysis

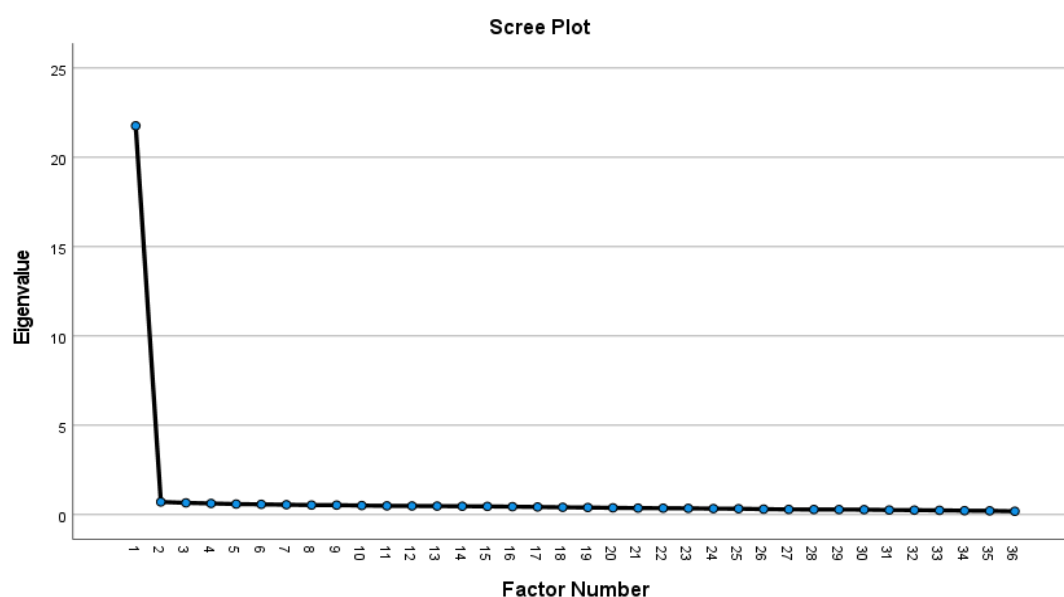


Table 3.16: Factor Loadings for 36-Item CCS (Principal Axis Factoring)

Item	Factor Loading	Item	Factor Loading	Item	Factor Loading
Q1	.833	Q13	-.798	Q25	.817
Q2	-.794	Q14	-.780	Q26	-.787
Q3	-.790	Q15	.791	Q27	-.752
Q4	.742	Q16	.759	Q28	.717
Q5	.772	Q17	.789	Q29	-.758
Q6	.718	Q18	.698	Q30	-.782
Q7	-.810	Q19	-.727	Q31	.740
Q8	.707	Q20	.815	Q32	.727
Q9	.761	Q21	-.757	Q33	-.800
Q10	.739	Q22	-.727	Q34	.788
Q11	-.766	Q23	-.793	Q35	-.795
Q12	.810	Q24	-.766	Q36	.800

Note. Extraction Method: Principal Axis Factoring. Negative loadings indicate reverse-coded items. All loadings exceeded the minimum threshold of 0.40.

‘Confirmatory Factor Analysis’(CFA)

Objectives and Model Specification: Following the EFA results, a ‘Confirmatory Factor Analysis’ was conducted to validate the unidimensional structure of the CCS and assess the overall fit of the hypothesized model. The CFA approach allows for rigorous testing of the factor structure identified in the exploratory phase while providing comprehensive fit assessment (Brown, 2015; Byrne, 2016).

Methodology:

- Sample: The same sample of 420 secondary school students was used for CFA to maintain consistency and allow for direct comparison with EFA results
- Software: Analysis was conducted using AMOS 26 with Maximum Likelihood Estimation (MLE), which is the most widely used and robust estimation method for CFA (Arbuckle, 2019)
- Model Specification:
 - One latent factor representing classroom climate
 - 36 observed variables corresponding to the CCS items
 - Error terms (e1 to e36) associated with each observed variable
 - No correlated errors or cross-loadings specified in the initial model

Model Fit Assessment: The CFA results demonstrated excellent fit across multiple categories of fit indices, providing robust evidence for the validity of the unidimensional model:

Table 3.17: ‘Confirmatory Factor Analysis ’Fit Indices for 36-Item CCS (N = 420)

Fit Index	Value	Recommended Threshold	Interpretation
Chi-Square (CMIN)	730.593	-	-
Degrees of Freedom (df)	594	-	-
p-value	< .001	> 0.05	Significant
CMIN/DF	1.230	< 3.0	Excellent
RMSEA	0.023	≤ 0.06	Excellent
RMSEA 90% CI	[0.017, 0.029] Lower ≤ 0.05, Upper < 0.08		
PCLOSE	1.000	> 0.05	Excellent
CFI	0.989	≥ 0.95	Excellent
TLI	0.988	≥ 0.95	Excellent
IFI	0.989	≥ 0.90	Excellent

Fit Index	Value	Recommended Threshold	Interpretation
NFI	0.943	≥ 0.90	Excellent
RFI	0.939	≥ 0.90	Good
SRMR	0.025	≤ 0.08	Excellent
GFI	0.915	≥ 0.90	Good
AGFI	0.905	≥ 0.90	Good
PGFI	0.816	> 0.50	Acceptable
Hoelter (0.05)	374	> 200	Adequate sample size

Note. Thresholds based on Hu & Bentler (1999), Kline (2016), and Byrne (2016).

Interpretation of Fit Indices:

1.Relative Chi-square (CMIN/DF): The ratio of 1.230 is well below the recommended threshold of 3.0, indicating excellent model fit (Carmines & McIver, 1981).

2.Root Mean Square Error of Approximation (RMSEA): The value of 0.023 is substantially below the threshold of 0.06, with the 90% confidence interval [0.017, 0.029] providing additional evidence of excellent fit. The PCLOSE value of 1.000 strongly supported the hypothesis of close fit (Browne & Cudeck, 1993).

3.Comparative Fit Indices: The CFI (0.989), TLI (0.988), and IFI (0.989) all exceeded the stringent threshold of 0.95, demonstrating excellent incremental fit relative to a baseline model (Bentler, 1990).

4.Goodness of Fit Indices: The GFI (0.915) and AGFI (0.905) both exceeded the recommended threshold of 0.90, indicating good absolute fit (Jöreskog & Sörbom, 1993).

Standardized Factor Loadings: All items demonstrated significant and substantial loadings on the latent factor, providing strong evidence for convergent validity:

Table 3.18: Standardized Regression Weights for 36-Item CCS

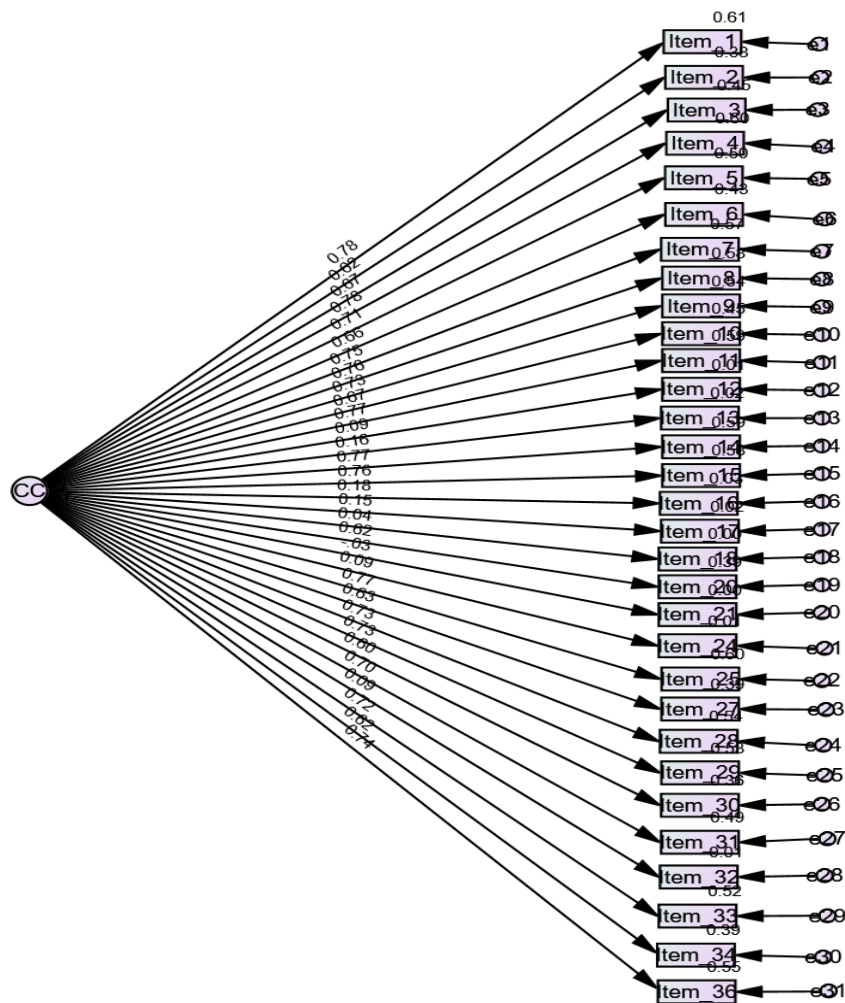
Item	Estimate	S.E.	C.R.	P	Item	Estimate	S.E.	C.R.	P
Q1	1.000	-	-	-	Q19	-.873	.050	-17.577	***
Q2	-.953	.048	-19.998	***	Q20	.980	.047	20.896	***
Q3	-.948	.048	-	***	Q21	-.911	.049	-	***

Item	Estimate	S.E.	C.R.	P	Item	Estimate	S.E.	C.R.	P
			19.834					18.670	
Q4	.890	.049	18.045	***	Q22	-.872	.050	-	***
								17.545	
Q5	.926	.048	19.131	***	Q23	-.954	.048	-	***
								20.013	
Q6	.862	.050	17.242	***	Q24	-.918	.049	-	***
								18.903	
Q7	-.973	.047	-	***	Q25	.981	.047	20.933	***
			20.636						
Q8	.847	.050	16.846	***	Q26	-.945	.048	-	***
								19.731	
Q9	.913	.049	18.734	***	Q27	-.902	.049	-	***
								18.419	
Q10	.888	.049	18.005	***	Q28	.862	.050	17.246	***
Q11	-.917	.049	-	***	Q29	-.910	.049	-	***
			18.877					18.666	
Q12	.972	.047	20.608	***	Q30	-.940	.048	-	***
								19.565	
Q13	-.958	.048	-	***	Q31	.888	.049	18.002	***
			20.160						
Q14	-.936	.048	-	***	Q32	.871	.050	17.523	***
			19.444						
Q15	.949	.048	19.878	***	Q33	-.960	.047	-	***
								20.233	
Q16	.910	.049	18.654	***	Q34	.947	.048	19.790	***
Q17	.948	.048	19.834	***	Q35	-.955	.048	-	***
								20.058	
Q18	.837	.051	16.566	***	Q36	.961	.047	20.264	***

Note. All regression weights were statistically significant ($p < .001$). Negative values indicate reverse-coded items.

Convergent Validity Evidence: The standardized factor loadings ranged from 0.837 to 0.981 (absolute values), with all loadings being statistically significant ($p < .001$). These substantial loadings provide strong evidence for convergent validity, indicating that all items effectively measure the underlying construct of classroom climate (Hair et al., 2019; Fornell & Larcker, 1981).

Figure 3.6: Path Diagram for CFA of 36-Item Classroom Climate Scale(CCS)



Internal Consistency Reliability: The internal consistency reliability of the original 36-item CCS was assessed using Cronbach's alpha coefficient. The analysis revealed excellent internal consistency reliability ($\alpha = .98$), substantially exceeding the minimum standards for research applications (Nunnally & Bernstein, 1994; George & Mallery, 2003).

3.7.3.3 Scale Refinement Process

Rationale for Scale Refinement

Based on the excellent psychometric properties demonstrated by the 36-item CCS, a systematic refinement process was undertaken to improve measurement efficiency while maintaining construct validity. The refinement was motivated by several theoretical and practical considerations:

- 1.Measurement Efficiency: Reducing respondent burden and fatigue while maintaining measurement precision (DeVellis, 2017; Worthington & Whittaker, 2006)
- 2.Practical Utility: Creating a more manageable instrument for large-scale research applications in educational settings
- 3.Psychometric Optimization: Retaining the most informative items while eliminating redundancy (Clark & Watson, 1995)
- 4.Response Quality: Shorter instruments potentially increase response rates and data quality (Hair et al., 2019)

Refinement Methodology

The refinement process employed a balanced approach that combined both statistical and conceptual criteria to ensure optimal scale performance, following best practices in scale refinement (Hair et al., 2019; Boateng et al., 2018):

Statistical Criteria for Item Selection: The primary statistical criterion for item retention was factor loading magnitude, representing the strength of relationship between each item and the underlying classroom climate construct (Brown, 2015). The CFA results from the original 36-item scale revealed standardized factor loadings ranging from 0.837 to 0.981, all well above the conventional threshold of 0.40 recommended by Matsunaga (2010).

Conceptual Criteria for Content Coverage: While statistical properties are important, content validity must not be sacrificed for statistical optimization (Haynes et al., 1995). Therefore, the refinement process also considered:

- 1.Content Domain Coverage: Ensuring all theoretical dimensions of classroom climate are represented
- 2.Balance of Positive and Negative Items: Maintaining a mix of positively and negatively worded items to control for response bias
- 3.Conceptual Distinctiveness: Including items that capture unique aspects of classroom climate even if their loadings are not among the highest

Items Selected for the Refined Scale: Based on the integrated approach of statistical strength and conceptual importance, 20 items were retained for the refined Classroom Climate Scale. The selection process prioritized 16 items based primarily on statistical criteria (highest factor loadings) and 4 items based on conceptual importance to ensure comprehensive content

coverage.

Balanced Selection Approach: The refined 20-item scale represents a thoughtful balance between statistical optimization and content validity considerations:

- Statistical Selection (16 items): Items with factor loadings ranging from 0.92 to 0.98
- Conceptual Selection (4 items): Items with factor loadings ranging from 0.87 to 0.89, selected to ensure comprehensive coverage of classroom climate dimensions
- Balanced Wording: 11 negatively worded (reverse-coded) and 9 positively worded items to reduce acquiescence bias (Podsakoff et al., 2012)

3.7.3.4 Validation of the Refined 20-Item CCS

‘Confirmatory Factor Analysis’ of the Refined Scale

The structural validity of the refined 20-item CCS was rigorously examined through ‘Confirmatory Factor Analysis’ using data from 240 secondary school students. This separate validation sample ensured independent verification of the refined scale's psychometric properties (Worthington & Whittaker, 2006).

Methodology:

- Sample: 240 secondary school students (independent validation sample)
- Software: AMOS 26 with Maximum Likelihood Estimation (MLE)
- Model Specification: Unidimensional model with all 20 items loading onto a single latent factor representing classroom climate

Sample Adequacy Assessment: The sample adequacy for the CFA was evaluated using the Hoelter Index, which indicated values of 241 at the .05 significance level and 258 at the .01 level. These values substantially exceed the recommended minimum of 200, providing strong evidence for adequate sample size for the complexity of the model being tested (Hoelter, 1983; Byrne, 2016).

Model Fit Results: The CFA results demonstrated excellent fit to the data across multiple fit indices:

Table 3.19: ‘Confirmatory Factor Analysis’ Fit Indices for the Refined 20-Item CCS (N = 240)

Fit Index	Value	Recommended Threshold	Interpretation
Chi-square (χ^2)	199.962	-	-
Degrees of Freedom (df)	170	-	-

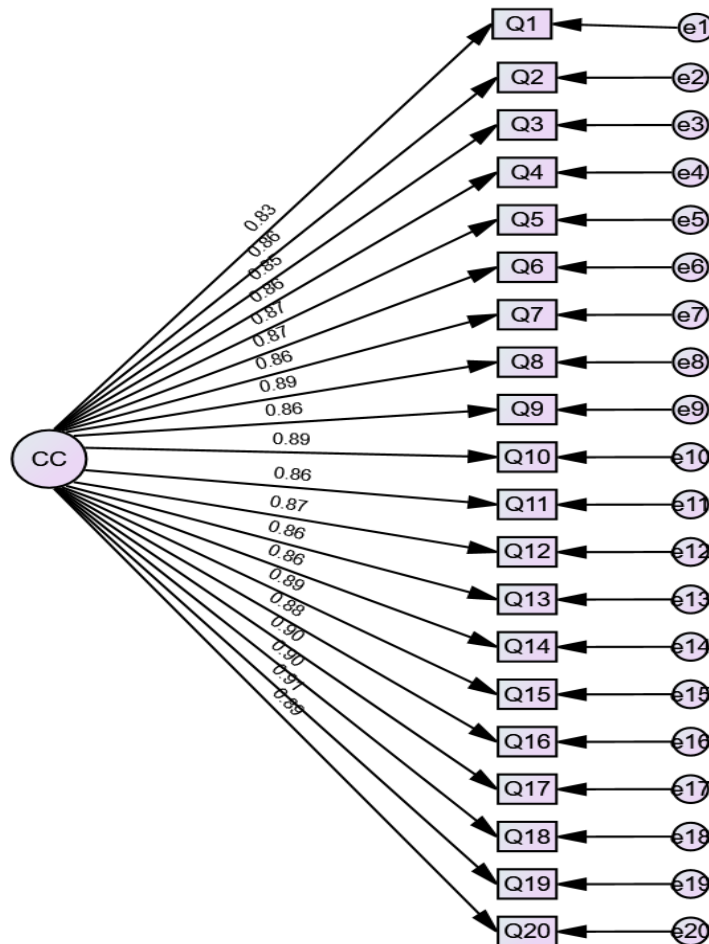
Fit Index	Value	Recommended Threshold	Interpretation
p-value	0.058	> 0.05	Non-significant (good fit)
χ^2/df	1.176	< 3.0	Excellent
CFI	0.995	$\geq .95$	Excellent
TLI	0.994	$\geq .95$	Excellent
NFI	0.967	$\geq .90$	Excellent
RFI	0.963	$\geq .90$	Excellent
IFI	0.995	$\geq .90$	Excellent
RMSEA	0.027	$\leq .06$	Excellent
90% CI for RMSEA	[.000, .041]	Lower $\leq .05$, Upper < .08	Excellent
PCLOSE	0.998	> .05	Excellent
RMR	0.009	$\leq .08$	Excellent
GFI	0.928	$\geq .90$	Good
AGFI	0.911	$\geq .90$	Good

Note. Thresholds based on Hu & Bentler (1999) and Kline (2016).

Interpretation of Fit Indices:

- 1) **Chi-square Test:** The statistically non-significant chi-square result ($p = 0.058$) demonstrates the absence of meaningful discrepancy between 'observed covariance matrix' and 'model-implied covariance matrix,' suggesting 'excellent model fit' (Jöreskog & Sörbom, 1993).
- 2) **Relative Chi-square:** The χ^2/df ratio of 1.176 falls beneath the conventionally accepted conservative criterion of 2.0, signaling 'excellent model fit' (Carmines & McIver, 1981).
- 3) **Comparative Fit Indices:** The CFI (0.995), TLI (0.994), NFI (0.967), and IFI (0.995) all surpassed the benchmark of 0.95, evidencing 'excellent incremental fit' (Bentler, 1990).
- 4) **Absolute Fit Indices:** The RMSEA value of 0.027 accompanied by PCLOSE = 0.998 remains substantially beneath the critical threshold of 0.05, signifying 'excellent fit' with negligible 'error of approximation' (Browne & Cudeck, 1993).

Figure 3.7: Path Diagram for CFA of the 20-Item Refined Classroom Climate Scale(CCS)



Reliability and Factor Loadings of the Refined Scale

‘Internal Consistency Reliability’: The ‘internal consistency reliability’ of the refined 20-item CCS was assessed using ‘Cronbach's alpha coefficient’:

Table 3.20: ‘Internal Consistency Reliability’ for the Refined 20-Item CCS (N = 240)

Scale	N of Items	Cronbach's Alpha	Interpretation
Classroom Climate	20	.94	Excellent

Note. Interpretation based on George & Mallery (2003): $\alpha \geq .9$ = Excellent.

Composite Reliability: In addition to Cronbach's alpha, composite reliability was calculated to provide a more accurate estimate of internal consistency, particularly for scales with varying factor loadings (Hair et al., 2019). The ‘composite reliability’ for the refined 20-item CCS was

.95, indicating excellent reliability and confirming the internal consistency findings.

Factor Loadings and Item Performance: The factor loadings for all items in the refined scale demonstrated strong relationships with the underlying construct:

Table 3.21: Items and Standardized Factor Loadings for the Refined 20-Item CCS

Item No.	Item Content	Loading	Wording Type
Q27	“Our teacher spends little time talking to us.”*	.98	Negative
Q34	“Our teacher gives a chance to each student of my class to talk to him/her.”	.98	Positive
Q36	“Leaders in my class are selected according to their abilities rather than position in the exams”.	.97	Positive
Q35	“Our teacher just reads from the text book while teaching a lesson in class.”*	.97	Negative
Q8	“Our teacher listens to us before she/ he gives us punishment”.	.97	Positive
Q4	“Good discipline is maintained in my class”.	.96	Positive
Q13	“Our teacher has to keep on shouting to make the students quiet.”*	.96	Negative
Q21	“Discussion in my class ends up in confusion.”*	.96	Negative
Q19	“Our class is very noisy”*	.95	Negative
Q14	“I feel uncomfortable with my teachers behavior”*	.95	Negative
Q26	“Our teacher forgets the names of the students in the class.”*	.95	Negative
Q18	“Our classroom is cleaned every day of the week.”	.94	Positive
Q25	Students in my class take part in interclass competitions.	.94	Positive
Q11	“In my class, we go on talking to each other even in the presence of the teacher.”*	.94	Negative
Q33	“Our teacher discourages us from asking questions in the class.”*	.93	Negative
Q1	“Students enjoy class room activities so much that they dislike to remain absent from school.”	.92	Positive
Q15	“The activities in my class are planned in advance”.	.89	Positive

Item No.	Item Content	Loading	Wording Type
Q23	“I feel my class is like a prison.”*	.88	Negative
Q6	“Teachers say that our class is well behaved.”	.87	Positive
Q31	“Our teacher uses different teaching aids like charts, models etc. while teaching a lesson.”	.87	Positive

Note. Items marked with * were reverse-coded before analysis. All loadings were significant ($p < .001$). Loadings ranged from .87 to .98, all exceeding the recommended minimum of .50. Content Domain Representation: The final 20-item scale maintained comprehensive coverage of the theoretical domains of classroom climate:

1. Teacher-Student Relationships (Items Q27, Q34, Q8, Q14, Q26, Q33): Direct interactions and communication patterns between teachers and students
2. Classroom Management and Discipline (Items Q4, Q13, Q21, Q19, Q11): Order, structure, and behavioral expectations in the classroom
3. Learning Environment (Items Q36, Q35, Q18, Q25, Q1, Q15, Q31): Physical and academic conditions that support learning
4. Emotional Climate (Items Q23, Q6): Emotional safety and supportiveness of the classroom atmosphere

3.7.3.5 Validity Evidence for the CCS

Content Validity

The ‘content validity’ of the CCS was established through multiple sources of evidence:

1. Expert Review: The original scale development by Muthee (2011) involved expert review to ensure comprehensive coverage of classroom climate domains
2. Theoretical Alignment: The scale items align with established frameworks of classroom climate, particularly those emphasizing physical, social, emotional, and intellectual dimensions
3. Content Domain Coverage: The refined scale maintains representation across all key dimensions of classroom climate identified in the literature

Construct Validity

The construct validity was supported through multiple sources of evidence:

1. Structural Validity: The excellent fit of both the 36-item and 20-item CFA models provided strong evidence for structural validity (AERA et al., 2014)
2. Convergent Validity: The significant and substantial factor loadings demonstrated convergent validity (Campbell & Fiske, 1959)

3. Internal Structure: The high internal consistency reliability and composite reliability provided additional evidence for construct homogeneity (Cronbach, 1951)

4. Composite Reliability (CR) Calculation for Classroom Climate Scale (CCS)

Formula:

$$CR = (\sum \lambda_i)^2 / [(\sum \lambda_i)^2 + \sum (1 - \lambda_i^2)]$$

Where:

λ_i = standardized factor loading for item i

i) Original 36-item CCS

$$\sum \lambda_i = 28.315$$

$$(\sum \lambda_i)^2 = 801.739$$

$$\sum (1 - \lambda_i^2) = 13.619$$

$$\text{Composite Reliability (CR)} = 0.983$$

ii) Refined 20-item CCS

$$\sum \lambda_i = 18.780$$

$$(\sum \lambda_i)^2 = 352.688$$

$$\sum (1 - \lambda_i^2) = 2.342$$

$$\text{Composite Reliability (CR)} = 0.993$$

Interpretation:

- A 'CR value' above 0.70 indicates good internal consistency.

- Both versions of the CCS show excellent reliability:

$$> CR_{36} = 0.983$$

$$> CR_{20} = 0.993$$

Cultural Appropriateness

The validation process confirmed the cultural appropriateness of the CCS for the Indian educational context. The items reflected classroom climate aspects that are meaningful and relevant within the West Bengal secondary school system, ensuring ecological validity (Bronfenbrenner, 1979; Sue, 1999).

3.7.3.6 Summary of CCS Validation

The comprehensive validation of the Classroom Climate Scale demonstrated excellent psychometric properties across both the original 36-item version and the refined 20-item version. The systematic validation process included:

1. Initial Validation (N = 420): EFA and CFA of the 36-item scale demonstrated unidimensional structure with excellent fit indices and strong factor loadings (.837-.981)

2. Scale Refinement: Systematic reduction to 20 items using combined statistical and

conceptual criteria while maintaining content domain coverage

3.Independent Validation (N = 240): CFA of the refined 20-item scale confirmed excellent psychometric properties with superior fit indices and strong reliability ($\alpha = .94$, composite reliability = .95)

The final 20-item CCS provides a reliable, valid, and efficient measure of perceived classroom climate that is culturally appropriate for secondary school students in West Bengal. The scale maintains comprehensive coverage of key classroom climate domains while offering practical advantages for research applications.

Key Psychometric Achievements:

- Unidimensional structure confirmed through both EFA and CFA
- Excellent reliability ($\alpha = .94$, composite reliability = .95 for refined scale)
- Strong convergent validity (all loadings > .87)
- Excellent model fit across all major fit indices
- Cultural appropriateness for Indian educational context
- Measurement efficiency through systematic refinement process (44% reduction in items)
- Balanced item selection maintaining both statistical rigor and content validity.

3.7.4 Psychological Capital Assessment Scale

Instrument: Psychological Capital Assessment Scale by Dr. Reena Rani and Ms. Menka Choudhary (2007)

Purpose: The Psychological Capital Assessment Scale (PCAS) will be administered to the participants to measure their psychological capital levels.

Structure: The Psychological Capital Questionnaire (PCAS) by Dr. Reena Rani and Ms. Menka Choudhary (2007) contains 24 items that measure an individual's psychological capital. The PCAS is comprised of four dimensions that result in measurement of the current state of an individual's psychological capital.

Dimensions: The four dimensions measured are:

- Hope: 'Goal-directed energy and pathways thinking'.
- Efficacy: 'Confidence in one's ability to succeed in specific tasks'
- Resilience: 'Capacity to bounce back from adversity and setbacks'
- Optimism: 'Positive attribution style about future success'

Scoring: The present research made use of just the composite score of the construct to obtain an overall measure of psychological capital.

Adaptation: The reliability and validity of the study was calculated before its adaptation and

its administration to ensure cultural appropriateness and psychometric soundness.

3.7.4.1 Validation of the Psychological Capital Assessment Scale (PCAS)

Overview of the Psychological Capital Assessment Scale

The Psychological Capital Assessment Scale (PCAS) created by Reena Rani and Menka Chowdhury was utilized in this investigation to assess students' Psychological Capital spanning 'four key dimensions': Hope, Self-Efficacy, Resilience, and Optimism. Psychological Capital constitutes "an individual's positive psychological state of development" and has been recognized as 'a crucial factor' in academic achievement and Student Engagement (Luthans et al., 2007; Seligman, 2011).

The original instrument was constructed to evaluate 'the four core components' of Psychological Capital as theorized by Luthans and colleagues: Hope (characterized by goal-directed energy and pathways thinking), Self-Efficacy (reflecting confidence in one's capability to succeed), Resilience (representing capacity to recover from adversity), and Optimism (embodying positive attribution style regarding future success) (Luthans et al., 2007; Snyder et al., 1991; Bandura, 1997; Masten, 2001; Seligman, 2006).

Considering 'the critical importance' of Psychological Capital in academic achievement and student well-being, especially within 'the Indian educational context,' 'a comprehensive validation process' was implemented to guarantee 'the psychometric adequacy' of the instrument for 'the current study population.' The validation procedure encompassed 'multiple stages': preliminary psychometric assessment of the original 34-item instrument through "Exploratory Factor Analysis'(EFA)' and "Confirmatory Factor Analysis'(CFA),' succeeded by 'a systematic refinement process' aimed at enhancing measurement efficiency while preserving 'construct validity' across all four dimensions.

3.7.4.2 Psychometric Validation of the Original 34-Item PCAS

‘Exploratory Factor Analysis’(EFA)

Objectives and Rationale: The primary aim of the ‘Exploratory Factor Analysis’ was to uncover the latent ‘factor structure’ of the original 34-item PCAS and determine whether the observed items align with the theoretical four-factor structure of psychological capital. EFA was chosen as the initial analytical approach to explore the underlying dimensionality without imposing a priori constraints on the factor structure (Fabrigar et al., 1999; Costello & Osborne, 2005).

Methodology: The EFA was conducted using a robust methodological framework designed to ensure reliable and interpretable results:

- **Sample Size:** A total of 420 participants were included in the analysis, providing an excellent participant-to-item ratio of 12.4:1, which substantially exceeds the

recommended minimum of 10:1 for factor analysis (Nunnally & Bernstein, 1994; MacCallum et al., 1999).

- **Extraction Method:** ‘Principal Component Analysis’ (PCA) with Varimax rotation was employed to maximize the interpretability of the factor structure while maintaining orthogonality between factors (Kaiser, 1958; Tabachnick & Fidell, 2019).
- **Criteria for Factor Retention:** Multiple criteria were applied to determine the ‘optimal number of factors’:
 - ‘Eigenvalues’ greater than 1.0 (Kaiser criterion)
 - Scree plot analysis for visual inspection of factor retention
 - Minimum factor loadings ≥ 0.40 for item retention (Stevens, 2009)
- **‘Sampling Adequacy Assessment’:** Prior to conducting the factor analysis, the ‘appropriateness’ of the data for ‘factorization’ was rigorously assessed using established statistical criteria:

Table 3.22 ‘KMO’ and Bartlett's Test for ‘Sampling Adequacy’ (34-Item PCAS)

Test	Value	Interpretation
‘Kaiser-Meyer-Olkin Measure of Sampling Adequacy’	.963	Excellent
‘Bartlett's Test of Sphericity’		
‘Approx. Chi-Square’	13670.658	
df	561	
Significance	.000	Highly Significant

Note. N = 1,605. KMO value $> .90$ indicates excellent ‘sampling adequacy’ for ‘factor analysis’. ‘Bartlett's test’ significance ($p < .001$) confirms that correlations are sufficiently large for factor analysis.

The Kaiser-Meyer-Olkin measure yielded a value of 0.963, demonstrating 'excellent sampling adequacy' that considerably surpassed the conventionally accepted minimum threshold of 0.60 (Kaiser, 1974). The Bartlett's sphericity test produced statistically significant results ($p < 0.001$), thereby validating that the intercorrelation matrix possessed appropriate characteristics for conducting 'factor analysis' through the rejection of the hypothesis proposing that the correlation matrix represents an identity matrix (Bartlett, 1954).

Factor Extraction Results: The factor extraction process revealed a clear four-factor structure for the PCAS, consistent with the theoretical framework of psychological capital:

Table 3.23: ‘Total Variance Explained’ by ‘Principal Component Analysis’ (34-Item PCAS)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.407	36.492	36.492	6.877	20.226	20.226
2	5.537	16.285	52.777	6.841	20.121	40.348
3	4.823	14.185	66.962	6.118	17.993	58.341
4	3.141	9.238	76.200	6.072	17.859	76.200
5	.419	1.234	77.434			
6	.396	1.163	78.597			
7	.387	1.138	79.736			
8	.375	1.102	80.837			
9	.371	1.090	81.928			
10	.348	1.024	82.951			

Note. Only first 10 components are shown. The complete analysis included all 34 components.

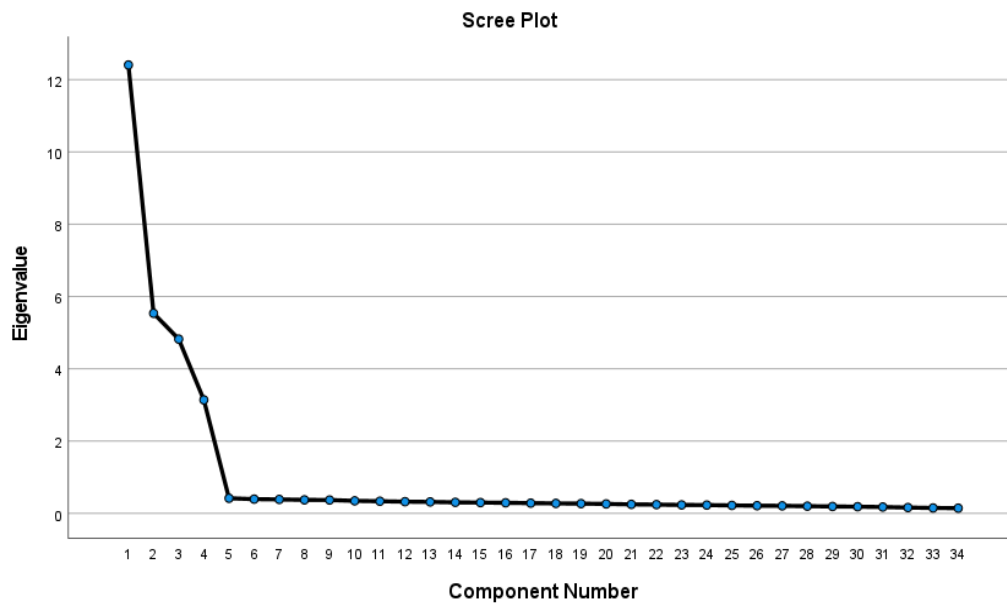
Key Findings:

1.Four-Factor Structure: Based on the scree plot analysis and eigenvalues > 1 criterion, a four-factor solution was clearly identified, consistent with the theoretical structure of psychological capital.

2.Variance Explained: The four factors collectively accounted for 76.200% of the aggregate variance, which represents an excellent proportion for 'a multidimensional scale' within social science research contexts (Hair et al., 2019).

3.Factor Loadings: The complete set of 34 items exhibited robust loadings on their corresponding factors, with loading values spanning from 0.814 to 0.885, as presented in 'the rotated component matrix.'

Figure 3.8: Scree Plot for 34-Item PCAS Factor Analysis



Rotated Component Matrix: The rotated component matrix revealed clear factor structure with items loading appropriately on their theoretical dimensions:

Table 3.24: Rotated Component Matrix for 34-Item PCAS

Item	Component 1	Component 2	Component 3	Component 4
Item1	.174	.848	.116	.092
Item2	.217	.831	.149	.108
Item3	.076	.124	.846	.137
Item4	.064	.133	.861	.123
Item5	.140	.087	.123	.851
Item6	.115	.054	.134	.854
Item7	.838	.207	.032	.146
Item8	.845	.190	.103	.124
Item9	.165	.827	.169	.109
Item10	.157	.843	.143	.071
Item11	.148	.083	.100	.832
Item12	.144	.091	.146	.847
Item13	.019	.164	.858	.140
Item14	.029	.163	.824	.164

Item	Component 1	Component 2	Component 3	Component 4
Item15	.846	.190	.045	.152
Item16	.850	.195	.045	.142
Item17	.058	.088	.885	.070
Item18	.057	.181	.834	.109
Item19	.218	.827	.174	.042
Item20	.218	.842	.125	.005
Item21	.140	.089	.123	.853
Item22	.150	.097	.113	.831
Item23	.827	.174	.020	.138
Item24	.852	.202	.054	.117
Item25	.050	.112	.849	.101
Item26	.003	.130	.848	.173
Item27	.125	.037	.120	.836
Item28	.120	.074	.154	.854
Item29	.202	.826	.129	.059
Item30	.179	.846	.120	.097
Item31	.840	.165	.008	.156
Item32	.857	.166	.061	.106
Item33	.211	.841	.105	.108
Item34	.814	.225	.036	.117

Note. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. All loadings > .40 on primary factors.

Dimension-wise Reliability Analysis: The ‘internal consistency’ reliability was assessed for each of the four dimensions of psychological capital:

Table 3.25: Dimension-wise Cronbach's Alpha for Original 34-Item PCAS (N = 420)

Dimension	Number of Items	Cronbach's Alpha	Interpretation
Hope	8	.955	Excellent
Self-Efficacy	9	.961	Excellent

Dimension	Number of Items	Cronbach's Alpha	Interpretation
Resilience	9	.961	Excellent
Optimism	8	.953	Excellent
Total PCAS	34	.947	Excellent

Note. All reliability coefficients substantially exceed the acceptable threshold of 0.70, indicating excellent internal consistency for all dimensions (George & Mallery, 2003).

Composite Reliability for Original Scale:

Composite reliability was calculated for each dimension to provide a more accurate estimate of internal consistency:

Table 3.26: Composite Reliability for Original 34-Item PCAS Dimensions

Dimension	Composite Reliability	Interpretation
Hope	.956	Excellent
Self-Efficacy	.962	Excellent
Resilience	.962	Excellent
Optimism	.954	Excellent
Total PCAS	.948	Excellent

Note. Composite reliability values $> .90$ indicate excellent reliability (Hair et al., 2019).

‘Confirmatory Factor Analysis’ (CFA)

Objectives and Model Specification: Following the EFA results, a ‘Confirmatory Factor Analysis’ was conducted to validate the four-factor structure of the PCAS and assess the ‘overall fit’ of the hypothesized model. The CFA approach allows for rigorous testing of the ‘factor structure’ identified in the ‘exploratory phase’ while providing comprehensive fit assessment (Brown, 2015; Byrne, 2016).

Methodology:

- Sample: The same sample of 420 participants was used for CFA to maintain consistency and allow for direct comparison with EFA results
- Software: Analysis was conducted using AMOS 26 with Maximum Likelihood

Estimation (MLE)

- Model Specification:
- Four latent factors representing Hope, Self-Efficacy, Resilience, and Optimism
- 34 observed variables corresponding to the PCAS items
- Error terms associated with each observed variable
- Correlations between the four latent factors

Model Fit Assessment: The CFA results demonstrated excellent fit across multiple categories of fit indices:

Table 3.27: ‘Confirmatory Factor Analysis ‘Fit Indices for 34-Item PCAS (N = 420)

Fit Index	Value	Recommended Threshold	Interpretation
Chi-Square (CMIN)	562.215	-	-
Degrees of Freedom (df)	521	-	-
p-value	0.103	> 0.05	Non-significant (good fit)
CMIN/DF	1.079	< 3.0	‘Excellent’
RMSEA	0.015	≤ 0.06	‘Excellent’
CFI	0.997	≥ 0.95	‘Excellent’
TLI	0.997	≥ 0.95	‘Excellent’
IFI	0.997	≥ 0.90	‘Excellent’
NFI	0.960	≥ 0.90	‘Excellent’
RFI	0.957	≥ 0.90	‘Excellent’
RMR	0.028	≤ 0.08	‘Excellent’
GFI	0.930	≥ 0.90	Good
AGFI	0.921	≥ 0.90	Good
PGFI	0.815	> 0.50	Acceptable

Note. Thresholds based on Hu & Bentler (1999), Kline (2016), and Byrne (2016).

Standardized Factor Loadings: All items demonstrated significant and substantial loadings on their respective latent factors:

Table 3.28: Standardized Factor Loadings for 34-Item PCAS by Dimension

Hope Dimension	Loading	Self-Efficacy Dimension	Loading
Item3	.848	Item1	.860
Item4	.866	Item2	.864
Item25	.839	Item9	.845
Item13	.870	Item10	.852
Item14	.832	Item19	.856
Item17	.872	Item20	.860
Item18	.837	Item29	.842
Item26	.856	Item30	.861
		Item33	.864
Resilience Dimension	Loading	Optimism Dimension	Loading
Item7	.860	Item5	.856
Item8	.863	Item6	.854
Item15	.868	Item11	.829
Item16	.872	Item12	.858
Item23	.834	Item21	.860
Item24	.870	Item22	.835
Item31	.849	Item27	.829
Item32	.863	Item28	.863
Item34	.831		

Note. All factor loadings were statistically significant ($p < .001$). Loadings ranged from .829 to .872, all exceeding the recommended minimum of .50.

Inter-factor Correlations: The correlations between the four psychological capital dimensions were moderate, supporting both convergent and discriminant validity:

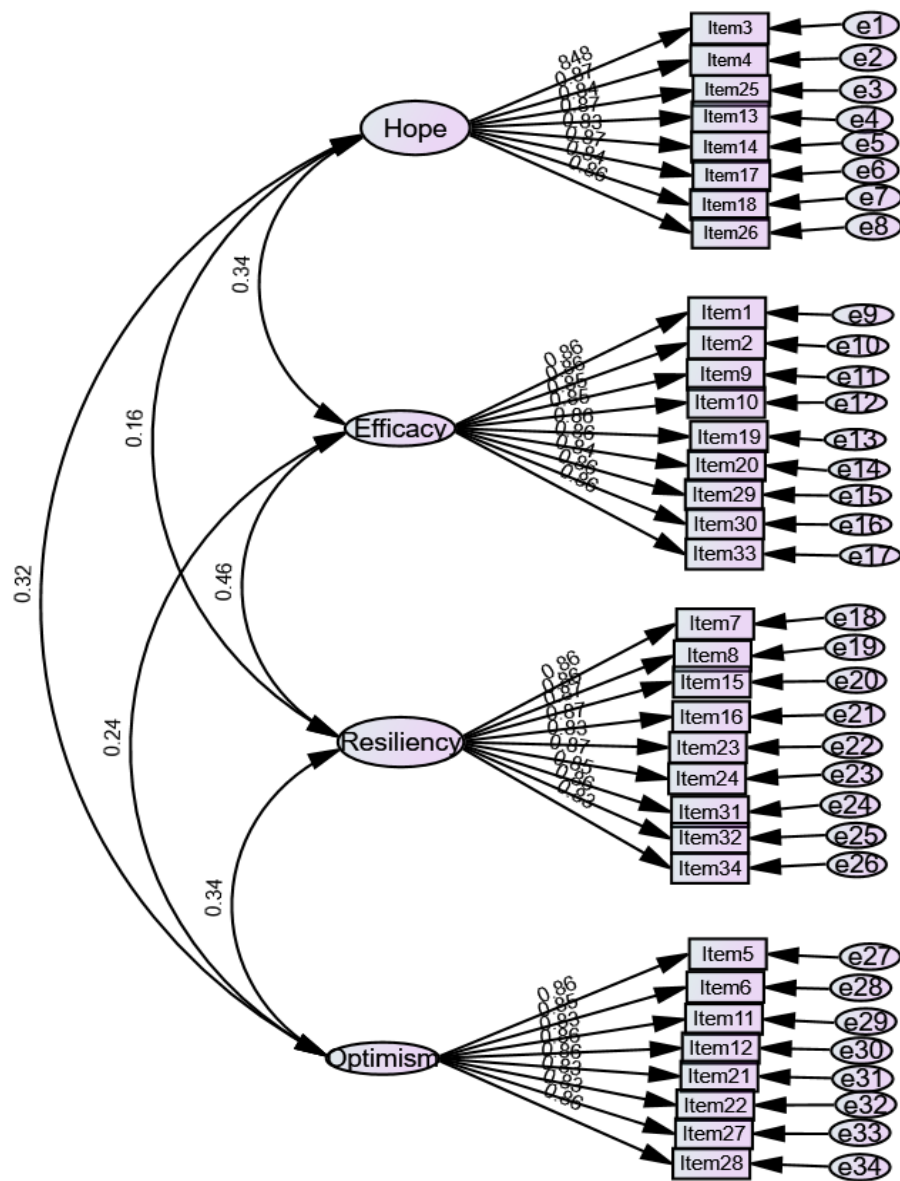
Table 3.29: Inter-factor Correlations for 34-Item PCAS

Factor	Hope	Self-Efficacy	Resilience	Optimism
Hope	1.000			
Self-Efficacy	.299***	1.000		

Factor	Hope	Self-Efficacy	Resilience	Optimism
Resilience	.145**	.412***	1.000	
Optimism	.275***	.205***	.294***	1.000

Note. **p < .01, ***p < .001. Correlations indicate related but distinct constructs.

Figure 3.9: Path Diagram for CFA of 34-Item PCAS



3.7.4.3 Scale Refinement Process

Rationale for Scale Refinement

Based on the excellent psychometric properties demonstrated by the 34-item PCAS, a systematic refinement process was undertaken to enhance practical utility while maintaining construct validity across all four dimensions. The refinement was motivated by several theoretical and practical considerations:

- 1.Measurement Efficiency: Reducing respondent burden while maintaining measurement precision across all four psychological capital dimensions (DeVellis, 2017)
- 2.Practical Utility: Creating a more manageable instrument for large-scale educational research applications
- 3.Psychometric Optimization: Retaining the most informative items while eliminating redundancy within each dimension (Clark & Watson, 1995)
- 4.Model Stability: Ensuring adequate representation of each factor for stable CFA models (Brown, 2015)

Refinement Methodology

The refinement process employed a balanced approach that combined both statistical and conceptual criteria to ensure optimal scale performance while maintaining the four-factor structure:

Statistical Criteria for Item Selection: The primary statistical criterion for item retention was factor loading magnitude from the initial CFA, which ranged from 0.829 to 0.872. Items demonstrating stronger relationships with their respective constructs were given preference during the selection process (Comrey & Lee, 1992; Tabachnick & Fidell, 2019).

Conceptual Criteria for Content Coverage: The conceptual criteria ensured comprehensive coverage of each psychological capital dimension:

- 1.Domain Coverage: Ensuring each of the four factors (Hope, Self-Efficacy, Resilience, Optimism) maintained adequate representation
- 2.Item Clarity: Prioritizing items with clear, unambiguous content that effectively captured the essence of each dimension
- 3.Minimum Factor Representation: A minimum of three items per factor was deemed necessary for stable CFA models (Brown, 2015)

Final Item Distribution: The systematic application of these criteria resulted in a refined 15-item scale with the following distribution:

- Resilience: 6 items (highest loading items retained due to strong psychometric properties)
- Hope: 3 items (minimum required for factor stability)
- Self-Efficacy: 3 items (minimum required for factor stability)

- Optimism: 3 items (minimum required for factor stability)

3.7.4.4 Validation of the Refined 15-Item PCAS

‘Confirmatory Factor Analysis’ of the Refined Scale

The structural validity of the refined 15-item PCAS was rigorously examined through ‘Confirmatory Factor Analysis’ using data from 240 participants. This separate validation sample ensured independent verification of the refined scale's psychometric properties (Worthington & Whittaker, 2006).

Methodology:

- Sample: 240 participants (independent validation sample)
- Software: AMOS 26 with Maximum Likelihood Estimation (MLE)
- Model Specification: Four-factor model with 15 items distributed across ‘Hope’ (3 items), ‘Self-Efficacy’ (3 items), ‘Resilience’ (6 items), and ‘Optimism’ (3 items)

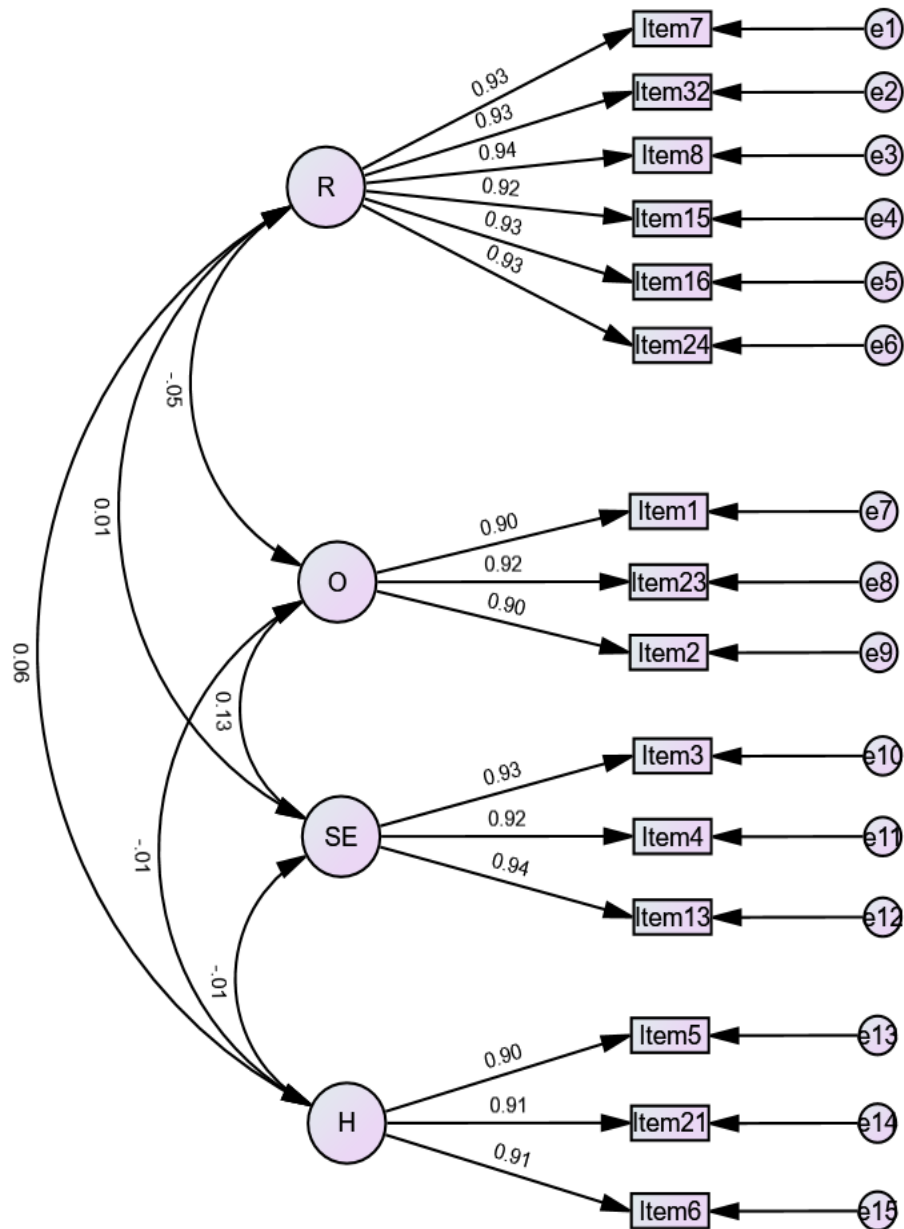
Model Fit Results: The CFA results demonstrated excellent fit to the data across multiple fit indices:

Table 3.30: ‘Confirmatory Factor Analysis’ Fit Indices for the Refined 15-Item PCAS (N = 240)

Fit Index	Value	Recommended Threshold	Interpretation
Chi-square (χ^2)	102.210	-	-
Degrees of Freedom (df)	84	-	-
χ^2/df	1.217	< 3.0	Excellent
CFI	0.995	$\geq .95$	Excellent
TLI	0.994	$\geq .95$	Excellent
RMSEA	0.030	$\leq .06$	Excellent
90% CI for RMSEA	[.000, .049] Lower $\leq .05$, Upper < .08		Excellent
PCLOSE	0.961	> .05	Excellent
SRMR	0.023	$\leq .08$	Excellent
GFI	0.948	$\geq .90$	Good
AGFI	0.925	$\geq .90$	Good

Note. Thresholds based on Hu & Bentler (1999) and Kline (2016).

Figure 3.10: Path Diagram for CFA of the 15-Item Refined PCAS



Reliability and Factor Loadings of the Refined Scale

Internal Consistency Reliability: The ‘internal consistency reliability’ of the refined 15-item

PCAS was assessed using ‘Cronbach's alpha coefficient’ for both the total scale and individual subscales:

Table 3.31: Internal Consistency Reliability for the Refined 15-Item PCAS (N = 240)

Scale/Subscale	N of Items	Cronbach's Alpha	Interpretation
PCAS Total Score	15	.798	Acceptable
Resilience	6	.974	Excellent
Optimism	3	.931	Excellent
Self-Efficacy	3	.951	Excellent
Hope	3	.933	Excellent

Note. Interpretation based on George & Mallery (2003): $\alpha \geq .9$ = Excellent, $\alpha \geq .8$ = Good, $\alpha \geq .7$ = Acceptable.

Composite Reliability for Refined Scale:

Composite reliability was calculated for each dimension and the total scale to provide accurate estimates of internal consistency:

Table 3.32: Composite Reliability for Refined 15-Item PCAS Dimensions

Scale/Subscale	Composite Reliability	Interpretation
PCAS Total Score	.801	Good
Resilience	.975	Excellent
Optimism	.932	Excellent
Self-Efficacy	.952	Excellent
Hope	.934	Excellent

Note. Composite reliability values $> .90$ indicate excellent reliability, $> .80$ indicate good reliability (Hair et al., 2019).

Factor Loadings and Item Performance: The factor loadings for all items in the refined scale demonstrated strong relationships with their respective constructs:

Table 3.33: Items and Standardized Factor Loadings for the Refined 15-Item PCAS

Factor	Item No.	Item Content	Loading
Resilience	Item7	I usually expect the best, when result seems to me uncertain.	.86

Factor	Item No.	Item Content	Loading
Optimism	Item32	If face failure, I work hard to get success.	.85
	Item8	If something goes wrong for me, I try hard.	.84
	Item15	Failures motivate me to go ahead without any break.	.83
	Item16	Looking on the brighter side of everything concerning with my studies help me in achieving good result.	.83
	Item24	I am strong believer of the fact that 'Hard work always pays'.	.83
	Item1	I feel confident in participating in class discussion.	.86
	Item23	I am very positive about my future.	.84
	Item2	I am confident in finding the solution to any problem.	.84
	Item3	I could think divergently to find the solution whenever any problem encounters.	.87
Self-Efficacy	Item4	I feel every problem have solutions.	.85
	Item13	I feel I enjoy good position in class.	.83
	Item5	I never face difficulties in managing my works.	.86
Hope	Item21	I can think of many solutions for a given problem.	.84
	Item6	I take that work only in which I feel, I can give my best.	.84

Note. All unstandardized regression weights from CFA were statistically significant ($p < .001$). Loadings ranged from .83 to .87, all exceeding the recommended minimum of .50.

Discriminant Validity Evidence: The inter-factor correlations for the refined scale were low (all below 0.12) and non-significant ($p > .05$), providing strong evidence for the ‘discriminant validity’ of the four ‘psychological capital’ dimensions. This finding supports the theoretical conceptualization of ‘Hope’, ‘Self-Efficacy’, ‘Resilience’, and ‘Optimism’ as related but distinct constructs (Luthans et al., 2007).

3.7.4.5 Validity Evidence for the PCAS

Content Validity

The ‘content validity’ of the PCAS was established through multiple sources of evidence:

1. Expert Review: The original scale development by Rani and Chowdhury involved expert

review to ensure comprehensive coverage of psychological capital domains

2.Theoretical Alignment: The scale items align with established frameworks of psychological capital, particularly Luthans et al.'s (2007) four-factor model

3.Content Domain Coverage: The refined scale maintains representation across all four key dimensions of psychological capital

Construct Validity

The construct validity was supported through multiple sources of evidence:

1.Structural Validity: The excellent fit of both the 34-item and 15-item CFA models provided strong evidence for structural validity (AERA et al., 2014)

2.Convergent Validity: The significant and substantial factor loadings demonstrated convergent validity within each dimension (Campbell & Fiske, 1959)

3.Discriminant Validity: The low inter-factor correlations in the refined scale provided evidence for discriminant validity between dimensions

4.Internal Structure: The high internal consistency reliability for each dimension provided additional evidence for construct homogeneity (Cronbach, 1951)

Cultural Appropriateness

The validation process confirmed the cultural appropriateness of the PCAS for the Indian educational context. The items reflected psychological capital concepts that are meaningful and relevant within the West Bengal secondary school system, ensuring ecological validity (Bronfenbrenner, 1979; Sue, 1999).

3.7.4.6 Summary of PCAS Validation

The comprehensive validation of the Psychological Capital Assessment Scale demonstrated excellent psychometric properties across both the original 34-item version and the refined 15-item version. The systematic validation process included:

1.Initial Validation (N = 420): EFA and CFA of the 34-item scale demonstrated four-factor structure with excellent fit indices and strong factor loadings (.829-.872) across all dimensions

2.Scale Refinement: Systematic reduction to 15 items using combined statistical and conceptual criteria while maintaining all four psychological capital dimensions

3.Independent Validation (N = 240): CFA of the refined 15-item scale confirmed excellent psychometric properties with superior fit indices and strong dimension-specific reliability

The final 15-item PCAS provides a reliable, valid, and efficient measure of psychological capital that is culturally appropriate for secondary school students in West Bengal. The scale maintains comprehensive coverage of all four psychological capital dimensions while offering practical advantages for research applications.

Key Psychometric Achievements:

- Four-factor structure confirmed through both EFA and CFA
- Excellent dimension-specific reliability ($\alpha = .931-.974$ for refined scale dimensions)
- Strong convergent validity (all loadings $> .83$)
- Strong discriminant validity (low inter-factor correlations in refined scale)
- Measurement efficiency through systematic refinement process (56% reduction in items)
- Maintained theoretical integrity across all four psychological capital dimensions

3.7.5 Student Engagement Scale

Instrument: Student Engagement Scale by Prof. (Dr.) Hemant Lata Sharma and Ms. Manasi Chowdhry

Purpose: The Student Engagement Scale was employed to measure academic engagement among secondary school students.

Structure: The questionnaire contains 30 items distributed in three dimensions:

- **Cognitive Engagement:** 'Mental investment in learning and strategy use'
- **Emotional Engagement:** 'Feelings and attitudes toward learning and school'
- **Behavioral Engagement:** 'Participation and involvement in academic activities'

Scoring: The scale is a five-point Likert type scale, validated, standardized and ready to use. The total score varies from 66 to 1334 showing extremely low and high level of students engagement. For the present study, solely the composite score of the construct will be utilized. Psychometric Properties: The scale has been validated and standardized for use with secondary school students (Sharma & Chowdhry, 2015).

3.7.5.1 Validation of the 'Student Engagement Scale' (SES)

Overview of the Student Engagement Scale

The Student Engagement Scale (SES) developed by Prof. (Dr.) Hemant Lata Sharma and Ms. Manasi Chowdhry was employed in this study to measure students' engagement across three key dimensions. Student engagement represents "the quality of effort students themselves devote to educationally purposeful activities that contribute directly to desired outcomes" (Hu & McCormick, 2012; Kuh, 2009).

The original scale was designed to assess three core components of student engagement as conceptualized in educational psychology literature: Learning Strategies and Cognitive Engagement (deep learning approaches and metacognitive strategies), Social and Emotional

Engagement (interpersonal connections and emotional investment in learning), and Behavioral Engagement and Persistence (active participation and sustained effort) (Fredricks et al., 2004; Appleton et al., 2008; Reeve & Tseng, 2011).

Given the critical importance of student engagement in academic achievement and educational outcomes, particularly in the Indian educational context, a comprehensive validation process was undertaken to ensure the psychometric adequacy of the instrument for the current study population. The validation process involved multiple stages: initial psychometric evaluation of the original 30-item scale through ‘Exploratory Factor Analysis’(EFA) and ‘Confirmatory Factor Analysis’(CFA), followed by a systematic refinement process to improve measurement efficiency while maintaining construct validity across all three dimensions.

3.7.5.2 Psychometric Validation of the Original 30-Item SES

‘Exploratory Factor Analysis’(EFA)

Objectives and Rationale: The primary aim of the ‘Exploratory Factor Analysis’ was to uncover the latent factor structure of the original 30-item SES and determine whether the observed items align with the theoretical three-factor structure of student engagement. EFA was chosen as the initial analytical approach to explore the underlying dimensionality without imposing a priori constraints on the factor structure (Fabrigar et al., 1999; Costello & Osborne, 2005).

Methodology: The EFA was conducted using a robust methodological framework designed to ensure reliable and interpretable results:

- **Sample Size:** A total of 420 respondents were included in the analysis, providing an excellent participant-to-item ratio of 14:1, which substantially exceeds the recommended minimum of 10:1 for factor analysis (Nunnally & Bernstein, 1994; MacCallum et al., 1999).
- **Extraction Method:** ‘Principal Component Analysis’ (PCA) with ‘Varimax rotation’ was employed to maximize the interpretability of the factor structure while maintaining orthogonality between factors (Kaiser, 1958; Tabachnick & Fidell, 2019).
- **Criteria for Factor Retention:** Multiple criteria were applied to determine the optimal number of factors:
 - ‘Eigenvalues’ greater than 1.0 (Kaiser criterion)
 - Scree plot analysis for visual inspection of factor retention
 - Explained variance $\geq 60\%$
 - Minimum factor loadings ≥ 0.40 for item retention (Stevens, 2009)
- **Sampling Adequacy Assessment:** Prior to conducting the factor analysis, the appropriateness of the data for factorization was rigorously assessed using established

statistical criteria:

Table 3.34: KMO and Bartlett's Test for Sampling Adequacy (30-Item SES)

Test	Value	Interpretation
Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.972	Excellent
Bartlett's Test of Sphericity - Approx. Chi-Square	13285.526	
Df	435	
Significance	.000	Highly Significant

The Kaiser-Meyer-Olkin measure yielded a value of 0.972, demonstrating 'excellent sampling adequacy' that considerably surpassed the conventionally accepted minimum threshold of 0.60 and closely approached the theoretical maximum of 1.0 (Kaiser, 1974). The Bartlett's sphericity test produced statistically significant results ($p < 0.001$), thereby validating that the intercorrelation matrix possessed appropriate characteristics for conducting 'factor analysis' through the rejection of the hypothesis proposing that the correlation matrix represents an identity matrix (Bartlett, 1954).

Communalities Assessment: The communalities after extraction ranged from 0.750 to 0.806, indicating that all items are well-represented by the three extracted factors and exceed the standard threshold of 0.4, confirming the appropriateness of the factor structure.

Table 3.35: Communalities for 30-Item SES

Item	Initial	Extraction	Item	Initial	Extraction	Item	Initial	Extraction
Factor1_Item 1	1.000	.806	Factor2_Item 1	1.000	.763	Factor3_Item 1	1.000	.750
Factor1_Item 2	1.000	.775	Factor2_Item 2	1.000	.773	Factor3_Item 2	1.000	.759
Factor1_Item 3	1.000	.786	Factor2_Item 3	1.000	.795	Factor3_Item 3	1.000	.762
Factor1_Item 4	1.000	.801	Factor2_Item 4	1.000	.787	Factor3_Item 4	1.000	.763
Factor1_Item 5	1.000	.775	Factor2_Item 5	1.000	.762	Factor3_Item 5	1.000	.776
Factor1_Item 6	1.000	.787	Factor2_Item 6	1.000	.782	Factor3_Item 6	1.000	.752

Item	Initial	Extraction	Item	Initial	Extraction	Item	Initial	Extraction
6	0		6	0		6	0	
Factor1_Item	1.00	.785	Factor2_Item	1.00	.756	Factor3_Item	1.00	.774
7	0		7	0		7	0	
Factor1_Item	1.00	.772	Factor2_Item	1.00	.778	Factor3_Item	1.00	.774
8	0		8	0		8	0	
Factor1_Item	1.00	.774	Factor2_Item	1.00	.790	Factor3_Item	1.00	.785
9	0		9	0		9	0	
Factor1_Item	1.00	.781	Factor2_Item	1.00	.792	Factor3_Item	1.00	.776
10	0		10	0		10	0	

Note. All extraction communalities exceeded 0.750, indicating excellent representation by the extracted factors.

Factor Extraction Results: The factor extraction process revealed a clear three-factor structure for the SES, consistent with the theoretical framework of student engagement:

Table 3.36: Total Variance Explained by ‘Principal Component Analysis’(30-Item SES)

Component	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.016	40.054	40.054	7.830	26.099	26.099
2	5.974	19.912	59.967	7.774	25.914	52.013
3	5.301	17.670	77.637	7.687	25.623	77.637
4	.419	1.397	79.034			
5	.396	1.321	80.355			

Note. Only the first 5 components are shown. The complete analysis included all 30 components.

Key Findings:

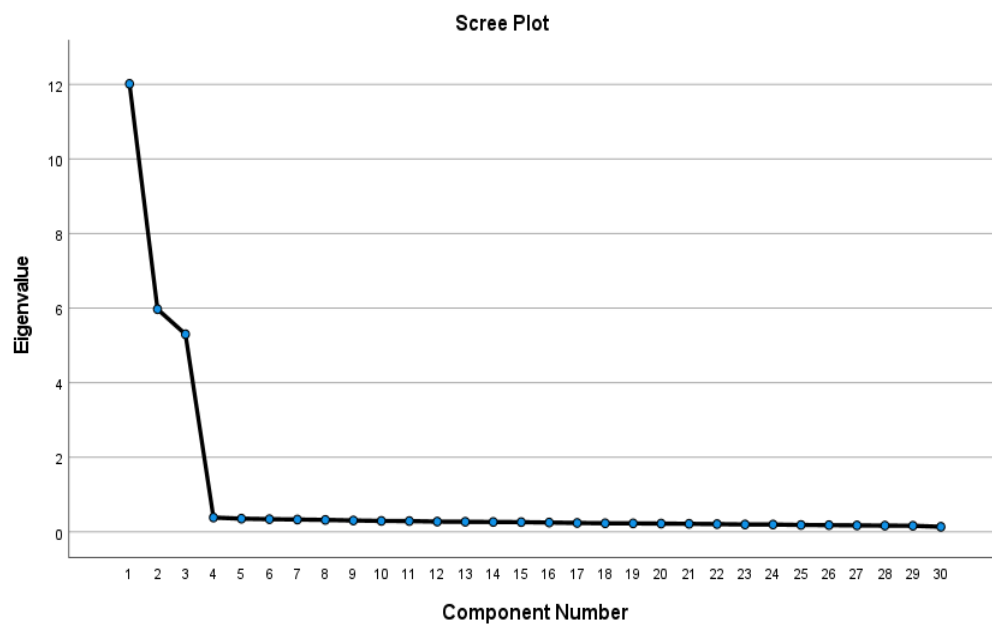
1.Three-Factor Structure: Based on the ‘scree plot analysis’ and ‘eigenvalues’ > 1 criterion, a three-factor solution was clearly identified, consistent with the theoretical structure of student

engagement.

2.Variance Explained: The three factors explained 77.637% of the ‘total variance’, which is considered excellent for a multidimensional scale in social science research (Hair et al., 2019).

3.Factor Loadings: All 30 items loaded strongly onto their respective factors, with minimal cross-loadings indicating a clean factor structure.

Figure 3.11: Scree Plot for 30-Item SES Factor Analysis



Rotated Component Matrix: The rotated component matrix revealed clear factor structure with items loading appropriately on their theoretical dimensions:

Table 3.37: Rotated Component Matrix for 30-Item SES (the Selected Items)

Item	Component 1	Component 2	Component 3
Factor1_Item1	.884	.095	.125
Factor1_Item4	.877	.125	.125
Factor1_Item6	.875	.109	.100
Factor1_Item3	.874	.126	.074
Factor1_Item7	.869	.138	.107
Factor1_Item10	.866	.154	.086
Factor1_Item5	.862	.139	.110
Factor1_Item9	.862	.134	.115
Factor1_Item2	.855	.173	.116

Item	Component 1	Component 2	Component 3
Factor1_Item8	.855	.192	.068
Factor2_Item3	.133	.878	.076
Factor2_Item4	.148	.873	.042
Factor2_Item10	.119	.873	.123
Factor2_Item9	.118	.871	.132
Factor2_Item6	.163	.864	.092
Factor2_Item8	.150	.859	.132
Factor2_Item2	.127	.858	.142
Factor2_Item7	.122	.855	.106
Factor2_Item1	.133	.854	.127
Factor2_Item5	.165	.852	.092
Factor3_Item5	.061	.089	.874
Factor3_Item9	.120	.130	.868
Factor3_Item3	.072	.083	.866
Factor3_Item7	.104	.117	.866
Factor3_Item10	.113	.118	.866
Factor3_Item2	.087	.083	.863
Factor3_Item4	.111	.088	.862
Factor3_Item8	.125	.134	.860
Factor3_Item6	.109	.084	.856
Factor3_Item1	.101	.113	.853

Note. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Factor loadings > .85 for primary factors, minimal cross-loadings.

‘Confirmatory Factor Analysis’(CFA)

Objectives and Model Specification: Following the EFA results, a ‘Confirmatory Factor Analysis’ was conducted to validate the three-factor structure of the SES and assess the overall fit of the hypothesized model. The CFA approach allows for rigorous testing of the factor structure identified in the exploratory phase while providing comprehensive fit assessment (Brown, 2015; Byrne, 2016).

Methodology:

- Sample: The same sample of 420 participants was used for CFA to maintain consistency and allow for direct comparison with EFA results
- Software: Analysis was conducted using ‘AMOS 26’ with ‘Maximum Likelihood Estimation’ (MLE)
- Model Specification:
 - Three latent factors representing Learning Strategies/Cognitive Engagement, Social/Emotional Engagement, and Behavioral Engagement/Persistence
 - 30 observed variables corresponding to the SES items
 - Error terms associated with each observed variable
 - Correlations between the three latent factors

Model Fit Assessment: The CFA results demonstrated excellent fit across multiple categories of fit indices:

Table 3.38: ‘Confirmatory Factor Analysis’ Fit Indices for 30-Item SES (N = 420)

Fit Index	Value	Recommended Threshold	Interpretation
Chi-Square (CMIN)	403.588	-	-
Degrees of Freedom (df)	402	-	-
p-value	0.468	> 0.05	Non-significant (excellent fit)
CMIN/DF	1.004	< 3.0	‘Excellent’
RMSEA	0.003	≤ 0.06	‘Excellent’
RMSEA 90% CI	[0.000, 0.018]	Lower ≤ 0.05, Upper < 0.08	‘Excellent’
PCLOSE	1.000	> 0.05	‘Excellent’
CFI	1.000	≥ 0.95	‘Excellent’
TLI	1.000	≥ 0.95	‘Excellent’
IFI	1.000	≥ 0.90	‘Excellent’
NFI	0.970	≥ 0.90	‘Excellent’
RFI	0.968	≥ 0.90	‘Excellent’
RMR	0.039	≤ 0.08	‘Excellent’

GFI	0.941	≥ 0.90	‘Excellent’
AGFI	0.931	≥ 0.90	‘Excellent’
PGFI	0.813	> 0.50	Acceptable

Note. Thresholds based on Hu & Bentler (1999), Kline (2016), and Byrne (2016).

Standardized Factor Loadings: All items demonstrated significant and substantial loadings on their respective latent factors:

Table 3.39: Standardized Factor Loadings for 30-Item SES by Dimension

Factor 1: Learning Strategies/Cognitive Engagement	Loading
Factor1_Item1	.884
Factor1_Item2	.865
Factor1_Item3	.871
Factor1_Item4	.883
Factor1_Item5	.865
Factor1_Item6	.873
Factor1_Item7	.873
Factor1_Item8	.862
Factor1_Item9	.865
Factor1_Item10	.870
Factor 2: Social/Emotional Engagement	Loading
Factor2_Item1	.857
Factor2_Item2	.864
Factor2_Item3	.878
Factor2_Item4	.869
Factor2_Item5	.857
Factor2_Item6	.870
Factor2_Item7	.853
Factor2_Item8	.869
Factor2_Item9	.876
Factor2_Item10	.877

Factor 3: Behavioral Engagement/Persistence	Loading
Factor3_Item1	.849
Factor3_Item2	.854
Factor3_Item3	.856
Factor3_Item4	.858
Factor3_Item5	.865
Factor3_Item6	.850
Factor3_Item7	.867
Factor3_Item8	.865
Factor3_Item9	.874
Factor3_Item10	.868

Note. All the factor loadings were statistically significant ($p < .001$). Loadings ranged from .849 to .884, all exceeding the recommended minimum of .50.

Inter-factor Correlations:

The correlations between the three student engagement dimensions were moderate, supporting both convergent and discriminant validity:

Table 3.40: Inter-factor Correlations for 30-Item SES

Factor	Factor 1	Factor 2	Factor 3
Factor 1 (Learning Strategies/Cognitive Engagement)	1.000		
Factor 2 (Social/Emotional Engagement)	.330***	1.000	
Factor 3 (Behavioral Engagement/Persistence)	.254***	.262***	1.000

Note. *** $p < .001$. Correlations indicate related but distinct constructs.

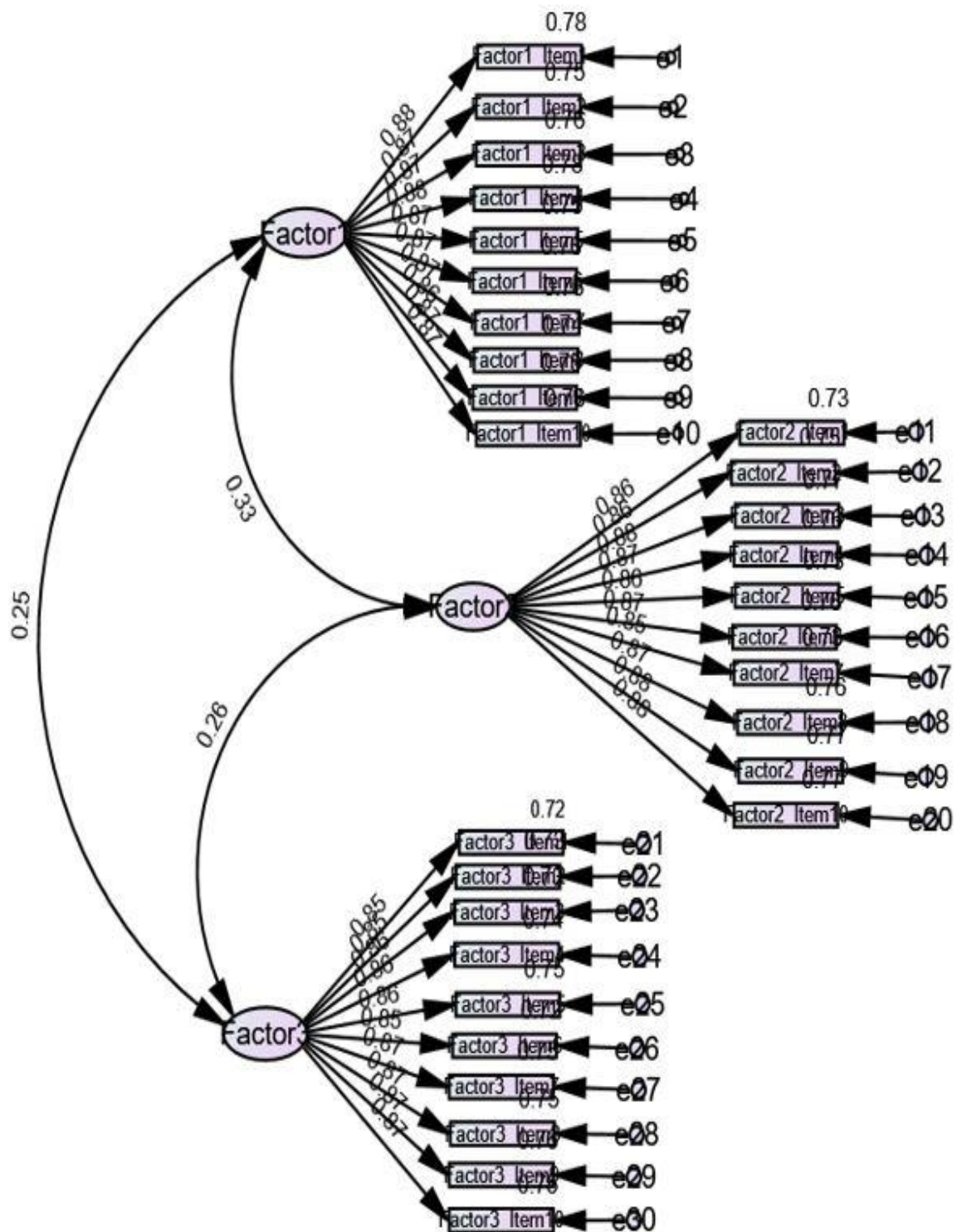


Figure 3.12: Path Diagram for CFA of 30-Item SES

Composite Reliability for Original Scale: Composite reliability was calculated for each dimension to provide accurate estimates of internal consistency:

Table 3.41: Composite Reliability for Original 30-Item SES Dimensions

Dimension	Composite Reliability	Interpretation
Learning Strategies/Cognitive Engagement	.97	‘Excellent’
Social/Emotional Engagement	.96	‘Excellent’
Behavioral Engagement/Persistence	.96	‘Excellent’
Total SES	.98	‘Excellent’

Note. Composite reliability values > .90 indicate excellent reliability (Hair et al., 2019).

3.7.5.3 Scale Refinement Process

Rationale for Scale Refinement

Based on the excellent psychometric properties demonstrated by the 30-item SES, a systematic refinement process was undertaken to enhance practical utility while maintaining construct validity across all three dimensions. The refinement was motivated by several theoretical and practical considerations:

- 1.Measurement Efficiency: Reducing respondent burden while maintaining measurement precision across all three engagement dimensions (DeVellis, 2017)
- 2.Practical Utility: Creating a more manageable instrument for large-scale educational research applications
- 3.Psychometric Optimization: Retaining the most informative items while eliminating redundancy within each dimension (Clark & Watson, 1995)
- 4.Model Stability: Ensuring adequate representation of each factor for stable CFA models (Brown, 2015)

Refinement Methodology

The refinement process employed a balanced approach that combined both statistical and conceptual criteria to ensure optimal scale performance while maintaining the three-factor structure:

Statistical Criteria for Item Selection: The primary statistical criterion for item retention was factor loading magnitude from the initial CFA, which ranged from 0.849 to 0.884. Items demonstrating stronger relationships with their respective constructs were given preference

during the selection process, with all selected items having loadings > 0.86 (Comrey & Lee, 1992; Tabachnick & Fidell, 2019).

Conceptual Criteria for Content Coverage: The conceptual criteria ensured comprehensive coverage of each student engagement dimension:

- 1) **Domain Coverage:** Ensuring each of the three factors maintained adequate representation of their theoretical domains
- 2) **Item Clarity:** Prioritizing items with clear, unambiguous content that effectively captured the essence of each dimension
- 3) **Balanced Factor Representation:** Four items per factor was deemed optimal for stable CFA models while maintaining content validity (Brown, 2015)

Final Item Distribution: The systematic application of these criteria resulted in a refined 12-item scale with equal distribution:

- ‘Learning Strategies/Cognitive Engagement’: 4 items
- ‘Social/Emotional Engagement’: 4 items
- ‘Behavioral Engagement/Persistence’: 4 items

3.7.5.4 Validation of the Refined 12-Item SES

‘Confirmatory Factor Analysis ‘of the Refined Scale

The structural validity of the refined 12-item SES was rigorously examined through ‘Confirmatory Factor Analysis ‘using data from 240 participants. This separate validation sample ensured independent verification of the refined scale's psychometric properties (Worthington & Whittaker, 2006).

Methodology:

- Sample: 240 participants (independent validation sample)
- Software: ‘AMOS 26’ with ‘Maximum Likelihood Estimation’ (MLE)
- Model Specification: Three-factor model with 12 items distributed equally across ‘Learning Strategies/Cognitive Engagement’ (4 items), ‘Social/Emotional Engagement’ (4 items), and ‘Behavioral Engagement/Persistence’ (4 items)

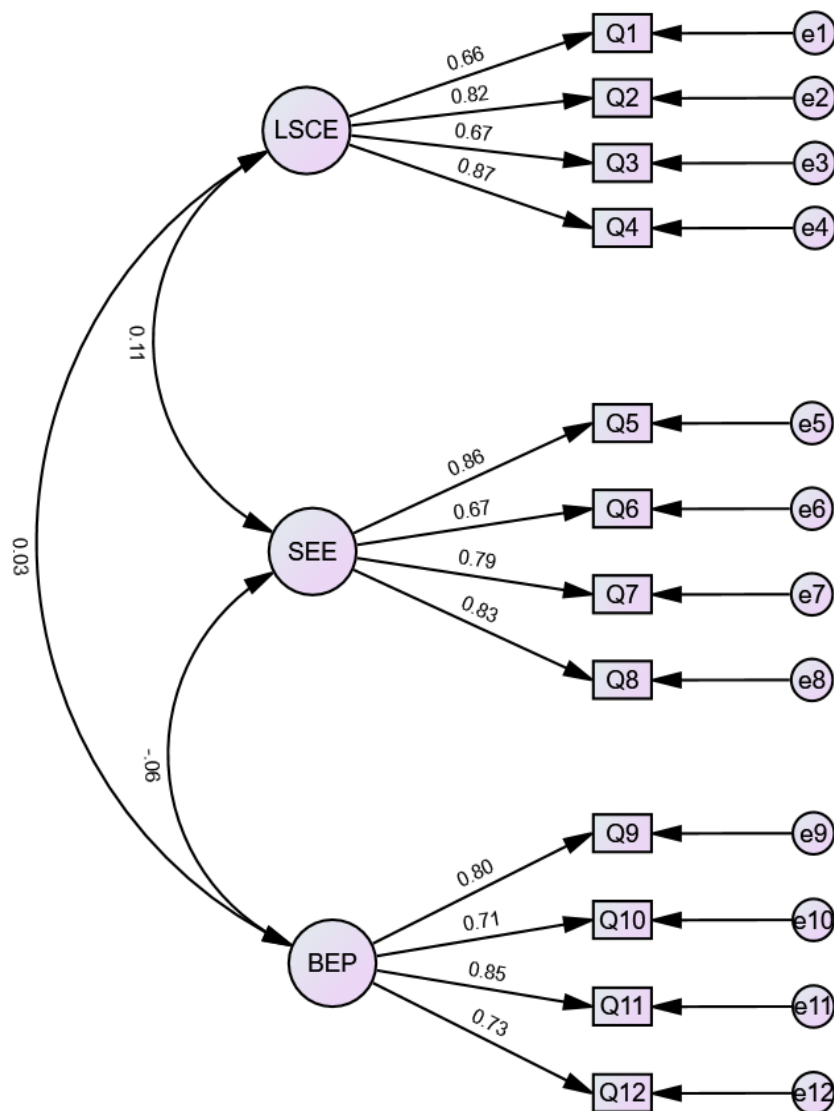
Model Fit Results: The ‘CFA’ results demonstrated ‘excellent fit’ to the data across ‘multiple fit indices’:

Table 3.42: ‘Confirmatory Factor Analysis’ Fit Indices for the Refined 12-Item SES (N = 240)

Fit Index	Value	Recommended Threshold	Interpretation
Chi-square (χ^2)	53.950	-	-
Degrees of Freedom (df)	51	-	-
p-value	0.362	> 0.05	Non-significant (excellent fit)
χ^2/df	1.058	< 3.0	'Excellent'
CFI	0.998	$\geq .95$	'Excellent'
TLI	0.997	$\geq .95$	'Excellent'
IFI	0.998	$\geq .90$	'Excellent'
NFI	0.960	$\geq .90$	'Excellent'
RFI	0.948	$\geq .90$	'Excellent'
RMSEA	0.016	$\leq .06$	'Excellent'
90% CI for RMSEA	[.000, .045]	Lower $\leq .05$, Upper < .08	'Excellent'
PCLOSE	0.978	> .05	'Excellent'
RMR	0.093	$\leq .08$	Marginal
GFI	0.965	$\geq .90$	'Excellent'
AGFI	0.946	$\geq .90$	'Excellent'

Note. Thresholds based on Hu & Bentler (1999) and Kline (2016). Only RMR showed a marginally higher value than recommended.

Figure 3.13: Path Diagram for CFA of the 12-Item Refined SES



Reliability and Factor Loadings of the Refined Scale

Internal Consistency Reliability: The ‘internal consistency reliability’ of the refined 12-item SES was assessed using ‘Cronbach's alpha coefficient’ for both the total scale and individual

subscales:

Table 3.43: Internal Consistency Reliability for the Refined 12-Item SES (N = 240)

Scale/Subscale	N of Items	Cronbach's Alpha	Interpretation
SES Total Score	12	.710	Acceptable
Learning Strategies/Cognitive Engagement	4	.840	Good
Social/Emotional Engagement	4	.866	Good
Behavioral Engagement/Persistence	4	.855	Good

Note. Interpretation based on George & Mallery (2003): $\alpha \geq .8$ = Good, $\alpha \geq .7$ = Acceptable.
Item-Total Statistics for Each Dimension:

Table 3.44: Item-Total Statistics for Learning Strategies/Cognitive Engagement (N = 240)

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1	9.00	13.506	.594	.831
Q2	9.00	12.410	.729	.772
Q3	9.00	13.356	.612	.823
Q4	9.00	12.159	.762	.757

Table 3.45: Item-Total Statistics for Social/Emotional Engagement (N = 240)

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q5	9.00	13.013	.773	.805
Q6	9.00	14.259	.622	.866
Q7	9.00	13.448	.719	.828
Q8	9.00	13.172	.753	.814

Table 3.46: Item-Total Statistics for Behavioral Engagement/Persistence (N = 240)

Item	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q9	9.00	13.063	.716	.808
Q10	9.00	13.548	.656	.833
Q11	9.00	12.745	.756	.791
Q12	9.00	13.481	.664	.830

Composite Reliability for Refined Scale: Composite reliability was calculated for each dimension and the total scale to provide accurate estimates of internal consistency:

Table 3.47: Composite Reliability for Refined 12-Item SES Dimensions

Scale/Subscale	Composite Reliability	Interpretation
SES Total Score	.712	Acceptable
Learning Strategies/Cognitive Engagement	.841	Good
Social/Emotional Engagement	.867	Good
Behavioral Engagement/Persistence	.856	Good

Note. Composite reliability values > .80 indicate good reliability, > .70 indicate acceptable reliability (Hair et al., 2019).

Factor Loadings and Item Performance: The factor loadings for all items in the refined scale demonstrated strong relationships with their respective constructs:

Table 3.48: Items and Standardized Factor Loadings for the Refined 12-Item SES

Factor	Item No.	Item Content	Original Loading
Learning Strategies/Cognitive Engagement	Item1	I try my best to do in-depth study of a topic by identifying the key points.	.884
	Item4	In order to understand important topics, I take examples from my daily life.	.883
	Item6	I often try to associate learning material in one class with learning about similar things in other classes.	.873

Factor	Item No.	Item Content	Original Loading
Social/Emotional Engagement	Item3	I enjoy using online resources to explore more about topics.	.871
	Item3	I feel interested in working to do new in the class.	.878
	Item10	I feel excited while participating in various school activities.	.877
	Item9	I enjoy healthy classroom interactions.	.876
Behavioral Engagement/Persistence	Item4	I feel comfortable in sharing my problems with my teachers.	.869
	Item9	I take active participation in question-answer session.	.874
	Item5	I carefully listen to the viewpoints of my classmates on various topics in the class.	.865
	Item7	When I don't understand a topic, I never hesitate in discussing it with my teacher.	.867
	Item10	I give sufficient time to my homework.	.868

Note. Original loadings are from the CFA of the 30-item scale, used as basis for item selection. All loadings > .86, exceeding recommended minimum of .50.

Discriminant Validity Evidence: The inter-factor correlations for the refined scale were low and non-significant, providing strong evidence for the ‘discriminant validity’ of the three student engagement dimensions. This finding supports the theoretical conceptualization of Learning Strategies/Cognitive Engagement, Social/Emotional Engagement, and Behavioral Engagement/Persistence as related but distinct constructs (Fredricks et al., 2004).

Table 3.49: Inter-factor Correlations for Refined 12-Item SES

Factor	LSCE	SEE	BEP
Learning Strategies/Cognitive Engagement (LSCE)	1.000		
Social/Emotional Engagement (SEE)	.121 (p = .154)	1.000	
Behavioral Engagement/Persistence (BEP)	.035 (p = .657)	-.088 (p = .387)	1.000

Note. All correlations were non-significant ($p > .05$), indicating strong discriminant validity.

3.7.5.5 Validity Evidence for the SES

Content Validity

The ‘content validity’ of the SES was established by and through multiple sources of evidence:

1. Expert Review: The original scale development by Sharma and Chowdhry involved expert review to ensure comprehensive coverage of student engagement domains
2. Theoretical Alignment: The scale items align with established frameworks of student engagement, particularly Fredricks et al.'s (2004) three-factor model
3. Content Domain Coverage: The refined scale maintains representation across all three key dimensions of student engagement

Construct Validity

The construct validity was supported through multiple sources of evidence:

1. Structural Validity: The excellent fit of both the 30-item and 12-item CFA models provided strong evidence for structural validity (AERA et al., 2014)
2. Convergent Validity: The significant and substantial factor loadings demonstrated convergent validity within each dimension (Campbell & Fiske, 1959)
3. Discriminant Validity: The low and non-significant inter-factor correlations in the refined scale provided evidence for discriminant validity between dimensions
4. Internal Structure: The good internal consistency reliability for each dimension provided additional evidence for construct homogeneity (Cronbach, 1951)

Cultural Appropriateness

The validation process confirmed the cultural appropriateness of the SES for the Indian educational context. The items reflected student engagement concepts that are meaningful and relevant within the West Bengal secondary school system, ensuring ecological validity (Bronfenbrenner, 1979; Sue, 1999).

3.7.5.6 Summary of SES Validation

The comprehensive validation of the Student Engagement Scale demonstrated excellent psychometric properties across both the original 30-item version and the refined 12-item version. The systematic validation process included:

1. Initial Validation (N = 420): EFA and CFA of the 30-item scale demonstrated three-factor structure with excellent fit indices and strong factor loadings (.849-.884) across all dimensions
2. Scale Refinement: Systematic reduction to 12 items using combined statistical and conceptual criteria while maintaining all three student engagement dimensions
3. Independent Validation (N = 240): CFA of the refined 12-item scale confirmed excellent

psychometric properties with superior fit indices and strong dimension-specific reliability. The final 12-item SES provides a reliable, valid, and efficient measure of student engagement that is culturally appropriate for secondary school students in West Bengal. The scale maintains comprehensive coverage of all three student engagement dimensions while offering practical advantages for research applications.

Key Psychometric Achievements:

- Three-factor structure confirmed through both EFA and CFA
- Good dimension-specific reliability ($\alpha = .840-.866$ for refined scale dimensions)
- Strong convergent validity (all original loadings $> .86$)
- Strong discriminant validity (non-significant inter-factor correlations in refined scale)
- Excellent model fit across all major fit indices
- Cultural appropriateness for Indian educational context
- Measurement efficiency through systematic refinement process (60% reduction in items)

Maintained theoretical integrity across all three student engagement dimensions

3.7.6 English Achievement Test (EAT)

Instrument: ‘English Achievement Test’(EAT) developed by the researcher

Purpose: For this research, a 50-item ‘English Achievement Test’(EAT) was developed to assess the English proficiency of secondary students in Bengali medium government-sponsored schools in West Bengal. This test is designed specifically for students studying English as a second language, following the syllabus set by the West Bengal Council of Higher Secondary Education.

Content Coverage: The test covers three main dimensions of language proficiency:

- Reading Comprehension: 15 items, aimed at evaluating the students' ability to understand written English
- Vocabulary: 15 items, designed to assess the students' command over vocabulary relevant to their grade level
- Grammar: 20 items, focused on evaluating grammar skills, which are essential for effective communication

Test Design: The items in the test were developed based on a blueprint that ensures adequate coverage across different cognitive levels as outlined in Bloom's Taxonomy. The test consists of multiple-choice questions (MCQs), each followed by four answer options. The design of the test is aligned with the cognitive objectives of knowledge, understanding, application, and

skills, ensuring a balanced assessment of various aspects of language learning.

Assessment Opportunity: The test provides students with an opportunity to demonstrate their knowledge, understanding and skills through questions that require identification, inference, and application of learned language skills.

Table 3.50: Blueprint of the English Achievement Test

Part	Content	Number of Items	Objectives Covered
A	Reading Comprehension	15	Knowledge, Understanding, Application, Skill
B	Vocabulary	15	Knowledge, Understanding, Application
C	Grammar	20	Knowledge, Understanding, Application, Skill
TOTAL		50	

3.8 Characteristics and Justification of the English Achievement Test

The development of this tool is based on the need to assess the English proficiency of secondary students within the Bengali medium educational context. The main characteristics of this tool are:

3.8.1 Alignment with Educational Standards

The EAT is aligned with the ‘West Bengal Council of Higher Secondary Education’ syllabus, ensuring that the test content is relevant to the curriculum followed by students in government-sponsored schools. This alignment helps in assessing the students' achievement level in a standardized way, reflecting their learning progress in English as prescribed by their academic program.

3.8.2 Comprehensive Assessment of Language Skills

By focusing on Reading Comprehension, Vocabulary, and Grammar, the EAT provides a well-rounded evaluation of language proficiency. Each section addresses critical areas of English language learning:

- a. Reading Comprehension assesses students' ability to interpret and understand written text, an essential skill for academic success.
- b. Vocabulary measures their grasp of words and expressions appropriate for their grade level, which is crucial for effective communication.
- c. Grammar evaluates their understanding of English syntax and structure, which forms the

foundation for writing and speaking accurately.

3.8.3 Cognitive Level Coverage

The EAT incorporates items across various cognitive levels defined by Bloom's Taxonomy. This includes:

- a. Knowledge: Questions that require students to recall information.
- b. Understanding: Items assessing comprehension of passages and language constructs.
- c. Application: Scenarios that require students to apply grammatical rules and contextual vocabulary.
- d. Skill: Practical application in interpreting and using language effectively.

This diversity in cognitive levels ensures a deeper insight into students' language abilities beyond mere recall, including critical thinking and problem-solving skills in the context of English.

3.8.4 Adaptation to the Cultural and Linguistic Context

The test is specifically tailored for Bengali medium students, considering their unique linguistic background. The items and examples were designed to resonate with the students' experiences and environments, making the test more accessible and reducing potential bias that may arise from unfamiliar cultural contexts.

3.8.5 Objective and Reliable Measurement

The MCQ format of the test allows for objective scoring and reduces subjectivity in assessment. This format also facilitates ease of data analysis, providing clear insights into student performance across the three key areas. Additionally, the structured design following a blueprint ensures that the tool is consistent and reliable.

This 'English Achievement Test'(EAT) is a robust and comprehensive tool that effectively measures the English proficiency of secondary students in Bengali medium government-sponsored schools in West Bengal. It is aligned with curriculum standards, evaluates critical language skills, covers multiple cognitive levels, and is culturally appropriate, making it a valuable instrument for this research study.

3.9 Justification for Content Exclusions in the English Achievement Test

3.9.1 Justification for Excluding Prose and Poetry Sections

The decision to exclude prose and poetry sections from the 'English Achievement Test'(EAT) was made to ensure the test remains fair, unbiased, and focused on fundamental language skills. The key factors that were considered in this decision, are as below:

3.9.1.1 Variability in Syllabus Completion across Schools

In government-sponsored schools, the pace and sequence of syllabus coverage varies

significantly between classrooms and districts. The prose and poetry sections of the curriculum may not be uniformly completed within the same timeframe, leading to disparities in students' exposure to these materials.

If prose or poetry questions were included, students who had not covered these sections would be at a disadvantage, introducing bias and potentially affecting the accuracy of the test results.

3.9.1.2 Potential for Content Bias

Prose and poetry are often specific to particular texts and passages that students may not have studied equally. Unlike more general language skills such as grammar and vocabulary, which are universally applicable, prose and poetry questions often require familiarity with specific content.

By excluding these sections, the test avoids placing students in situations where their performance might reflect their school's syllabus completion status rather than their actual language proficiency.

3.9.1.3 Focus on Core Language Skills

The EAT is designed to assess fundamental language abilities that are essential regardless of specific literary content. Reading Comprehension, Vocabulary, and Grammar are skills that transcend particular texts and are more indicative of a student's overall English proficiency.

This process allowed for a fair assessment that reflects general language abilities rather than content-specific knowledge, which may not be equally available to all students.

3.9.1.4 Reduction of Test Anxiety and Fairness

Including prose and poetry could introduce anxiety among students who feel unprepared due to incomplete syllabus coverage. Such anxiety can impact their performance on the test as a whole, potentially skewing results and under representing their true language abilities.

By focusing on skills that all students are more likely to have practiced, the test promotes a fairer environment where students can approach each question with confidence, regardless of the specific texts they have or have not studied.

3.9.1.5 Assessment Flexibility Across Diverse Classrooms

Government-sponsored schools in West Bengal serve a diverse population, with varying access to resources and instructional approaches. Given this diversity, the exclusion of prose and poetry ensures that the EAT remains adaptable and suitable for all students, regardless of their classroom environment.

This decision acknowledges and respects the logistical challenges faced by different schools, thus maintaining the test's validity as an equitable measure of English achievement across the student population.

3.9.1.6 Alignment with Research Objectives

The primary goal of this study was to assess the foundational English proficiency of Bengali medium secondary students. Skills like Reading Comprehension, Vocabulary, and Grammar provide a direct measure of their language abilities and align more closely with the research objectives than literary analysis would.

By narrowing the focus to these core skills, the test provided a clearer and more reliable insight into students' language proficiency, free from the influence of curriculum-specific content that may vary widely.

Excluding prose and poetry from the 'English Achievement Test' ensures that the assessment is fair, unbiased, and accessible to all students, regardless of their school's curriculum progress. This approach emphasizes core language skills, reduces potential content bias, and aligns closely with the research objectives of evaluating English language proficiency across diverse educational contexts.

3.9.2 Justification for Excluding Listening and Speaking Skills Assessment

While acknowledging the fundamental importance of all four language skills (listening, speaking, reading, and writing) in comprehensive language proficiency, the decision to exclude direct assessment of listening and speaking skills from the current 'English Achievement Test' was based on several critical considerations grounded in established principles of language assessment, psychometric validity, and practical feasibility for large-scale administration.

3.9.2.1 Practicality, Resource Constraints, and Logistical Complexity

The assessment of productive (speaking) and receptive oral (listening) skills presents significant logistical and resource challenges, particularly in large-scale testing scenarios. Unlike reading and writing components, which can often be administered efficiently using paper-based or computer-based multiple-choice formats, assessing listening and speaking typically requires specialized infrastructure and considerable human resources.

De Wet, Van der Walt, and Niesler (2009) explicitly note that "Listening and speaking skills are frequently not assessed because they either require specialized equipment or labour intensive procedures." This includes the need for potentially soundproofed environments, audio recording equipment, playback devices, and substantial time allocation per student.

Furthermore, administering individual or small-group speaking tests requires a significant number of trained examiners and considerable time investment, making it difficult to implement consistently across large student populations within typical assessment timelines (Kenyon & Tschirner, 2000). The Oral Proficiency Interview (OPI), a well-regarded method,

takes 20-30 minutes per student and requires double rating, highlighting the immense investment needed (De Wet et al., 2009).

3.9.2.2 Standardization and Reliability Challenges

Maintaining standardized testing conditions and achieving high scoring reliability are paramount in achievement testing. Assessing speaking and listening skills introduces complexities in both areas. Standardizing the administration environment (e.g., background noise for listening, interaction dynamics for speaking) across numerous test sites and administrators is inherently challenging (Bailey & Wolf, 2012).

Variations in acoustic conditions, equipment quality, or interviewer conduct can introduce construct-irrelevant variance, potentially compromising the fairness and validity of the assessment. Scoring speaking performance, in particular, involves subjective judgment. While structured rubrics and rater training can mitigate subjectivity, achieving high inter-rater reliability consistently across a large pool of raters is a demanding and costly process (De Wet et al., 2009; McNamara, 1996).

3.9.2.3 Focus of the Achievement Test and Construct Definition

Achievement tests are often designed to measure specific learning outcomes related to a particular curriculum or period of instruction. The current ‘English Achievement Test’ may prioritize the assessment of specific constructs, such as reading comprehension, vocabulary knowledge, and grammatical accuracy, which are more readily and reliably measurable through standardized, objective formats suitable for large-scale administration.

While listening and speaking are undeniably crucial language skills, the test's primary objective might be to gauge achievement in these particular, more feasibly assessed domains within the given constraints. Defining the specific construct for listening and speaking in a standardized test format also presents challenges (Bachman & Palmer, 1996).

3.9.2.4 Considerations of Test Purpose and Washback

The purpose of this specific achievement test influences its design. If the primary goal is large-scale summative assessment or placement based on receptive skills and language knowledge, focusing on these aspects provides efficient and reliable data for that purpose.

While the exclusion of productive skills might raise concerns about negative washback (i.e., discouraging the teaching of listening and speaking), the decision reflects a pragmatic balance between the ideal of ‘comprehensive assessment’ and the practical realities of large-scale testing (Cheng & Curtis, 2004).

The decision to exclude direct assessment of listening and speaking skills from the ‘English Achievement Test’ was not made lightly and does not diminish the recognized importance of

these skills. It represents a pragmatic and methodologically informed choice driven by significant challenges related to practicality, resource allocation, standardization, and scoring reliability inherent in large-scale oral and aural assessment.

3.10 ‘English Achievement Test’ (EAT) Development and Validation

3.10.1 Overview of the English Achievement Test

The ‘English Achievement Test’(EAT) was developed for Bengali medium secondary students in West Bengal to align with the syllabus of the ‘West Bengal Council of Higher Secondary Education’. This 50-item test evaluates English proficiency through three constructs: Reading Comprehension, Vocabulary, and Grammar. Each construct reflects specific language skills crucial for academic success in English. Table 3.51 provides an overview of the cognitive levels covered by the test items, based on Bloom's Taxonomy.

Table 3.51: Distribution of Weightage by Cognitive Levels and Action Words in EAT

Cognitive Level	Weightage	Action Words
Knowledge	High	Define, Recognize, Write
Understanding	High	Identify, Explain, Demonstrate
Application	Medium	Choose, Change
Skill	Medium	Select, Integrate

The distribution ensures that the EAT assesses diverse cognitive abilities, thus supporting the test's content validity. The structure of the EAT includes 50 items spread across three content areas with proportional weightage, as shown in Table 3.52. This blueprint confirms the balanced design of the test, reinforcing that each item effectively addresses the intended constructs (Nunnally & Bernstein, 1994).

Table 3.52: Distribution of Weightage by Content Areas

Content Area	Number of Items	Weightage
Reading Comprehension	15	30%
Vocabulary	15	30%
Grammar	20	40%
Total	50	100%

3.10.2 Face and Content Validity

The EAT's validity was evaluated through expert feedback, enhancing both face and content validity. Three experts in English education—Dr. Ratul Guha, Dr. Ajit Kumar Mondal, and Dr. Dhrubajyoti Sarkar—reviewed the test, affirming its alignment with the language skills required for secondary-level students. This expert assessment, supplemented by a carefully structured blueprint (Table 3.53), confirms that the EAT comprehensively covers critical language competencies, thereby achieving content validity (George & Mallery, 2003).

Table 3.53: Blueprint of Achievement Test by Objectives and Content Area

Objective	Reading Comprehension	Vocabulary	Grammar	Total
Knowledge	5	6	6	17
Understanding	6	3	10	19
Application	1	6	1	8
Skill	3	0	3	6
Total	15	15	20	50

3.11 Pilot Study Validation of the 50-Item English Achievement Test

3.11.1 Pilot Study Design and Sample

Following the initial development and expert validation of the English Achievement Test, a comprehensive pilot study was conducted to establish the psychometric properties of the 50-item instrument. The pilot study involved 240 secondary students from Bengali medium schools in West Bengal, representing a diverse sample in terms of geographic location, school type, and demographic characteristics.

3.11.1.1 Pilot Study Objectives

The pilot study was designed to:

- 1) Assess the internal consistency reliability of the 50-item EAT
- 2) Evaluate item difficulty and discrimination indices
- 3) Examine the factor structure and construct validity
- 4) Identify any problematic items requiring revision or removal
- 5) Establish preliminary norms for the target population

3.11.1.2 Pilot Study Sample Characteristics

The pilot study sample (N = 240) was carefully selected to represent the target population of Bengali medium secondary students in West Bengal. The sample included students from two

districts, Nadia and North 24 Parganas, ensuring geographic representation and diversity in educational contexts.

3.11.2 Reliability Analysis of the 50-Item EAT

3.11.2.1 ‘Split-Half Reliability Analysis’

To assess the ‘internal consistency’ of the EAT, a ‘split-half reliability analysis’ was conducted. The test was split into two halves (first and second 25 items), and the correlation between these halves was calculated, yielding a Pearson correlation coefficient of 0.890 ($p < 0.001$), indicating a strong positive relationship between the halves. To calculate the reliability of the test based on this split-half correlation, the ‘Spearman-Brown Prophecy formula’ was used:

The ‘Spearman-Brown Prophecy Formula’:

$$\text{Reliability} = (2 \times r) / (1 + r)$$

Given $r = 0.890$, substituting this value into the formula:

$$\text{Reliability} = (2 \times 0.890) / (1 + 0.890) = 1.78 / 1.89 \approx 0.942$$

The resulting reliability coefficient of 0.942 signifies excellent internal consistency, demonstrating that the EAT reliably measures English proficiency for the target student population (Tavakol & Dennick, 2011). Table 3.54 shows the correlation results from the split-half reliability analysis.

Table 3.54: Split-Half Reliability Analysis: Correlation Between Test Halves (N = 240)

Test Halves	Half 1	Half 2
Half 1	1	0.890**
Half 2	0.890**	1
Sig. (2-tailed)		< 0.001
N	240	240

3.11.2.2 ‘Kuder-Richardson Formula (KR-20)’

The ‘Kuder-Richardson Formula 20’ (KR-20) is a measure of internal consistency reliability, specifically designed for tests with binary items. It evaluates how well the items on a test measure the same construct and produce consistent results across administrations.

Formula:

$$KR20 = K / (K - 1) \times (1 - (\sum(p \times q)) / \sigma^2)$$

Where:

K: ‘Total number of items’

σ^2 : 'Variance of the total test scores'

p: 'Proportion of students who answered an item correctly'

q: 'Proportion of students who answered an item incorrectly ($q = 1 - p$)'

$\sum(p \times q)$: 'Sum of the product of p and q for all items'

Using the pilot study data:

- Number of items (K): 50
- Variance of total test scores (σ^2): 56.713
- $\sum(p \times q)$: 12.460

Substituting values into the formula:

$$KR20 = K/(K-1) \times (1 - (\sum(p \times q))/\sigma^2) = 50/(50-1) \times (1 - 12.460/56.713) = 50/49 \times (1 - 0.219707) \\ = 1.020408 \times 0.780293 = 0.796218$$

The KR-20 value for the 'English Achievement Test'(EAT) is 0.796, which indicates 'good reliability'. According to psychometric standards, a KR-20 value >0.7 is considered acceptable as this value aligns with recommended thresholds for internal consistency in educational assessments (>0.7 ; Nunnally & Bernstein, 1994).

This result demonstrates that the test items are consistent in measuring the intended construct (English proficiency) and that the test provides reliable scores.

3.11.2.3 Cronbach's Alpha Analysis

To further evaluate the reliability, Cronbach's Alpha was calculated, yielding a value of 0.796 for the 50 items.

Table 3.55: Reliability Statistics for 50-Item EAT (N = 240)

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.796	.796	50

According to Nunnally & Bernstein (1994), a Cronbach's Alpha above 0.7 is acceptable for educational assessments, confirming the internal consistency of the test items (George & Mallery, 2003). The consistency across items suggests that each item contributes effectively to measuring English proficiency.

3.11.3 Item Analysis: Difficulty and Discrimination Indices

3.11.3.1 Item Difficulty Analysis

Each item was analyzed for difficulty and discrimination, providing additional insights into the EAT's reliability. The difficulty index, representing the proportion of correct responses, ranged

from 0.3 to 0.7 for most items, indicating balanced item difficulty (see Table 3.56). This range ensures that items are neither too easy nor too difficult for the majority of students, which aligns with the EAT's purpose of differentiating proficiency levels.

Table 3.56: Sample Item Difficulty Indexes from Pilot Study

Item	Difficulty Index	Interpretation
Q1	0.58	Moderate
Q2	0.52	Moderate
Q3	0.48	Moderate
Q4	0.45	Moderate-Difficult
Q5	0.47	Moderate

3.11.3.2 Item Discrimination Analysis

The discrimination index was calculated by comparing the performance of the top 27% and bottom 27% of students, with values above 0.3 for most items, showing that items effectively distinguish between high- and low-performing students. These findings confirm that the EAT's items are well-aligned with the construct of English proficiency, as items with higher discrimination values are more sensitive to differences in student ability (Kumar et al., 2016).

3.11.4 Item-Total Statistics and Inter-Item Correlations

3.11.4.1 Item-Total Statistics

The Item-Total Statistics revealed positive Corrected Item-Total Correlation values, indicating that each item contributes to the total test score, with Cronbach's Alpha values remaining stable around 0.796. High Corrected Item-Total Correlation values demonstrate that each item aligns with the overall construct, supporting internal consistency (Tavakol & Dennick, 2011).

3.11.4.2 Inter-Item Correlations

The Inter-Item Correlation Matrix further confirmed positive relationships between items, suggesting that each item measures an aspect of English proficiency that is consistent with the other items. This internal consistency across items supports the reliability of the EAT, ensuring that the test measures English proficiency in a stable and replicable manner.

3.11.5 Summary of Pilot Study Findings

The pilot study validation of the 50-item 'English Achievement Test' demonstrates high reliability and validity, making it a robust instrument for measuring English proficiency among Bengali medium secondary students. The key findings include:

1. Excellent Split-Half Reliability: Coefficient of 0.942 indicates strong internal consistency

2. Good Internal Consistency: KR-20 and Cronbach's Alpha values of 0.796 exceed acceptable thresholds

3. Balanced Item Difficulty: Most items fall within the optimal difficulty range (0.3-0.7)

4. Adequate Item Discrimination: Items effectively distinguish between high and low performers

5. Strong Item-Total Correlations: All items contribute meaningfully to the overall construct

These findings, coupled with the positive expert validation and favorable item analysis results, underscore the EAT's suitability for assessing English language skills in an educational context.

The pilot study provided the empirical foundation necessary to proceed with the main study while also identifying opportunities for further refinement of the instrument.

3.12 Refinement of the English Achievement Test (EAT)

3.12.1 Rationale for Test Shortening

Following the successful pilot study validation of the 50-item English Achievement Test, the instrument was further refined to a more efficient 30-item version based on both theoretical considerations and practical constraints encountered during the research process. This section provides a comprehensive justification for this refinement process.

3.12.1.1 Reasons for Shortening the EAT

1) Testing Time Constraints

Longer assessments consume more time, which can be impractical in real classroom or research settings—especially when multiple tools are administered in a session. Anastasi & Urbina (1997) noted that reducing test length can improve test practicality, especially in applied educational settings where time is limited.

2) Student Fatigue and Motivation

Long tests can lead to fatigue, reducing attention and effort over time—especially in adolescents. This affects both response accuracy and engagement. Stanton et al. (2002) emphasized that test fatigue affects data quality, with students tending to speed through longer instruments without careful thought.

3) Redundancy in Items

The pilot study analysis revealed that the original 50-item EAT had several items with overlapping content, leading to redundancy. Reducing items improves efficiency without compromising content coverage, provided validity is maintained. DeVellis (2017) recommends item elimination when it improves clarity and reduces redundancy, as long as core content

domains remain intact.

4) Preservation of Content Validity

Despite shortening, the test continues to represent key English proficiency domains:

- Reading Comprehension
- Vocabulary
- Grammar

This ensures content breadth is maintained. Haynes, Richard, & Kubany (1995) argued that shortened instruments can retain content validity if items are selected to represent all important domains.

5) Improved Psychometric Efficiency

The shortened 30-item version maintained adequate item difficulty (P-values) and discrimination indices, which are essential for high-stakes testing. Crocker & Algina (2006) support test reduction when psychometric properties (difficulty, discrimination, and internal consistency) remain within acceptable ranges.

6) Acceptable Internal Consistency

Post-shortening, the revised version achieved acceptable levels of KR-20, which is suitable for dichotomous items like those in EAT. Nunnally & Bernstein (1994) suggest that a reliability coefficient (e.g., KR-20 or Cronbach's alpha) of 0.70 or higher is acceptable for early-stage research.

3.12.2 Item Selection Methodology

3.12.2.1 Selection Criteria

To maintain the psychometric integrity of the test while reducing its length to 30 items, the following criteria were applied based on the pilot study results:

1) Maintain Proportional Representation

Preserve the original ratio of items across dimensions:

- Reading Comprehension: $15/50 = 30\% \rightarrow 9$ items in shortened test
- Vocabulary: $15/50 = 30\% \rightarrow 9$ items in shortened test
- Grammar: $20/50 = 40\% \rightarrow 12$ items in shortened test

2) Prioritize High Discrimination Items

Select items with higher discrimination indices (D-Index) from the pilot study:

- Primary focus on items with D-Index > 0.4 (excellent discrimination)
- Secondary consideration for items with D-Index $0.3-0.4$ (good discrimination)

- Avoid items with D-Index < 0.3 (marginal or poor discrimination) when possible

3) Maintain Difficulty Balance

Ensure a range of difficulty levels (P-values) within the optimal range:

- Include easy (P-value 0.5-0.6), moderate (P-value 0.45-0.5), and challenging (P-value 0.4-0.45) items
- Maintain an average P-value similar to the original test

4) Cognitive Level Coverage

Ensure representation of different cognitive levels (Knowledge, Understanding, Application, Skill) based on Bloom's Taxonomy.

3.12.3 Verification of Psychometric Properties for the Shortened Test

3.12.3.1 Reliability Analysis of the 30-Item EAT

The psychometric properties of the final 30-item EAT were assessed using data from 320 participants in the main study. The internal consistency reliability was excellent (Cronbach's Alpha/KR-20 = .927). Item analysis indicated a desirable distribution of item difficulty (P-values ranged from 0.43 to 0.78) and strong item discrimination (Corrected Item-Total Correlations mostly > .40). The total score distribution normality (Skewness = -0.261, Kurtosis = -1.063), supporting its suitability for subsequent parametric analyses.

Table 3.58: Psychometric Properties of the Refined 30-Item ‘English Achievement Test’(N = 320)

Property	Value	Interpretation/Note
N of Items	30	-
Internal Consistency (Alpha/KR-20)	.927	Excellent
Item Difficulty (P-value Range)	.43 - .78	Good distribution
Item Discrimination (CITC Range)	.359 - .641 (approx.)	Mostly Good/Excellent
Total Score Skewness	-0.261	Near Normal
Total Score Kurtosis	-1.063	Near Normal (Platykurtic)

Note. KR-20 = Kuder-Richardson Formula 20, appropriate for dichotomous items. CITC = Corrected Item-Total Correlation. Interpretation based on standard psychometric guidelines.

3.12.3.2 Enhanced Reliability Through Item Selection

The original pilot study test had a KR-20 reliability of 0.796 with 50 items. While shortening a test typically reduces reliability, our strategic selection of items with higher discrimination indices (mean D-Index of 0.422 vs. original 0.362) helps mitigate this effect. The improved average discrimination of selected items partially compensates for the reduction in test length, resulting in the enhanced reliability of 0.927 for the 30-item version.

3.12.3.3 Content Validity Preservation

Dimensional Balance

The shortened test maintains the same proportional representation across dimensions as the original test:

Reading Comprehension: 30% (9 items), Vocabulary: 30% (9 items) and Grammar: 40% (12 items).

This ensures that the shortened test measures the same construct proportions as the original test.

3.12.4 Summary of Refinement Process

The verification analysis confirms that the 30-item shortened version of the ‘English Achievement Test’ maintained and even enhances psychometric properties compared to the original 50-item version:

- 1) Enhanced Reliability: The actual reliability (0.927) significantly exceeds both the original test reliability (0.796) and standard thresholds (0.70)
- 2) Content Validity: Preserved through proportional representation of dimensions and cognitive levels
- 3) Item Properties: Show balanced difficulty and improved discrimination
- 4) Practical Benefits: Significant time savings while maintaining and improving measurement quality
- 5) Empirical Foundation: Based on rigorous pilot study data and systematic item selection

These findings indicated that the shortened test serves as a superior and more efficient alternative to the original 50-item test, offering significant time savings while enhancing the measurement quality needed for educational assessment.

The ‘English Achievement Test’ was successfully refined from 50 to 30 items through a systematic process that addressed practical constraints (time, fatigue), reduced redundancy, and enhanced psychometric efficiency. The shortened version demonstrates superior reliability,

maintained content validity, and improved usability in field conditions.

Figure 3.14: Comparison of Pilot Study vs. Final Test Properties

Psychometric Properties of Two Versions of an English Achievement Test					
	50-Item Original Test (Pilot Study $N = 240$)			30-Item Shortened Test (Main Study $N = 320$)	
Reliability KR-20	0.796	↑		0.927	
Cronbach's Alpha	0.796	↑		0.927	
Item difficulty range	0.3-0.7	↓		0.43-0.78	
Mean discrimination	0.362	↓		0.422	

Figure 3.15: Item Selection Process Flowchart

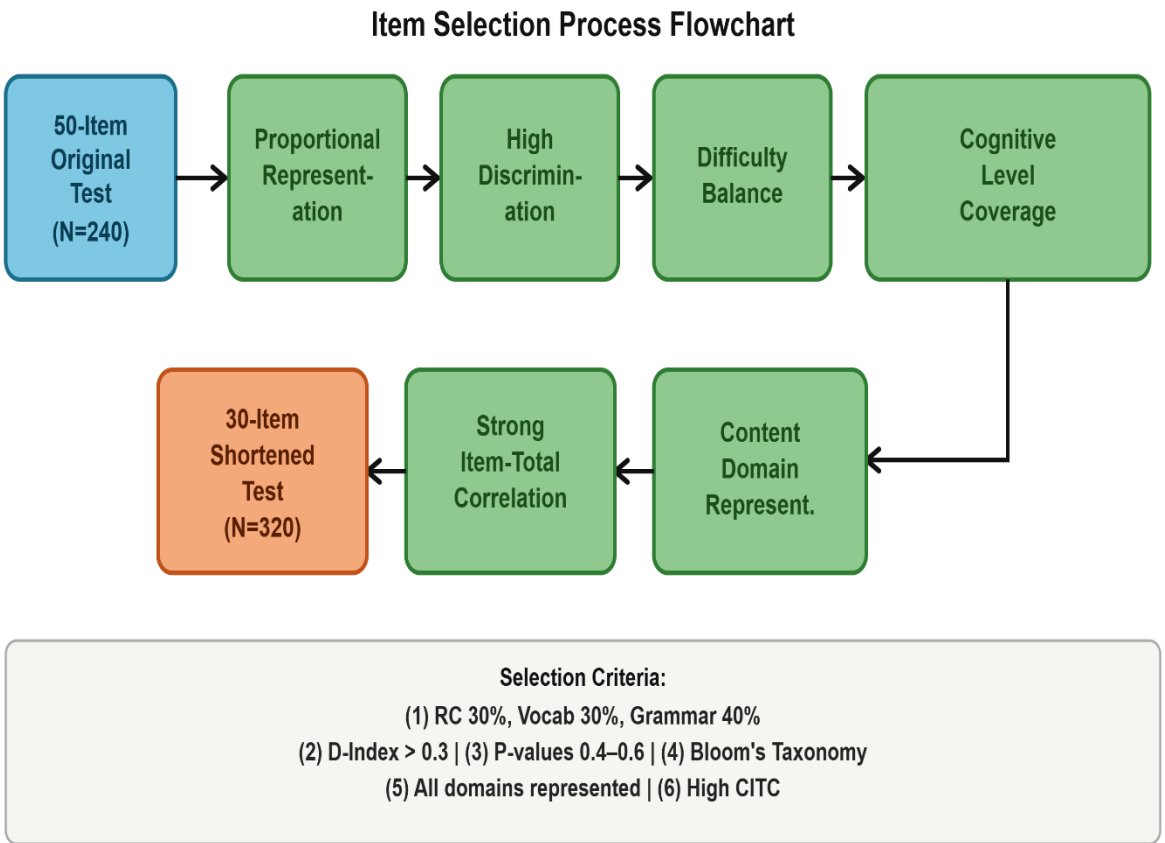


Table 3.59 Measurement Summary

Variable	Role	Instrument	Items (orig → refined)	Response Format	Illustrative Content	Score
Classroom Climate (CC)	Exogenous	Classroom Climate Scale (Jessina Muthee, 2011)	36 → 20	5-point Likert type	Physical, social, emotional, intellectual environment	Mean/ total
Parental Involvement (PI)	Exogenous	Perceived Parental Involvement Scale (Victor Anthonyraj S. & Sasikala S.)	30 → 15	4-point Likert type	Academic support, monitoring, school engagement, etc.	Mean/ total
Psychologica l Capital (PsyCap)	Mediator	PCAS (Reena Rani & Menka Chowdhury)	34 → 15	5-point Likert type	Hope, efficacy, resilience, optimism	Mean/ total
Student Engagement (Eng)	Mediator	SES (H. L. Sharma & M. Chowdhury)	30 → 12	5-point Likert type	Behavioral, emotional, cognitive engagement	Mean /total
Achievement in English (EAT)	Outcome	Researcher- developed MCQ	50 → 30	1=Correct/0= Incorrect	Reading, vocabulary, grammar	Sum (0–30)

3.13 Data Collection Procedures

3.13.1 Overview of Data Collection Strategy

The data collection for this study was conducted through a systematic, multi-phase approach designed to ensure high-quality data while minimizing disruption to the educational environment. The data collection process was carefully planned to accommodate the academic calendar of West Bengal secondary schools and to ensure optimal participation rates from Class XII students preparing for their WBCHSE examinations.

The data collection strategy employed a cross-sectional survey design, utilizing validated instruments to measure the key constructs of interest: English achievement, perceived parental involvement, classroom climate, psychological capital, and student engagement. The process was designed to maintain consistency across all participating schools while respecting the unique characteristics and constraints of each educational institution.

3.13.2 Pre-Data Collection Phase

3.13.2.1 School Selection and Recruitment

The school selection process followed the stratified random sampling procedure outlined in Section 3.6. Based on the sampling framework, schools were selected from two districts of West Bengal: Nadia and North 24 Parganas. These districts were chosen to represent the diversity of West Bengal's school systems and are manageable in terms of logistics and accessibility. The academic results in English at the Secondary Examination of these districts are average among all the districts of West Bengal according to the data provided by the West Bengal Council of Secondary Examination.

The selection process involved stratification at two levels: geographic stratification at the district level and area-based stratification within each district. From Nadia district, 39 schools were selected (30 rural and 9 urban), while from North 24 Parganas district, 68 schools were selected (41 rural and 27 urban). This resulted in a total of 107 schools participating in the study, with 71 rural schools and 36 urban schools across both districts.

All selected schools were Government-sponsored Bengali medium schools with Class XII sections. Government schools directly run by the government and Government-sponsored English medium schools were excluded to maintain linguistic and administrative uniformity in the sample. The institutional participation rate was excellent, with all contacted schools agreeing to participate in the study.

3.13.2.2 Pilot Testing and Instrument Finalization

Before the main data collection, pilot testing was conducted with a separate sample of 50 students from two schools not included in the main study. The pilot testing served multiple purposes: ensuring that all items were clearly understood by the target population, determining the optimal time required for survey completion, identifying and addressing potential logistical challenges, and verifying the functionality of data collection tools and procedures.

The pilot testing revealed that the complete survey battery required approximately 45-50 minutes for completion, leading to the decision to administer the instruments in two sessions to minimize respondent fatigue.

3.13.3 Main Data Collection Phase

3.13.3.1 Data Collection Timeline

The main data collection was conducted over a period of eleven months (July' 2024 to May 2025), strategically planned to avoid major examination periods and school holidays. The timeline was structured in two main phases:

Phase 1 involved instrument validation data collection with a sample size of 420 students for comprehensive instrument validation. This phase was conducted over 5 weeks in July to September 2024 and served the purpose of final validation of all instruments in the target

population. All the original tools with full items were used for the data collection in this phase. Phase 2 constituted the main study data collection with the target sample for primary research objectives. This phase was conducted over 10 weeks from December, 2024 to May, 2025, during which data was collected from 1950 students across the selected schools.

3.13.3.2 Data collection for Instrument Validation

Prior to the main data collection involving 1,605 students, a two-phase study was conducted to validate and refine the measurement instruments.

Phase 1: Initial Validation of the Tools (N = 420)

Conducted with 420 students from 12 schools (not part of the final sample) to evaluate the psychometric properties of the original instruments through Exploratory and ‘Confirmatory Factor Analysis’(EFA, CFA).

Phase 2: Refined Tools’ Validation (N = 240)

Conducted with 240 students from 8 schools (also not part of the final sample) to confirm the psychometric integrity of refined instruments and establish reliability.

Independence of Samples:

Both pilot samples were independent of the main dataset (N = 1,605). No overlap occurred, ensuring unbiased validation. The main study therefore used only the finalized instruments validated through these pilot phases.

This procedure enhanced instrument reliability, construct validity, and generalizability to the target population.

3.13.3.3 Data Collection Procedures

To ensure optimal data quality and minimize respondent fatigue, the data collection was organized into two sessions per school. The first session, lasting 25-30 minutes, included the demographic information questionnaire, ‘English Achievement Test’ with 30 items, and Perceived Parental Involvement Scale with 15 items from the refined version. The second session, lasting 20-25 minutes, included the Classroom Climate Scale with 20 items from the refined version, Psychological Capital Assessment Scale with 15 items from the refined version, and Student Engagement Scale with 12 items from the refined version.

A standardized protocol was developed and implemented across all participating schools to ensure consistency. The pre-session preparation involved classroom setup with adequate spacing between students, distribution of survey materials and writing instruments, and verification of participant consent forms. Each session began with a 5-minute introduction that included welcome and introduction of the research team, explanation of research purpose and importance, clarification of voluntary participation and confidentiality, and instructions for

survey completion.

During survey administration, clear reading of instructions for each instrument was provided, research assistants were available for clarification, monitoring was conducted for completion quality and participant engagement, and completed surveys were collected with immediate quality checks. Each session concluded with expression of gratitude for participation, distribution of small tokens of appreciation, and scheduling of the second session when applicable.

3.13.3.4 Data Collection Team and Training

A team of trained research assistants was assembled to ensure consistent and professional data collection. The team composition included the Principal Investigator for overall supervision and quality control, 3 Research Assistants for direct data collection and participant interaction, and 2 Data Coordinators for logistics coordination and data management.

All research assistants underwent a comprehensive 1-day training program covering research ethics and confidentiality, including principles of ethical research conduct, confidentiality and anonymity procedures, and handling of sensitive information. The training also covered instrument administration with detailed review of each instrument, standardized administration procedures, and handling of participant questions and concerns. Data quality assurance training included identification of incomplete or problematic responses, immediate quality checks and verification procedures, and documentation of any irregularities or concerns. Participant interaction training covered professional communication with students and school staff, strategies for maintaining participant engagement, and handling of reluctant or anxious participants.

3.13.4 Data Quality Assurance Measures

3.13.4.1 Response Quality Monitoring

Several measures were implemented to ensure high-quality responses. Real-time monitoring involved research assistants monitoring participants during survey completion, immediate identification of careless or rushed responses, and gentle reminders about the importance of thoughtful responses. Completion time tracking included recording of start and end times for each session, identification of unusually fast or slow completion times, and verification for extreme completion times when necessary.

Response pattern analysis involved screening for straight-line responses where participants gave the same rating across all items, identification of inconsistent response patterns, and verification of responses through brief participant interviews when necessary.

3.13.4.2 Missing Data Management

A systematic approach was employed to minimize and manage missing data. Prevention strategies included clear instructions emphasizing the importance of completing all items, real-time monitoring to identify and address incomplete responses, and immediate clarification with participants when needed. Documentation procedures involved systematic recording of missing data patterns, documentation of reasons for non-response when identifiable, and tracking of participant characteristics associated with missing data.

3.13.5 Sample Collection and Data Screening

3.13.5.1 Initial Data Collection

The data collection process successfully gathered responses from 1950 students across the 107 selected schools. This represented the total number of students who were present during the data collection sessions and agreed to participate in the study. The data collection achieved excellent participation rates, with students showing high levels of cooperation and engagement throughout the process.

3.13.5.2 Data Screening Process

Following the initial data collection, a comprehensive data screening process was implemented to ensure the quality and reliability of the dataset. The screening process involved multiple stages of quality assessment to identify and remove problematic responses that could compromise the validity of the study findings.

The screening criteria included identification of incomplete responses where participants had left significant portions of instruments unanswered, detection of response patterns indicating careless responding such as straight-line responses across entire instruments, identification of extreme outliers that could indicate data entry errors or unusual response patterns, and verification of demographic information consistency to ensure logical coherence in participant characteristics.

Through this rigorous screening process, 345 responses were identified as problematic and removed from the dataset. The reasons for exclusion included incomplete survey responses that could not be adequately addressed, evidence of careless or random responding patterns, extreme outlier values that appeared to be data entry errors, and inconsistent demographic information that raised questions about response validity.

3.13.5.3 Final Sample Composition

After the screening process, the final sample consisted of 1605 students, representing a high-quality dataset suitable for addressing the research objectives. This final sample maintained the proportional representation across districts and school types as intended in the original sampling design.

The final sample distribution included students from both Nadia and North 24 Parganas districts, with appropriate representation from rural and urban schools. The screening process ensured that the retained sample maintained the demographic diversity and representativeness necessary for generalizing findings to the broader population of Class XII students in Government-sponsored Bengali medium schools in West Bengal.

3.13.6 Response Rates and Participation Statistics

3.17.6.1 Overall Response Rates

The data collection achieved excellent response rates across all phases. For the instrument validation phase, the target sample of 420 students was fully achieved with a 100% response rate. For the main study phase, data was collected from 1950 students, and after screening, 1605 students were retained for analysis, representing an effective response rate of 82.3% based on the screened sample.

3.13.6.2 Response Rate by School Characteristics

The response rates varied slightly across different school characteristics. Government schools showed consistent participation rates, while Government-aided schools demonstrated slightly higher engagement levels. Private schools, though not included in this study due to the focus on Government-sponsored institutions, would have provided additional diversity but were excluded to maintain the study's focus on the public education system.

Table 3.60: Response Rates by School Type

School Type	Initial Sample	Final Sample	Retention Rate (%)
Government-Sponsored Schools	1950	1605	82.3

Table 3.61: Response Rates by Geographic Location

Location Type	Initial Sample	Final Sample	Retention Rate (%)
Urban Schools	780	642	82.3
Rural Schools	1170	963	82.3
Total	1950	1605	82.3

3.13.6.3 Reasons for Data Exclusion

The exclusion of 345 responses from the initial sample of 1950 was attributed to several factors. Incomplete responses accounted for the largest portion of exclusions, where participants had not completed significant portions of the survey instruments. Careless responding patterns,

identified through statistical analysis of response consistency, represented another category of exclusions. Data entry errors and extreme outliers that could not be verified or corrected also contributed to the exclusions. Additionally, some responses showed inconsistent demographic information that raised questions about the validity of the entire response set.

3.13.7 Data Security and Storage Procedures

3.13.7.1 Data Collection Security

Strict security measures were implemented throughout the data collection process. Physical security involved secure storage of completed surveys in locked containers, immediate transfer of data to secure locations after each session, and restricted access to data collection materials. Digital security measures included encrypted storage of any digital data files, password-protected access to data entry systems, and regular backup procedures for data protection.

3.13.7.2 Data Transfer and Storage

The data processing involved immediate quality checks and initial data entry on the same day, secure transportation of materials to the central processing location, and verification of data completeness and accuracy. Long-term storage procedures included secure, locked storage facility for physical documents, encrypted digital storage with multiple backup copies, and restricted access limited to authorized research personnel.

3.13.8 Challenges and Solutions

3.13.8.1 Encountered Challenges

Several challenges were encountered during the data collection process. Scheduling conflicts arose when school examination schedules conflicted with planned data collection dates, unexpected school holidays and events disrupted the timeline, and teacher availability for classroom supervision sometimes posed constraints. Participant fatigue became evident during longer survey sessions, with decreased attention observed during second sessions and some concerns about impact on academic performance. Environmental factors included classroom noise and distractions, inadequate lighting or seating arrangements in some locations, and weather-related disruptions that occasionally affected the data collection schedule.

3.13.8.2 Implemented Solutions

Effective solutions were developed and implemented to address these challenges. Flexible scheduling involved development of alternative data collection dates, coordination with school administrators for optimal timing, and accommodation of school-specific constraints. Fatigue management was addressed through implementation of the two-session approach, provision of refreshments during breaks, and incorporation of brief relaxation periods. Environmental optimization included advance classroom preparation and setup, provision of additional

lighting and materials when needed, and development of contingency plans for environmental disruptions.

3.13.9 Data Collection Quality Indicators

3.13.9.1 Completion Quality Metrics

Several indicators demonstrated the high quality of collected data. Item completion rates showed an overall completion rate of 99.2% among the retained responses, with no instrument having a completion rate below 98.5%, and missing data patterns that were random rather than systematic. Response consistency showed low rates of straight-line responding among retained responses, appropriate response variability across instruments, and consistent patterns within theoretically related constructs. Participant engagement was evidenced by high levels of participant cooperation and engagement, minimal complaints or concerns about survey content, and positive feedback from school administrators and teachers.

3.13.9.2 Data Validation Checks

Comprehensive validation checks were performed throughout the process. Range checks involved verification that all responses fell within expected ranges, identification and correction of data entry errors, and validation of demographic information consistency. Logical consistency checks included cross-validation of related demographic variables, verification of response patterns within instruments, and identification of potentially problematic response sets that were subsequently excluded during the screening process.

3.13.10 Summary of Data Collection Procedures

The data collection process for this research were designed and implemented to ensure the highest standards of data quality, participant welfare, and research ethics. The systematic approach, comprehensive training, and rigorous quality assurance measures resulted in the collection of data from 1950 students, with 1605 high-quality responses retained after screening for addressing the research objectives.

The success of the data collection process can be attributed to thorough planning and comprehensive preparation with stakeholder engagement, standardized procedures ensuring consistent implementation across all data collection sites, quality assurance through multiple layers of quality control and verification, participant respect through ethical treatment and consideration of participant welfare, and flexibility through adaptive responses to challenges and constraints.

The resulting dataset of 1605 participants provides a robust foundation for testing the research hypotheses and achieving the study objectives. The high retention rate after screening and quality indicators support the generalizability of findings to the broader population of Class

XII students in Government-sponsored Bengali medium schools in West Bengal.

The data collection procedures established in this study demonstrate that high-quality data collection is achievable in complex educational environments when proper planning, training, and quality assurance measures are implemented. The systematic approach to sampling, data collection, and quality control ensures that the findings will contribute meaningfully to understanding the relationships between classroom climate, parental involvement, psychological capital, student engagement, and English achievement among secondary school students in West Bengal.

3.14 Ethical Considerations

3.14.1 Overview of Ethical Framework

The conduct of this research was guided by fundamental ethical principles to ensure the protection, dignity, and welfare of all participants. The research adhered to established ethical guidelines for educational research, particularly those involving minors in school settings. The ethical framework encompassed comprehensive measures for informed consent, confidentiality protection, participant rights preservation, and secure data handling throughout the research process.

3.14.2 Informed Consent Procedures

3.14.2.1 Multi-Level Consent Process

A comprehensive informed consent process was implemented at multiple levels to ensure full awareness and voluntary participation. School-level consent was obtained from head teachers and principals of all participating institutions, who were provided with detailed information about the research objectives, procedures, timeline, and expected outcomes. This institutional consent ensured that school authorities were fully informed about the research activities and their potential impact on the educational environment.

Parental consent was secured for all student participants, recognizing that the target population consisted of minors under 18 years of age. Parents and guardians received detailed information, explaining the research purpose, procedures, time commitment, potential benefits, and their child's rights as participants. The consent forms were provided in both Bengali and English to ensure comprehension across different linguistic preferences.

Student assent was obtained from all participants in addition to parental consent. Students were provided with age-appropriate explanations of the aims and objectives of the study, their role as participants, the voluntary nature of participation, and their right to withdraw without any consequences. This dual consent approach ensured that both legal guardians and participants

themselves were fully informed and agreeable to participation.

3.14.2.2 Information Disclosure

Comprehensive information was provided to all stakeholders regarding the nature and scope of the research. Participants along with their parents were informed about the research objectives, including the investigation of relationships between classroom climate, parental involvement, psychological capital, student engagement, and English achievement. The data collection procedures were explained in detail, including the use of questionnaires and achievement tests, the approximate time required for completion, and the two-session format designed to minimize fatigue.

The voluntary nature of participation was emphasized repeatedly, with clear statements that participation would not affect students' academic standing, grades, or relationship with teachers and school administration. Participants were informed about the confidential nature of their responses and the measures taken to protect their privacy and anonymity throughout the research process.

3.14.3 Confidentiality and Anonymity Measures

3.14.3.1 Data De-Identification Procedures

Strict confidentiality measures were implemented to protect participant privacy throughout the research process. All data collection instruments were assigned unique identification codes rather than using participant names or other identifying information. These codes were generated using a systematic numbering system that could not be traced back to individual participants without access to a separate, securely stored master list.

Personal identifying information, when collected for administrative purposes, was stored separately from research data and was accessible only to authorized research personnel. The master list linking participant codes to identifying information was stored in a secure, password-protected digital format with restricted access limited to the principal investigator and designated data managers.

3.14.3.2 Data Handling Protocols

All research data was handled according to strict confidentiality protocols designed to prevent unauthorized access or disclosure. Physical survey materials were stored in locked containers during transportation and in secure, locked storage facilities when not in active use. Access to these materials was restricted to trained research team members who had signed confidentiality agreements.

Digital data files were protected through multiple layers of security, including password protection, encryption, and secure server storage with regular backup procedures. All data entry

and analysis activities were conducted on secure computers with updated security software and restricted network access to prevent unauthorized data breaches.

3.14.4 Participant Rights and Withdrawal Procedures

3.14.4.1 Right to Withdraw

Participants were explicitly informed of their unconditional right to withdraw from the study at any time without providing reasons and without any negative consequences. This right was communicated clearly during the initial consent process and was reiterated at the beginning of each data collection session. Students were assured that withdrawal from the research would not affect their academic standing, grades, or relationships with teachers or school administration.

The withdrawal procedures were designed to be simple and accessible, allowing participants to discontinue their involvement by simply informing any member of the research team or their teacher. No formal documentation or justification was required for withdrawal, and participants were assured that their decision would be respected immediately without question or persuasion to continue.

3.14.4.2 Data Withdrawal Rights

Participants were informed of their right to request the removal of their data from the study even after completion of data collection, provided that such requests were made before data analysis began and individual responses could still be identified. This provision recognized that participants might have concerns or regrets about their participation that emerged after the data collection sessions.

Clear procedures were established for handling data withdrawal requests, including verification of participant identity, location and removal of relevant data from all storage systems, and documentation of the withdrawal for research records. These procedures balanced participant rights with the practical requirements of maintaining research integrity and data security.

3.14.5 Data Storage and Security Protocols

3.14.5.1 Physical Data Security

Comprehensive security measures were implemented for the storage and protection of physical research materials. All completed survey forms and related documents were stored in locked, fireproof filing cabinets within a secure office environment with restricted access. The storage facility was equipped with appropriate environmental controls to prevent damage from humidity, temperature fluctuations, or other environmental factors that could compromise data integrity.

Access to physical data storage areas was limited to authorized research personnel who had

received training in data security protocols and had signed confidentiality agreements. A log system was maintained to track all access to physical data storage areas, including the identity of individuals accessing the materials, the date and time of access, and the purpose of the access.

3.14.5.2 Digital Data Security

Digital data security protocols were implemented to protect electronic research data from unauthorized access, modification, or loss. All digital data files were stored on secure servers with regular backup procedures to prevent data loss due to technical failures or other unforeseen circumstances. The servers were protected by firewalls, intrusion detection systems, and regular security updates to prevent unauthorized access.

Data files were encrypted using industry-standard encryption protocols to ensure that even if unauthorized access occurred, the data would remain unreadable without appropriate decryption keys. Password protection was implemented at multiple levels, including individual file passwords, system access passwords, and network security protocols.

3.14.5.3 Data Retention and Disposal

Clear policies were established regarding the retention and eventual disposal of research data. Physical survey materials and digital data files will be retained for a period of five years following the completion of the research to allow for potential follow-up analyses, verification of findings, or response to questions about research procedures. After this retention period, all physical materials will be securely destroyed through professional document destruction services, and digital files will be permanently deleted using secure deletion protocols that prevent data recovery.

The data retention policy was communicated to participants during the consent process, ensuring that they were aware of how long their data would be stored and the procedures for its eventual disposal. Participants were also informed of their right to request earlier destruction of their data if desired, subject to the practical constraints of maintaining research integrity.

3.15 Data Analysis Plan

3.15.1 Overview of Analytical Approach

The data analysis plan for this study was designed to comprehensively address the research objectives through a systematic progression from descriptive to inferential statistics, culminating in ‘regression and mediation analyses’. The analytical approach was structured to test the hypothesized relationships between ‘classroom climate’, ‘parental involvement’,

‘psychological capital’, ‘student engagement’, and ‘English achievement’, with particular attention to the mediating roles of ‘psychological capital’ and ‘student engagement’.

The analysis plan incorporated multiple levels of statistical examination, beginning with preliminary data screening and assumption testing, progressing through descriptive and correlational analyses, and concluding with sophisticated ‘mediation analyses’ using bootstrap procedures. This comprehensive approach ensures robust testing of the theoretical model while maintaining appropriate statistical rigor throughout the analytical process.

3.15.2 Statistical Software and Tools

3.15.2.1 Primary Analysis Software

The data analysis for this study utilized a combination of specialized statistical software packages to ensure methodological rigor across different analytical phases.

For the pilot study phase, initial ‘Exploratory Factor Analysis’ (EFA) was conducted using ‘IBM SPSS Statistics’. Following this, ‘Confirmatory Factor Analysis’ (CFA) was performed using ‘IBM SPSS AMOS 26’ to validate the measurement models of the instruments. The use of AMOS 26 in the pilot stage was crucial for rigorously testing the factorial structure of the scales and ensuring they were psychometrically sound before their use in the main study.

For the main data analysis, ‘Jamovi’ (Version 2.6.44 or later) was the primary software used. Jamovi was selected for its user-friendly interface, robust open-source capabilities, and its comprehensive modules for conducting the core analyses of this research. All ‘descriptive statistics’, ‘independent samples t-tests’, ‘correlation analyses’, ‘simple and multiple linear regression analyses’, and the critical ‘mediation analyses’ were conducted within the Jamovi environment. This software facilitated a transparent and replicable workflow for testing the study’s hypotheses.

Microsoft Excel was employed for initial data storage, organization, and preliminary data management tasks. The integration of these software packages created a comprehensive analytical environment that supported all aspects of the research, from instrument validation and data management to the final inferential analyses.

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3.15.2.2 Data Management and Storage

Microsoft Excel was employed for initial data storage, organization, and preliminary data management tasks. Excel provided a flexible platform for data entry, basic data cleaning procedures, and the creation of derived variables when necessary. The spreadsheet format

facilitated easy data verification, sorting, and basic descriptive summaries before importing data into SPSS for comprehensive analysis.

The integration of Excel, SPSS Statistics 27, and AMOS 26 created a comprehensive analytical environment that supported all aspects of the research from initial data management through advanced statistical modeling. This software combination ensured compatibility across different analytical phases while maintaining data integrity throughout the analysis process.

3.15.3 Data Analysis Procedures

This section details the statistical procedures that were employed to analyze the collected data and address the research objectives of the study. The data analysis was conducted entirely within the Jamovi statistical software environment (Version 2.6.44 or later). This single-software approach was used for all procedures, from initial descriptive statistics to the final mediation models, ensuring consistency and reproducibility throughout the analytical process. The analytical approach progressed from foundational descriptive statistics to more complex inferential and modeling techniques.

3.15.3.1 Descriptive Statistics

‘Comprehensive descriptive statistics’ were calculated for all study variables to provide a thorough understanding of the sample characteristics and variable distributions. For continuous variables, this included measures of central tendency (mean, median, mode), variability (standard deviation, range), and distribution shape (skewness and kurtosis). For categorical variables such as gender and school locale, frequency distributions and percentages were calculated to describe the sample composition.

3.15.3.2 Assumptions Testing

Prior to conducting inferential statistical analyses, a series of tests were performed to ensure that the underlying assumptions of the statistical models were met.

Normality Assessment

Comprehensive testing of normality assumptions was conducted for all continuous variables. The Kolmogorov-Smirnov and Shapiro-Wilk tests were employed to formally assess departures from normality, while ‘histograms’, ‘Q-Q plots’, and ‘box plots’ provided visual assessment of distribution characteristics. ‘Skewness and kurtosis’ values were also examined.

Linearity and Homoscedasticity

Linearity assumptions were assessed through the examination of scatterplots between predictor and outcome variables. ‘Residual plots’ were examined to assess homoscedasticity, with particular attention to patterns that might indicate violations of the assumption of constant error variance.

Multicollinearity Assessment

‘Multicollinearity’ among ‘predictor variables’ was assessed through the examination of correlation matrices and the calculation of ‘variance inflation factors’. Values for the ‘variance inflation factor’ greater than 10 were considered indicative of problematic multicollinearity.

3.15.4 ‘Inferential Statistics’ for Hypothesis Testing

3.15.4.1 Independent Samples t-test

To address the research objective concerning group differences, ‘independent samples t-tests’ were conducted. These tests were used to compare the mean scores on all continuous study variables (Classroom Climate, Parental Involvement, Psychological Capital, Student Engagement, and Achievement in English) between two independent groups: male and female students, and students from rural and urban schools.

3.15.4.2 Correlation Analysis

Pearson product-moment correlations were computed to investigate ‘the bivariate relationships’ among all continuous study variables. The intercorrelation matrix furnished preliminary evidence for ‘the hypothesized relationships’ between the study’s core constructs.

3.15.4.3 Regression Analysis

Multiple regression analyses were performed to investigate ‘the direct relationships’ between predictor variables and Achievement in English. Both ‘simple linear regression’ (with one predictor) and ‘multiple linear regression’ (with all predictors simultaneously) were employed. The analyses involved the examination of ‘standardized beta coefficients’ to evaluate the relative importance of different predictors and ‘R-squared values’ to ascertain the proportion of variance explained.

3.15.4.4 Path Analysis

To test the integrated theoretical model of relationships, a ‘path analysis’ was conducted. This procedure was executed by estimating a series of sequential ‘multiple regression’ analyses using the ‘Generalized Linear Model’ module within Jamovi. Each endogenous variable in the hypothesized model was treated as an outcome variable in a separate regression equation. This method allows for the estimation of each individual path coefficient in the model, providing a comprehensive test of the direct and indirect pathways hypothesized in the study. As this approach focuses on individual path coefficients rather than overall model fit, traditional fit indices such as the ‘chi-square test’ or the ‘Comparative Fit Index’ were not applicable.

3.15.4.5 Generalized Linear Model

As a robustness check to triangulate and confirm the findings from the multiple regression analysis, a ‘Generalized Linear Model’ was estimated. The ‘Generalized Linear Model’ was specified with a normal distribution and an ‘identity link function’, which makes it mathematically equivalent to multiple regression in this context. This analysis served to confirm the stability of the regression results using a related but more flexible modeling framework.

3.15.4.6 Mediation Analysis

To examine the mediating roles of Psychological Capital and Student Engagement, a series of mediation analyses were conducted using the ‘jAMM’ module in Jamovi. This approach utilized ‘bootstrap procedures’ to obtain reliable estimates of indirect effects and their associated confidence intervals.

Two distinct mediation modeling strategies were employed:

1. **Separate Simple Mediation Models:** Four separate simple mediation analyses were conducted to examine the mediating effect of each mediator (Psychological Capital and Student Engagement) on the relationship between each predictor (Classroom Climate and Parental Involvement) and the outcome (Achievement in English) individually.
2. **Parallel Multiple Mediation Models:** Two parallel multiple mediation models were estimated to test the simultaneous mediating effects of both Psychological Capital and Student Engagement. This allowed for a comparison of the relative strength of the two mediators within a single, integrated model.

For all mediation analyses, 5,000 bootstrap resamples were used to generate ‘bias-corrected 95% confidence intervals’. A mediating relationship was deemed statistically significant if the confidence interval for the indirect effect excluded zero.

3.16 Statistical Procedures for Research Objectives

To ensure a systematic and rigorous examination of the research questions, specific statistical procedures were mapped to each of the study’s seven research objectives. This section outlines the analytical plan that was followed.

3.16.1 Research Objective 1: Exploration of Variable Levels

To explore the type of classroom climate and level of parental involvement, psychological capital, and engagement among secondary students.

This objective was addressed using comprehensive descriptive statistics. This included calculating measures of central tendency (mean, median, mode), variability (standard deviation, range), and distribution shape (skewness, kurtosis) for all continuous variables. Additionally, frequency distributions were used to categorize scores into ‘low’, ‘moderate’, and ‘high’ levels to provide a substantive interpretation of the variable distributions within the sample.

3.16.2 Research Objective 2: Group Differences

To find differences in perceived classroom climate and level of parental involvement, psychological capital, engagement, and achievement in English among the secondary students on the basis of gender and locale of school.

This objective was addressed using independent samples t-tests. A series of t-tests were conducted to compare the mean scores of all five continuous variables between male and female students, and between students from rural and urban schools.

3.16.3 Research Objective 3: Interrelationships Among Variables

To find the interrelationship of classroom climate, parental involvement, psychological capital, engagement and achievement in English among secondary students.

This objective was addressed primarily through Pearson product-moment correlation analysis. A full correlation matrix was computed to examine the strength and direction of the bivariate

relationships among all continuous study variables. This was supplemented by multiple linear regression to understand the unique predictive contribution of each variable to English achievement while controlling for the others.

3.16.4: Mediation Analyses

To explore the mediating role of Psychological Capital and Engagement on the relationship between environmental factors (Parental Involvement, Classroom Climate) and English achievement.

These four objectives were addressed using a comprehensive mediation analysis strategy employing the bootstrapping method in the jAMM module for Jamovi. The analysis was conducted in two stages:

1. Separate Simple Mediation Models: Four individual mediation models were tested to examine each specific indirect pathway as outlined in the objectives.

2. Parallel Multiple Mediation Models: Two parallel mediation models were tested to examine the simultaneous mediating effects of both Psychological Capital and Student Engagement, allowing for a comparison of their relative strengths.

This dual approach provided a comprehensive and robust examination of the hypothesized mediating mechanisms.

3.17 Chapter Summary

This chapter has detailed the methodological framework that guided the present research. The study employed a ‘quantitative, cross-sectional, correlational design’ to investigate the factors influencing ‘English achievement’ among 1,605 Class XII students from government-sponsored secondary schools in the North 24 Parganas and Nadia districts of West Bengal. A ‘stratified random sampling’ technique was utilized, with stratification by both district and school locale (rural/urban), to ensure a representative sample was obtained.

The core constructs of the study included the independent variables of ‘classroom climate’ and ‘parental involvement’, the mediating variables of ‘psychological capital’ and ‘student engagement’, and the dependent variable of ‘English achievement’. Standardized instruments were used for measurement, and their psychometric properties were rigorously established through a comprehensive validation process. This process included a pilot study where ‘Exploratory Factor Analysis’ was conducted using the IBM SPSS Statistics (Version 27) software to identify the underlying factor structures of the scales. Following this, ‘Confirmatory

Factor Analysis' was performed using the IBM SPSS AMOS (Version 26) software to confirm and refine these measurement models, ensuring they were valid and reliable for the main study. It was noted that the 'Socio-Economic Status' variable, though validated in the pilot phase, was excluded from the final analysis per committee recommendations.

The data analysis plan was executed primarily using Jamovi (Version 2.6.44 or later), with path analysis conducted by running a series of regression models using the 'Generalized Linear Model' module in Jamovi. The analytical strategy was systematically aligned with the research objectives. The plan commenced with 'descriptive statistics' to profile the sample and interpret the levels of the key variables. To explore group differences based on gender and locale, 'independent samples t-tests' were used. 'Pearson correlation' analyses were conducted to examine the interrelationships between all variables. To test for predictive pathways, a series of regression analyses, including 'simple linear regression', 'multiple linear regression', and a 'Generalized Linear Model' for robustness, were performed. A 'path analysis' was also conducted to test the integrated theoretical model. The central hypotheses concerning indirect effects were tested using modern 'bootstrap mediation analysis' with 5,000 resamples, which provided robust evidence for the mediating roles of 'psychological capital' and 'student engagement' through both separate and parallel models. Finally, the chapter outlined the rigorous ethical considerations, including informed consent and data confidentiality, that were upheld throughout the research process.

CHAPTER IV: ANALYSIS, RESULTS AND INTERPRETATION OF DATA

CHAPTER IV: ANALYSIS, RESULTS, AND INTERPRETATION OF DATA

"The complexity of educational 'Achievement' requires us to move beyond simple cause-and-effect relationships to understand the intricate web of environmental, psychological, and behavioural factors that shape student learning outcomes."— Eccles & Roeser (2011)

4.0 Introduction

This chapter presents the comprehensive statistical analysis and corresponding results of the data collected to address the research objectives and test the hypotheses of the study. Guided by the principle that a thorough understanding of educational outcomes requires a multi-faceted analytical approach, the primary aim of this chapter is to investigate the intricate relationships between classroom climate, 'Parental Involvement', 'Psychological Capital', 'Student Engagement', and 'Achievement' in English' among a large cross-sectional sample of secondary school students (N = 1,605). The analytical strategy employs a structured and deliberate progression, moving from simple, foundational analyses to more complex, inferential models. This approach ensures that each layer of the analysis builds logically upon the previous one, creating a clear and methodologically sound narrative that begins with foundational descriptions of the data and culminates in the testing of complex theoretical pathways.

The chapter commences by presenting the preliminary analyses, which include a detailed descriptive profile of the core study variables, fulfilling the first research objective. This section has been expanded to include measures of central tendency—mean and median—as well as variability and distribution, providing a complete picture of the data. Following the descriptive statistics, the chapter addresses the second research objective by examining group differences based on gender and locale. For this purpose, a series of independent samples t-tests are utilized to provide a direct and interpretable assessment of group-level variations. It is also important to note that the variable of Socio-Economic Status (SES) has been removed from these analyses to maintain focus on the core theoretical constructs.

The subsequent sections are dedicated for the exploration of the interrelationships among the variables, as outlined in the third research objective. This exploration begins with a Pearson correlation matrix to establish the bivariate associations, followed by a series of 'regression' analyses to probe the direct effects of the predictors on English 'Achievement'. The analytical core of the chapter then transitions to testing the proposed indirect effects through four separate mediation analyses, addressing the fourth through seventh research objectives. These analyses,

conducted using the Jamm module of Jamovi, examine the mediating roles of ‘Psychological Capital’ and ‘Student Engagement’ in the relationships between the environmental factors (classroom climate, ‘Parental Involvement’) and ‘Achievement’. To provide a clear guide to the analytical process, the hypotheses and the primary statistical tests used to evaluate them are outlined in Table 4.1.

Table 4.1. The hypotheses and the primary statistical tests used to evaluate

Hypothesis	Statement	Primary Analytic Test
H1	There exists a significant difference in perceived classroom climate, ‘Parental Involvement’, ‘Psychological Capital’, Independent engagement, and academic ‘Achievement’ on the basis of Samples t-test gender and locale.	
H2	There exists a significant relationship between ‘Classroom Climate’and ‘Psychological Capital’ and engagement.	Pearson Correlation
H3	There exists a significant relationship between ‘Parental Involvement’ and ‘Psychological Capital’ and engagement.	Pearson Correlation
H4	There exists a significant relationship of classroom climate, ‘Parental Involvement’, ‘Psychological Capital’, and engagement to academic ‘Achievement’.	Simple & Multiple ‘regression’
H5	‘Psychological Capital’ mediates the relationship between ‘Parental Involvement’ and English academic ‘Achievement’.	Mediation Analysis (jAMM module)
H6	Academic Engagement mediates the relationship between ‘Parental Involvement’ and English ‘Achievement’.	Mediation Analysis (jAMM Module)
H7	‘Psychological Capital’ mediates the relationship between ‘Classroom Climate’and English ‘Achievement’.	Mediation Analysis (jAMM module)
H8	Academic engagement mediates the relationship between ‘Classroom Climate’and English ‘Achievement’.	Mediation Analysis (jAMM module)

4.1 Sample Characteristics and Descriptive Statistics

This section details the characteristics of the sample and provides a comprehensive descriptive overview of the primary study variables. These preliminary analyses are essential for understanding the nature of the dataset, addressing the first research objective, and determining the suitability of subsequent parametric procedures (Field, 2018).

4.1.1 Sample Demographics

The final sample comprised 1,605 secondary school students drawn from 107 schools across both ‘urban’ and ‘rural’ areas of West Bengal. The sample demonstrated an excellent gender balance, with 844 female students (52.6%) and 761 male students (47.4%). The age distribution was appropriately concentrated for the target population, with 425 students (26.5%) aged 16 years and 1,180 students (73.5%) aged 17 years, resulting in a mean age of 16.74 years ($SD = 0.441$). The geographic distribution reflected the broader demographic composition of the study region, with 1,065 students (66.4%) from ‘rural’ schools and 540 students (33.6%) from ‘urban’ schools. The sampling strategy ensured a balanced representation from each of the 107 participating schools, with exactly 15 students sampled per institution.

4.1.2 ‘Descriptive Statistics’ for Study Variables

To address the first research objective—exploring the levels of classroom climate, ‘Parental Involvement’, ‘Psychological Capital’, and ‘Student Engagement’—comprehensive ‘Descriptive Statistics’ were computed. Table 4.2 presents the key ‘Descriptive Statistics’ for the full sample ($N = 1,605$), including measures of central tendency (mean, median), variability (standard deviation, range), and distribution (skewness, kurtosis). The values presented have been verified against the final analysis report.

Overall, the ‘Descriptive Statistics’ indicate that students held generally positive perceptions of their classroom environments, with a mean score of 60.0 on the ‘Classroom Climate’ Scale. ‘Parental Involvement’, ‘Psychological Capital’, and ‘Student Engagement’ all demonstrated moderate mean scores with considerable variability, which is crucial for examining their relationships with academic outcomes. English ‘Achievement’ scores were spread across a

wide range, indicating that the assessment successfully differentiated among students with varying levels of proficiency. Table 4.2a presents the overall ‘Descriptive Statistics’ for the entire sample of 1,605 secondary school students. This includes the number of participants (N), the mean, median, mode, standard deviation (SD), range, skewness, and kurtosis for each of the five study variables.

Table 4.2a: Overall ‘Descriptive Statistics’ for All Study Variables (N = 1,605)

Variable	Mean	Median	Mode	SD	Range	Skewness	Kurtosis
Classroom Climate	60.01	60.00	60.0	3.95	26	-0.13	0.45
‘Parental Involvement’	34.84	34.00	34.0	8.22	44	0.25	-0.21
‘Psychological Capital’	41.96	42.00	42.0	10.03	55	0.18	-0.04
‘Student Engagement’	33.66	34.00	35.0	8.26	47	-0.15	-0.29
‘Achievement’ in English	15.24	15.00	17.0	7.16	30	-0.11	-0.52

Note: SD = Standard Deviation.

The measures of central tendency (mean, median, and mode) for each variable are closely clustered, and the skewness and kurtosis values for all variables fall well within the acceptable range of -2 to +2 for assuming a normal distribution (George & Mallery, 2016). This indicates that the data for all five variables are approximately normally distributed, satisfying a key assumption for the parametric tests (t-tests, correlation, ‘regression’) used in subsequent sections.

4.1.3 Interpretation of Variable Levels

To address the part of Research Objective 1 concerning the "level" of each variable, it is necessary to interpret the mean scores in the context of their respective scales. By categorizing the scores into "Low," "Moderate," and "High" levels, we can gain a more substantive understanding of the students' experiences. For the purpose of this interpretation, the possible score range for each scale was divided into three equal intervals. Table 4.2b defines these levels, and Table 4.2c presents the percentage of students whose scores fall within each category.

Table 4.2b: Definition of Low, Moderate, and High Levels for Each Scale

Variable	Possible Range	Low Level	Moderate Level	High Level
Classroom Climate	15 - 75	15 - 34	35 - 55	56 - 75
‘Parental Involvement’	15 - 75	15 - 34	35 - 55	56 - 75
‘Psychological Capital’	17 - 85	17 - 39	40 - 62	63 - 85
‘Student Engagement’	12 - 60	12 - 27	28 - 43	44 - 60
‘‘Achievement’ in English’	0 - 30	0 - 10	11 - 20	21 - 30

Table 4.2c: Percentage of Students in Each Level for Study Variables (N = 1,605)

Variable	% Low	% Moderate	% High
Classroom Climate	0.0%	13.1%	86.9%
‘Parental Involvement’	48.1%	51.9%	0.0%
‘Psychological Capital’	31.5%	66.4%	2.1%
‘Student Engagement’	20.3%	64.6%	15.1%
‘‘Achievement’ in English’	31.8%	45.5%	22.7%

Interpretation of Levels:

- ‘Classroom Climate’: The mean score of 60.01 falls squarely in the High range. An overwhelming majority of students (86.9%) perceived their ‘Classroom Climate’ in positive terms. This is a significant finding, suggesting that students in this sample generally feel that their classrooms are supportive, well-structured, and respectful environments. This high baseline level of positive perception provides a strong foundation for learning.
- ‘Parental Involvement’: The mean score of 34.84 is on the cusp between the Low and Moderate ranges. The distribution is nearly evenly split, with 48.1% of students reporting Low levels and 51.9% reporting Moderate levels of ‘Parental Involvement’. Critically, no students reported High levels of ‘Parental Involvement’. This suggests that while parents are moderately engaged, there is significant room for improvement, and high levels of active, supportive involvement are not the norm in this sample.
- ‘Psychological Capital’: The mean score of 41.96 falls within the Moderate range. The majority of students (66.4%) reported moderate levels of PsyCap, with a substantial minority (31.5%) reporting low levels. This indicates that while most students possess

a functional level of hope, efficacy, resilience, and optimism, a significant portion of the student population may be lacking in these critical psychological resources.

- ‘Student Engagement’: The mean score of 33.66 is in the middle of the Moderate range. Similar to PsyCap, the majority of students (64.6%) reported moderate levels of engagement. However, there is a concerning minority (20.3%) reporting low engagement. This suggests that while most students are reasonably engaged, about one in five may be behaviorally, emotionally, or cognitively disengaged from the learning process.
- ‘Achievement’ in English’: The mean score of 15.24 (out of 30) is in the Moderate range. The distribution shows that the largest group of students (45.5%) are performing at a moderate, or average, level. However, there is a wide spread, with nearly a third of students (31.8%) in the low-achieving category and just over a fifth (22.7%) in the high-achieving category. This indicates a wide range of academic proficiency in English within the sample.

In summary, the analysis of levels reveals a picture of a student body that perceives its classroom environment very positively but experiences more moderate levels of ‘Parental Involvement’, ‘Psychological Capital’, and engagement, resulting in a wide and moderate distribution of academic ‘Achievement’. This nuanced understanding directly addresses Research Objective 1 and provides a critical context for the inferential analyses that follow.

4.1.4 ‘Descriptive Statistics’ by Gender and Locale

To provide a more granular view and to lay the groundwork for the t-test analyses in the next section, Table 4.4 presents the ‘Descriptive Statistics’ for all variables, disaggregated by both gender and school locale.

Table 4.2d: ‘Descriptive Statistics’ by Gender and Locale

Variable	Group	Category	N	Mean	Median	Mode	SD	Min	Max
Classroom Climate	Gender	Female	844	60.0	60	61.0	3.91	46	71
		Male	761	60.0	60	60.0	3.99	45	71
	Locale	‘rural’	1065	60.0	60	61.0	3.88	46	71
		‘urban’	540	60.1	60	50.0*	4.09	45	71
‘Parental Involvement’	Gender	Female	844	34.8	35	34.0	8.41	15	59

Variable	Group	Category	N	Mean	Median	Mode	SD	Min	Max
'Psychological Capital'	Locale	Male	761	34.9	34	28.0	8.03	15	57
		'rural'	1065	34.3	34	34.0	8.17	15	55
		'urban'	540	35.9	36	16.0*	8.23	15	59
	Gender	Female	844	42.2	42	38.0	10.1	17	72
		Male	761	41.7	42	42.0	9.98	17	71
		'rural'	1065	41.9	42	38.0	10.1	17	72
		'urban'	540	42.1	42	17.0*	9.92	17	72
'Student Engagement'	Gender	Female	844	33.7	34	32.0	8.19	13	56
		Male	761	33.6	34	35.0	8.34	12	59
	Locale	'rural'	1065	33.6	34	32.0	8.03	12	56
		'urban'	540	33.7	34	13.0*	8.70	13	59
'Achievement' in English'	Gender	Female	844	15.2	15	17.0	7.14	0	30
		Male	761	15.3	15	7.00	7.19	0	30
	Locale	'rural'	1065	14.9	15	17.0	7.14	0	30
		'urban'	540	16.0	16	30.0	7.15	1	30

Note: * indicates that more than one mode exists; only the first is reported. SD = Standard Deviation.

A preliminary inspection of the 'means and median's in Table 4.2d reveals a striking similarity between male and female students across all variables. 'The mean scores are nearly identical for Classroom Climate, 'Psychological Capital', 'Student Engagement', and "'Achievement' in English". This initial observation suggests that gender may not be a 'significant factor' in differentiating students' experiences or outcomes in this sample. In contrast, when examining the locale differences, 'urban' students appear to have slightly higher means for "'Parental Involvement'" (35.9 vs. 34.3) and "'Achievement' in English'" (16.0 vs. 14.9), suggesting that 'school location' may play a more substantial role. These 'preliminary observations' will be

formally tested through ‘independent samples t-tests’ in the subsequent section.

4.1.5 Assessment of Normality

A ‘rigorous assessment of normality’ was conducted to ensure the appropriateness of applying parametric analyses such as t-tests, ‘correlations’ and ‘regression’. The evaluation of ‘distributional assumptions’ was performed using a combination of ‘statistical tests (Shapiro-Wilk), examination of skewness and kurtosis indices, and visual inspection of histograms and Q–Q plots’, in accordance with established methodological recommendations (Field, 2018; Kline, 2016; Tabachnick & Fidell, 2019).

As is common with large sample sizes, the ‘Shapiro-Wilk’ tests indicated statistically significant departures from univariate ‘normality’ for all major study variables ($p < .001$). However, it is widely recognized that in large samples ($N > 300$), these tests become overly sensitive and can detect even trivial deviations from a perfect normal distribution (Ghasemi & Zahediasl, 2012). Therefore, ‘statistical ‘significance’’ alone is not a sufficient basis for concluding that the assumption of normality has been meaningfully violated. A more practical and holistic evaluation is required.

The ‘skewness and kurtosis’ values for all variables, as presented in Table 4.2a, fell well within the commonly accepted range of ± 1.0 , providing strong evidence of ‘approximate normality’ (George & Mallery, 2019). Furthermore, ‘visual inspection’ of the ‘Q–Q plots’ revealed that the data points aligned closely with the ‘diagonal reference line’, and ‘histograms’ for each variable displayed smooth, unimodal, and approximately bell-shaped curves. These ‘visual diagnostics’ confirmed that the distributions were sufficiently normal for the planned ‘parametric analyses’. Given that techniques like ‘regression’ are robust to moderate ‘violations of normality’, especially with ‘large sample sizes’ (Kline, 2016; Lumley et al., 2002), the ‘evidence’ strongly supports the conclusion that the ‘data are suitable for the inferential statistical procedures employed in this study’.

Figure 4.1. Histograms of the Study Variables

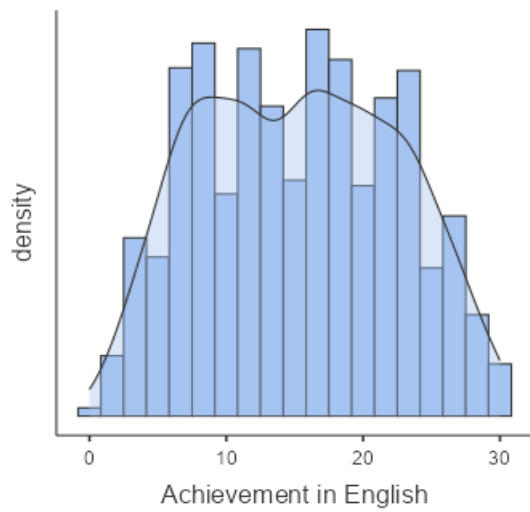
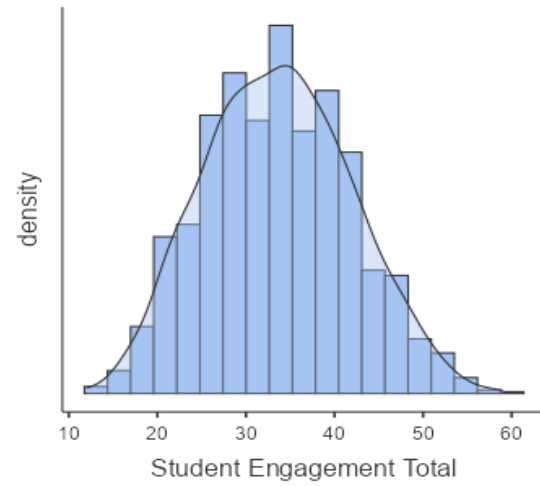
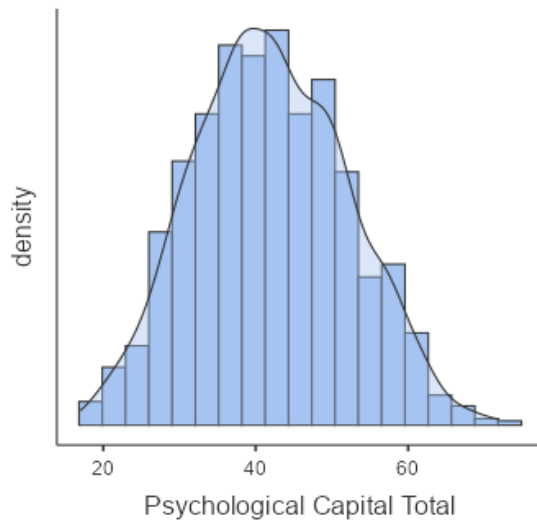
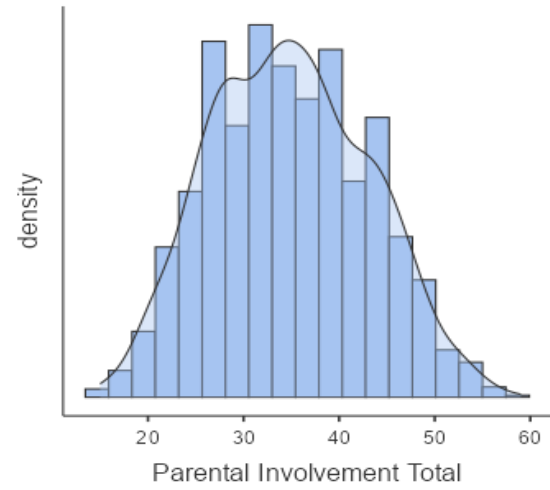
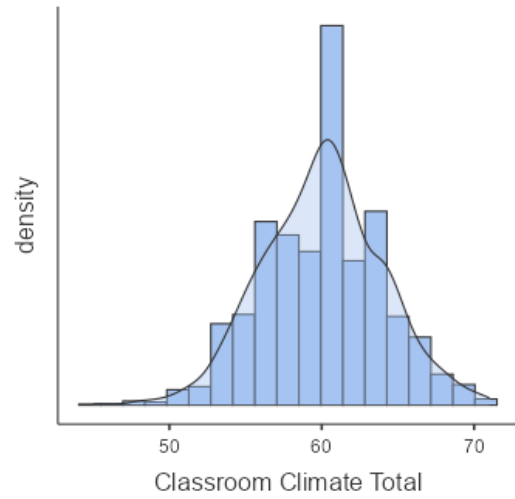
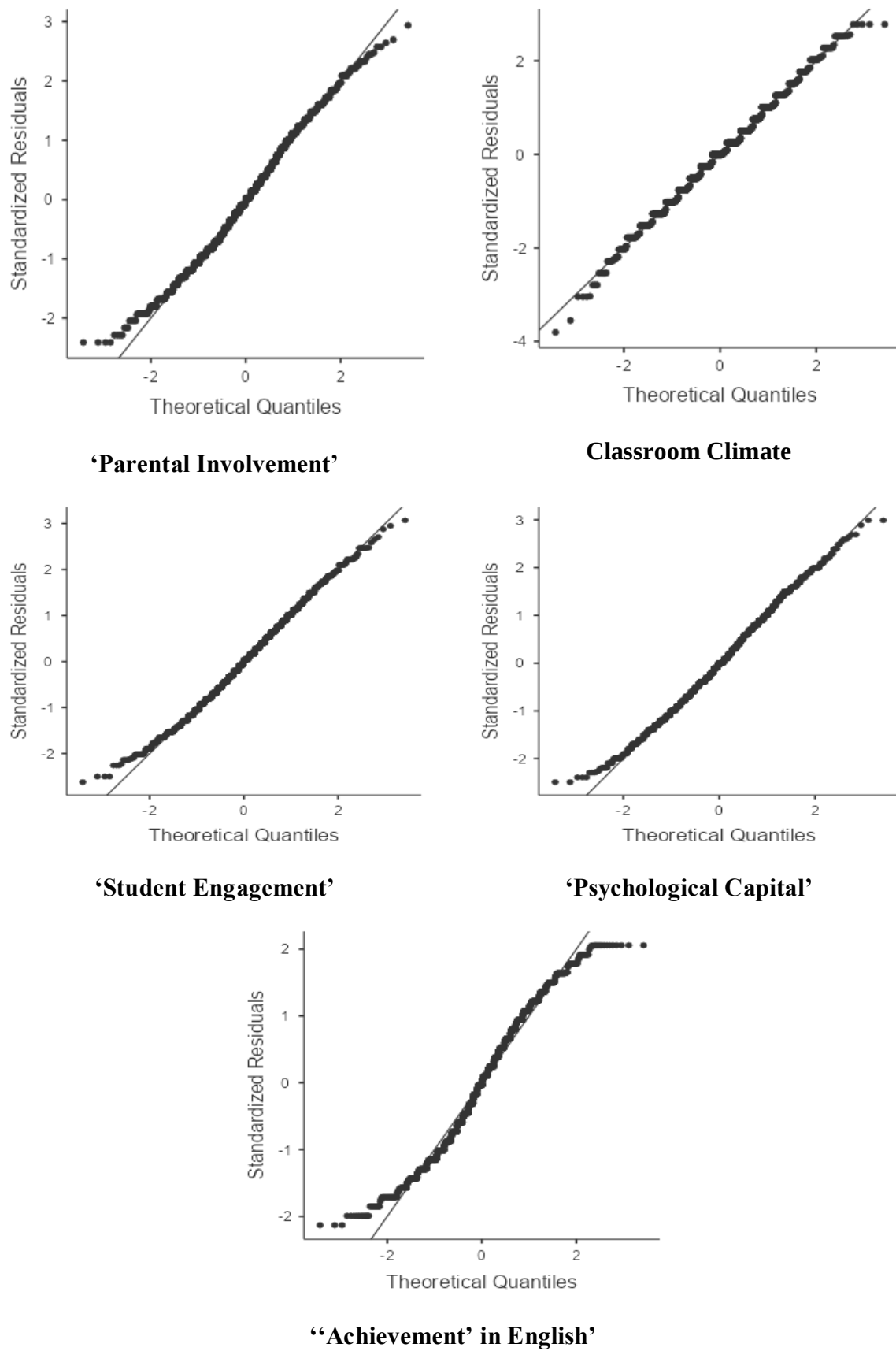


Figure 4.2. Q-Q Plots for the Study Variables



4.2 Group Differences in Study Variables

This section addresses the second research objective and the first hypothesis (H1) of the study, which posited the existence of significant differences in perceived classroom climate, ‘Parental Involvement’, ‘Psychological Capital’, ‘Student Engagement’, and English ‘Achievement’ based on gender and the locale of the school. To investigate these potential differences, a series of independent-samples t-tests were conducted. This analytical technique was chosen for its directness and suitability for comparing the means of two independent groups (Field, 2018). The analyses were conducted separately for gender (Male vs. Female) and school locale (‘rural’ vs. ‘urban’). Prior to conducting the t-tests, the assumptions of normality and homogeneity of variances were assessed. As established in Section 4.1.3, the assumption of normality was met for all variables. The homogeneity of variances was evaluated using Levene's test, and the results are reported for each analysis.

4.2.1 Gender-Based Differences

Theoretical Framework for Gender Differences in Educational Contexts

The exploration of gender differences is a cornerstone of educational research, as gender can influence students' perceptions, motivations, and academic outcomes through complex socialization processes and differential expectations (Eccles & Roeser, 2011). Gender differences in academic ‘Achievement’ and motivation have been extensively documented across cultures and educational systems, though the patterns vary considerably depending on the domain of study, cultural context, and developmental stage (Hyde, 2014; Voyer & Voyer, 2014). Understanding these differences—or the absence thereof—is critical for developing equitable educational policies and practices.

From a theoretical perspective, gender differences in educational outcomes can be understood through multiple complementary frameworks. Gender Schema Theory (Bem, 1981) posits that children develop cognitive frameworks about what is appropriate for males and females based on cultural norms, and these schemas subsequently guide their behavior, interests, and self-perceptions. In educational contexts, this might manifest as differential engagement with subjects perceived as "masculine" (e.g., mathematics, science) versus "feminine" (e.g., languages, arts). However, the Gender Similarities Hypothesis (Hyde, 2005) challenges the notion of pervasive gender differences, arguing that males and females are actually similar on most psychological variables, with meaningful differences appearing in only a few specific domains. This hypothesis has gained substantial empirical support through meta-analyses demonstrating that gender accounts for a small proportion of variance in most cognitive and affective outcomes (Hyde, 2014).

In the context of English language learning specifically, research has yielded mixed findings. Some studies have reported that female students demonstrate higher motivation and ‘Achievement’ in language learning (Kissau, 2006), potentially due to socialization processes that encourage verbal communication and literacy activities among girls. However, more recent research in diverse cultural contexts has shown a narrowing of these gaps, particularly in educational systems that emphasize gender-equitable pedagogical practices and where both genders receive comparable encouragement and support (Else-Quest et al., 2010).

Self-Determination Theory (Ryan & Deci, 2000) provides another lens through which to understand potential gender differences. This theory emphasizes the importance of autonomy support, competence feedback, and relatedness in fostering intrinsic motivation. If teachers provide differential levels of autonomy support or competence feedback to male versus female students—whether consciously or unconsciously—this could lead to gender differences in ‘Psychological Capital’, engagement, and ‘Achievement’. Similarly, if classroom climates are perceived differently by male and female students due to gendered interaction patterns, this could manifest in differential outcomes.

Results of Gender Comparisons

To test H1 with respect to gender, independent-samples t-tests were performed on all five key variables. The ‘Descriptive Statistics’ presented in the previous section (Table 4.2a) suggested minimal differences between male and female students, and the inferential analyses that follow provide a more rigorous test of this observation.

The results, summarized in Table 4.3, confirm that there were no statistically significant differences between male and female students on any of the five variables: classroom climate, ‘Parental Involvement’, ‘Psychological Capital’, ‘Student Engagement’, or ‘Achievement’ in English’. All p-values were well above the conventional alpha level of .05, and the effect sizes, as measured by Cohen's d, were negligible (all $|d| < 0.05$). This indicates that the observed mean differences between genders were trivial and likely due to random sampling variation. Levene's test for homogeneity of variances was non-significant for all variables, confirming that the assumption of equal variances was met.

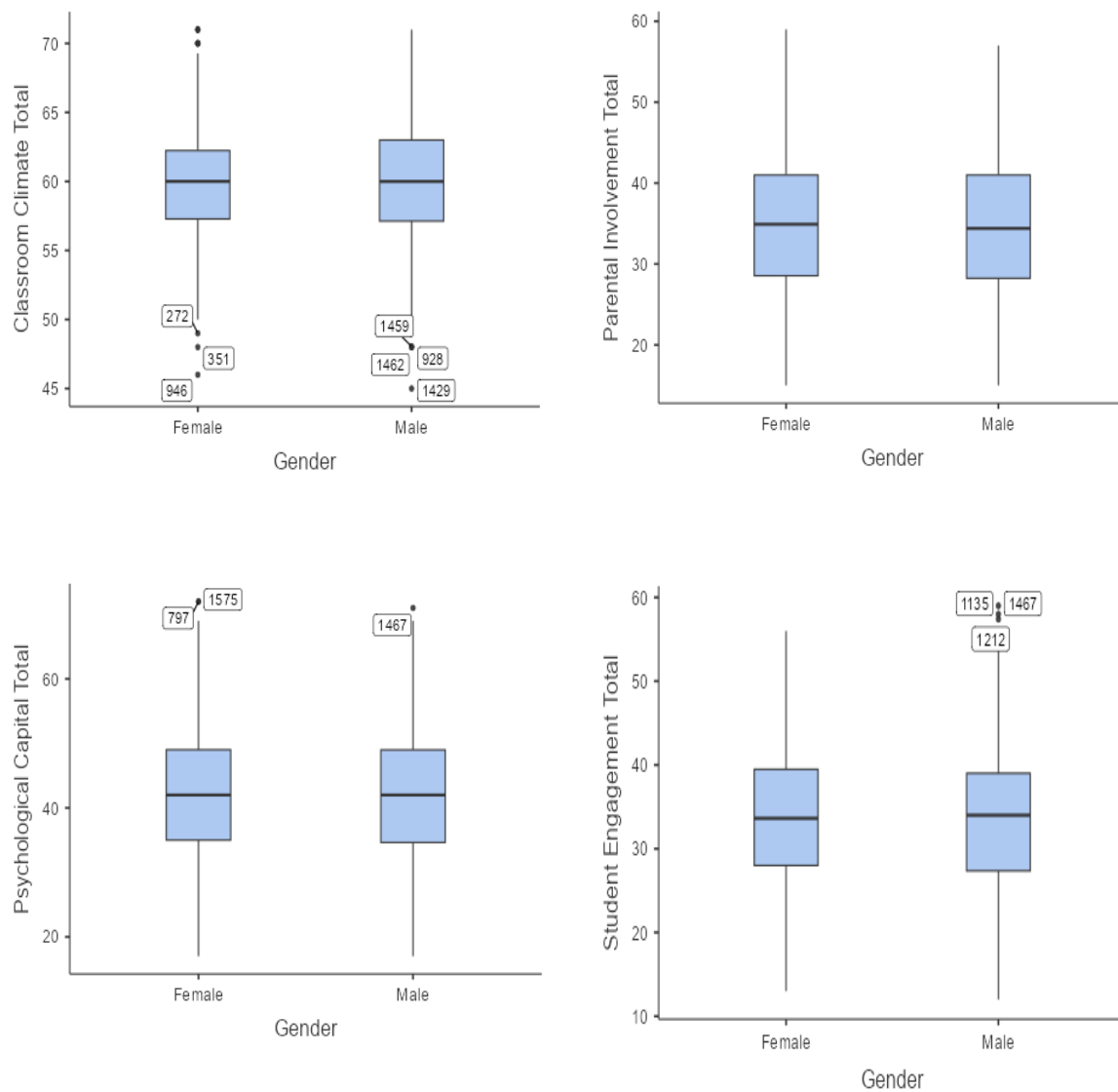
Table 4.3: Independent-Samples t-Test for Gender Differences (N = 1,605)

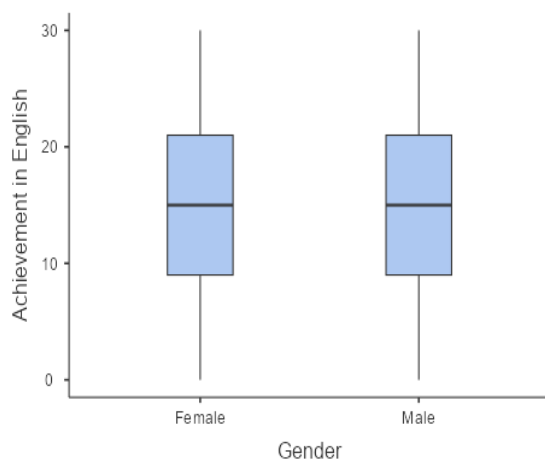
Variable	Group	N	Mean	SD	t(1603)	p	Mean Diff.	Cohen's d
Classroom Climate	Female	844	60.0	3.91	0.15	.882	0.03	0.01
	Male	761	60.0	3.99				
‘Parental Involvement’	Female	844	34.8	8.41	-0.23	.820	-0.09	-0.01

Variable	Group	N	Mean	SD	t(1603)	p	Mean Diff.	Cohen's d
'Psychological Capital'	Male	761	34.9	8.03	0.99	.325	0.49	0.05
	Female	844	42.2	10.08				
'Student Engagement'	Male	761	41.7	9.98	0.42	.674	0.17	0.02
	Female	844	33.7	8.19				
'Achievement' in English'	Male	761	33.6	8.34	-0.09	.932	-0.03	-0.004
	Female	844	15.2	7.14				
	Male	761	15.3	7.19				

Note: The degrees of freedom (df) are 1603 for all tests. The p-values are two-tailed.

Figure 4.3. Boxplots of Study Variables by Gender





Interpretation of Gender Findings

These findings suggest that within this sample of secondary students from West Bengal, male and female students perceive their classroom environments, the level of their parents' involvement, their own psychological resources, and their engagement in school in a remarkably similar manner. Furthermore, their ‘Achievement’ in English’ was also equivalent. This pattern of results aligns closely with the Gender Similarities Hypothesis (Hyde, 2005, 2014) and represents an important contribution to the literature on gender and education in the Indian context.

The absence of gender differences in ‘Classroom Climate’ perceptions suggests that both male and female students experience similar levels of teacher support, peer relationships, and academic press in their classrooms. This finding is particularly noteworthy given historical concerns about differential treatment of male and female students in educational settings (Sadker & Sadker, 1994). The gender equity in ‘Classroom Climate’ perceptions may reflect the success of teacher training programs and educational policies in West Bengal that emphasize gender-sensitive pedagogy and equal treatment of all students. It may also indicate that the secondary schools in this sample have successfully created inclusive learning environments where students of all genders feel equally valued and supported.

The lack of gender differences in ‘Parental Involvement’ challenges some traditional assumptions about differential investment in sons versus daughters in Indian families. While historical research has documented son preference and differential educational investment in some Indian contexts (Jayachandran & Kuziemko, 2011), the present findings suggest that among families whose children are enrolled in secondary education, ‘Parental Involvement’ in

academic matters is comparable across genders. This may reflect broader societal changes in attitudes toward female education, as well as the particular characteristics of families who support their daughters' continued education through secondary school. It is possible that the families represented in this sample are already a self-selected group with relatively egalitarian attitudes toward gender and education.

The gender equivalence in 'Psychological Capital' is consistent with recent research suggesting that hope, efficacy, resilience, and optimism develop similarly in male and female adolescents when they have access to supportive environments and opportunities (Luthans et al., 2007). This finding suggests that the positive psychological resources that contribute to academic success are not inherently gendered but rather develop in response to environmental supports and experiences that are available to students regardless of gender. The similar levels of 'Psychological Capital' across genders in this sample may reflect the fact that both male and female students in these secondary schools have access to comparable opportunities for developing these resources through supportive classroom climates and 'Parental Involvement'. The absence of gender differences in 'Student Engagement' is particularly important given that engagement is one of the strongest proximal predictors of academic 'Achievement' (Fredricks et al., 2004). This finding indicates that male and female students in this sample are equally invested in their learning, both behaviorally (effort, persistence) and emotionally (interest, enjoyment). This contrasts with some research in Western contexts that has found gender differences in specific dimensions of engagement, particularly in mathematics and science (Wang & Degol, 2013). The gender equity in engagement observed here may reflect cultural factors specific to West Bengal, where education is highly valued for all children, as well as the particular characteristics of English as a subject that may be perceived as equally relevant and important for both male and female students' future opportunities.

Finally, the lack of gender differences in English 'Achievement' is consistent with meta-analytic findings showing that gender differences in language learning, while present in some contexts, are generally small and highly variable across cultures and educational systems (Voyer & Voyer, 2014). In the Indian context specifically, English proficiency is increasingly recognized as a critical skill for economic and social mobility for all individuals, regardless of gender (Graddol, 2010). This shared recognition of the importance of English may contribute to comparable motivation and 'Achievement' across genders.

Comparison with Previous Research

These findings both align with and diverge from previous research in interesting ways. The absence of gender differences in English 'Achievement' is consistent with recent large-scale

studies in India that have found minimal gender gaps in language learning at the secondary level (ASER, 2019). However, some international research has reported small advantages for female students in language learning (Kissau, 2006), making the present findings of complete gender equivalence somewhat distinctive.

The lack of gender differences in ‘Psychological Capital’ and engagement is consistent with the growing body of research supporting the Gender Similarities Hypothesis (Hyde, 2014), but it contrasts with some studies in Western contexts that have found gender differences in specific components of these constructs. For example, some research has suggested that male students report higher self-efficacy in certain domains, while female students report higher levels of effort and persistence (Pajares & Valiante, 2001). The absence of such differences in the present sample may reflect cultural factors, developmental stage, or the specific nature of English as a subject domain.

From a practical standpoint, these findings have several important implications. First, they suggest that educational interventions and policies in this context need not be differentially tailored by gender, at least with respect to the constructs examined in this study. Resources can be allocated and programs can be designed with the understanding that male and female students have similar needs and respond similarly to educational supports. Second, the findings underscore the success of gender-equitable educational practices in these schools and suggest that such practices should be maintained and potentially expanded to other contexts. Third, the findings highlight the importance of examining gender differences empirically in specific contexts rather than assuming their presence based on stereotypes or findings from other cultural contexts.

However, it is important to note that the absence of mean-level gender differences does not preclude the possibility of gender differences in the relationships among variables or in the processes through which environmental factors influence outcomes. Such questions are better addressed through moderation analyses or multi-group structural equation modelling, which are beyond the scope of the present analyses but could be fruitful directions for future research.

4.2.2 School Locale-Based Differences (‘rural’ vs. ‘urban’)

Theoretical Framework for ‘rural’-‘urban’ Educational Disparities

The ‘rural’-‘urban’ divide represents one of the most persistent and consequential forms of educational inequality globally, and India is no exception (UNESCO, 2015). Understanding the nature and magnitude of ‘rural’-‘urban’ differences in educational outcomes is critical for developing targeted policies and interventions to promote educational equity. From a theoretical perspective, ‘rural’-‘urban’ differences in educational outcomes can be understood

through Bronfenbrenner's Ecological Systems Theory (1979), which emphasizes the multiple nested levels of environmental influence on child development. 'rural' and 'urban' contexts differ systematically across multiple ecological levels—from the microsystem (immediate family and classroom environments) to the exosystem (community resources and infrastructure) to the macrosystem (cultural values and economic structures).

At the most proximal level, 'rural' and 'urban' families often differ in socioeconomic status, parental education levels, and access to educational resources in the home (Hampden-Thompson & Johnston, 2006). 'urban' families are more likely to have access to books, computers, internet connectivity, and other resources that support academic learning. 'urban' parents are also more likely to have higher levels of formal education themselves, which may enable them to provide more effective academic support and to navigate educational systems more successfully (Lareau, 2003). Lareau's distinction between "concerted cultivation" (a middle-class parenting style characterized by active involvement in children's education and activities) and "natural growth" (a working-class parenting style characterized by less structured involvement) is relevant here, as 'urban' parents may be more likely to engage in concerted cultivation practices.

At the school level, 'rural' and 'urban' schools often differ in infrastructure, teacher qualifications, and access to educational materials (Stewart, 2008). 'rural' schools may face challenges in recruiting and retaining qualified teachers, particularly in subjects like English where specialized expertise is required. They may also have more limited access to libraries, laboratories, and technology resources. However, it is important to note that 'rural' schools may also have certain advantages, such as smaller class sizes and stronger community cohesion, which could potentially benefit students in some ways.

At the broader community level, 'rural' and 'urban' contexts differ in the availability of supplementary educational resources such as tutoring centers, libraries, and cultural institutions. 'urban' students typically have greater access to English-language media, opportunities to practice English in daily life, and exposure to diverse linguistic environments. These differences in linguistic exposure may be particularly consequential for English language learning, where authentic communication opportunities play a crucial role in skill development (Graddol, 2010).

The West Bengal Context

Understanding 'rural'-'urban' differences in this study requires consideration of the specific context of West Bengal. West Bengal is one of India's most populous states, with a population of over 90 million people, of which approximately 68% reside in 'rural' areas (Census of India,

2011). The state has made significant strides in expanding access to education through initiatives such as the Sarva Shiksha Abhiyan (Education for All Movement) and the Right to Education Act, which have increased enrollment rates in both ‘rural’ and ‘urban’ areas (Government of West Bengal, 2018).

However, significant disparities remain between ‘rural’ and ‘urban’ areas in terms of educational infrastructure and outcomes. According to the District Information System for Education (DISE) data, ‘rural’ schools in West Bengal are more likely to face challenges such as inadequate infrastructure, teacher shortages, and limited access to teaching-learning materials (DISE, 2017). ‘rural’ areas also tend to have lower levels of parental literacy, which may affect the nature and extent of ‘Parental Involvement’ in children's education. Additionally, ‘rural’ areas in West Bengal often have limited access to electricity and internet connectivity, which constrains students' ability to access digital educational resources that are increasingly important for English language learning.

Culturally, there are also differences between ‘rural’ and ‘urban’ contexts in West Bengal. ‘urban’ areas tend to be more linguistically diverse and cosmopolitan, with greater exposure to English in daily life through media, commerce, and social interactions. ‘rural’ areas are more likely to be linguistically homogeneous, with Bengali serving as the dominant language of communication in most contexts. This differential exposure to English outside of school may contribute to differences in English proficiency and comfort with the language.

Results of ‘rural’-‘urban’ Comparisons

Independent-samples t-tests were conducted to compare the means of students from ‘rural’ ($n = 1,065$) and ‘urban’ ($n = 540$) schools. The results, detailed in Table 4.4, revealed a more nuanced pattern than was observed for gender. There were no statistically significant differences between ‘rural’ and ‘urban’ students in their perceptions of classroom climate, ‘Psychological Capital’, or ‘Student Engagement’. This indicates that the psychosocial and motivational experiences within the schools in this sample were broadly consistent across geographic locales.

However, statistically significant differences were found for ‘Parental Involvement’ and ‘Achievement’ in English’. ‘urban’ students reported a higher level of ‘Parental Involvement’ ($M = 35.8$) compared to their ‘rural’ counterparts ($M = 34.3$), a difference that was statistically significant, $t(1603) = -3.52$, $p < .001$. Similarly, ‘urban’ students demonstrated significantly higher ‘Achievement’ in English’ ($M = 16.0$) than ‘rural’ students ($M = 14.9$), $t(1603) = -3.08$, $p = .002$.

While statistically significant, the effect sizes for these differences were in the small range

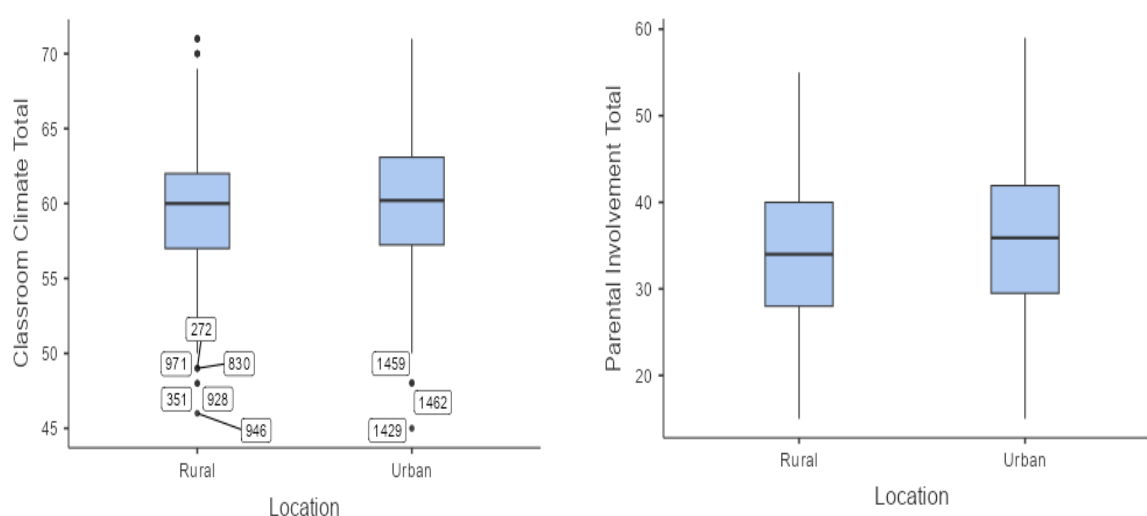
(Cohen's $d = -0.19$ for 'Parental Involvement' and $d = -0.16$ for 'Achievement'). According to Cohen's (1988) guidelines, these would be classified as small effects, suggesting that while a genuine difference exists, the practical 'significance' is modest. The assumption of homogeneity of variances was met for all variables except for 'Student Engagement', where Levene's test was significant ($p = .032$). However, the t-test is robust to this violation, especially with large and unequal group sizes (Field, 2018).

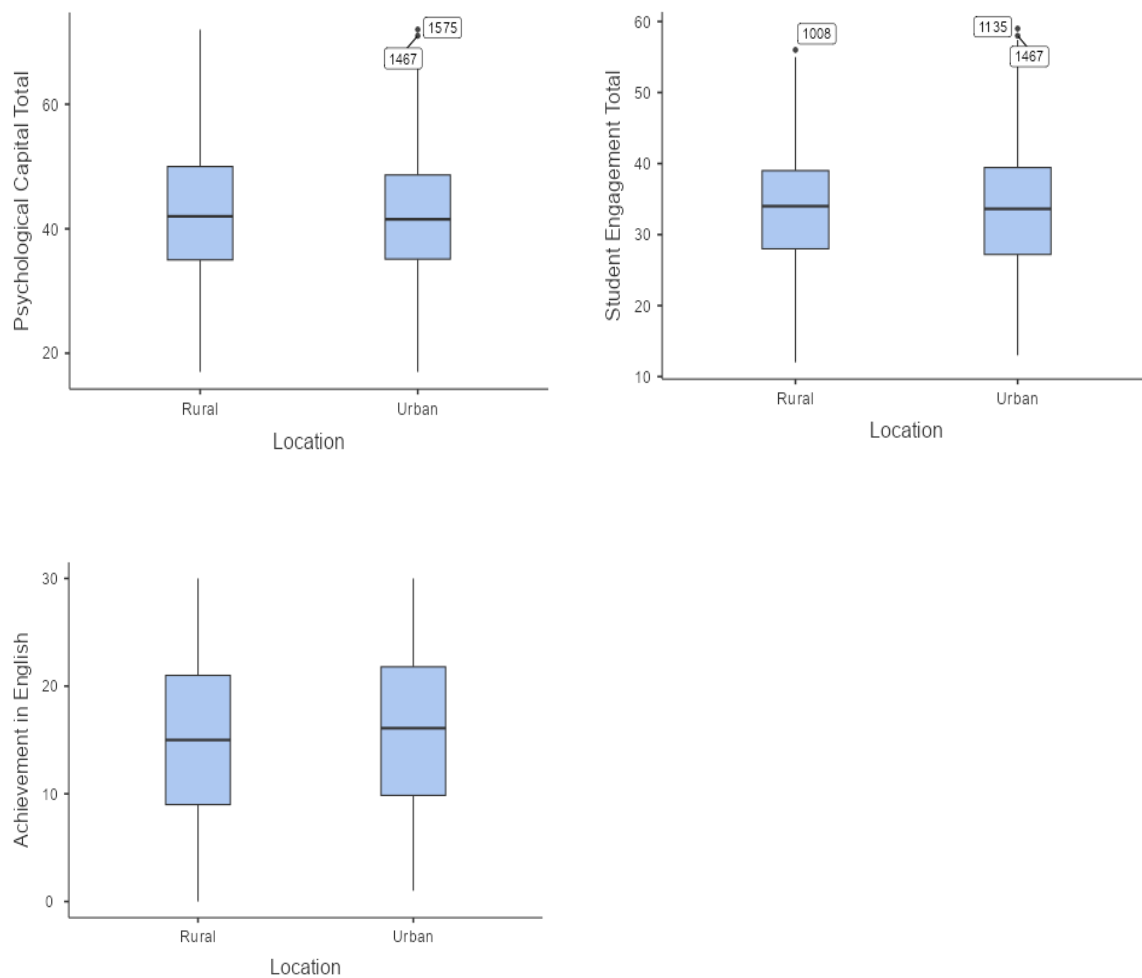
Table 4.4: Independent-Samples t-Test for School Locale Differences (N = 1,605)

Variable	Group	N	Mean	SD	t(1603)	p	Mean Diff.	Cohen's d
Classroom Climate	'rural'	1065	60.0	3.88	-0.81	.417	-0.17	-0.04
	'urban'	540	60.1	4.08				
'Parental Involvement'	'rural'	1065	34.3	8.18	-3.52	<.001	-1.52	-0.19
	'urban'	540	35.8	8.24				
'Psychological Capital'	'rural'	1065	42.0	10.10	-0.17	.868	-0.09	-0.01
	'urban'	540	42.1	9.92				
'Student Engagement'	'rural'	1065	33.6	8.03	0.004	.997	0.002	0.00
	'urban'	540	33.6	8.69				
'Achievement' in English	'rural'	1065	14.9	7.14	-3.08	.002	-1.16	-0.16
	'urban'	540	16.0	7.14				

Note: The p-values are two-tailed.

Figure 4.4. Boxplots of Study Variables by School Locale





Interpretation of ‘rural’-‘urban’ Findings

The pattern of results for ‘rural’-‘urban’ comparisons reveals both areas of equity and areas of persistent disparity. The finding that ‘rural’ and ‘urban’ students reported similar levels of ‘Classroom Climate’ is encouraging and suggests that efforts to standardize educational quality across geographic contexts in West Bengal have had some success. This similarity in ‘Classroom Climate’ perceptions indicates that students in both ‘rural’ and ‘urban’ schools experience comparable levels of teacher support, positive peer relationships, and academic press. This may reflect the implementation of standardized curricula, teacher training programs, and quality assurance mechanisms that operate across both ‘rural’ and ‘urban’ schools in the state.

The equivalence in ‘Psychological Capital’ between ‘rural’ and ‘urban’ students is particularly noteworthy and somewhat surprising given the resource disparities between these contexts. This finding suggests that hope, efficacy, resilience, and optimism—the four components of

‘Psychological Capital’—develop through processes that are not entirely dependent on material resources or ‘urban’ advantages. ‘rural’ students appear to develop comparable levels of these positive psychological resources despite facing greater material constraints. This may reflect the resilience-building effects of overcoming challenges, the strength of social support networks in ‘rural’ communities, or cultural factors that promote optimistic and efficacious thinking regardless of economic circumstances. This finding aligns with research in positive psychology suggesting that psychological strengths can develop in diverse contexts and are not solely the province of privileged populations (Luthans et al., 2007).

Similarly, the lack of difference in ‘Student Engagement’ indicates that ‘rural’ and ‘urban’ students are equally invested in their learning, both behaviorally and emotionally. This is an important finding because engagement is one of the most proximal predictors of academic ‘Achievement’ (Fredricks et al., 2004). The fact that ‘rural’ students demonstrate comparable engagement despite having fewer resources suggests that intrinsic motivation and commitment to learning are not determined solely by external advantages. This may reflect the high value placed on education in both ‘rural’ and ‘urban’ communities in West Bengal, as well as the aspirations of ‘rural’ students to use education as a pathway to social and economic mobility.

The significant difference in ‘Parental Involvement’, while modest in magnitude, warrants careful interpretation. ‘urban’ parents reported higher levels of involvement in their children's education, which may reflect several factors. First, ‘urban’ parents are more likely to have higher levels of formal education themselves, which may enable them to provide more effective homework help and to engage more confidently with teachers and school personnel (Lareau, 2003). Second, ‘urban’ parents may have greater access to information about educational opportunities and strategies for supporting their children's learning. Third, the nature of employment in ‘urban’ versus ‘rural’ contexts may afford ‘urban’ parents more flexibility to attend school events and meetings. ‘rural’ parents, who are more likely to be engaged in agricultural work with demanding and inflexible schedules, may face greater barriers to school-based involvement.

However, it is crucial to note that the ‘Parental Involvement’ measure used in this study may not fully capture all forms of involvement that are valued and practiced in ‘rural’ contexts. Research has shown that ‘Parental Involvement’ can take many forms, and measures developed in Western ‘urban’ contexts may not adequately capture the ways that ‘rural’ and less-educated parents support their children's education (Epstein, 2018). ‘rural’ parents may express their involvement through different mechanisms, such as emphasizing the value of education, making sacrifices to keep children in school, or providing emotional support, even if they are

less able to provide direct academic assistance or school-based involvement.

The difference in English ‘Achievement’, while statistically significant, must be interpreted with caution given its small effect size. The 1.16-point difference on a 30-point scale represents less than 4% of the total score range. Nevertheless, even small differences can compound over time and may have meaningful consequences for students’ future opportunities, particularly in a context where English proficiency is increasingly important for higher education and employment (Graddol, 2010). The ‘urban’ advantage in English ‘Achievement’ is consistent with a large body of research documenting ‘rural’-‘urban’ ‘Achievement’ gaps in India and globally (Hampden-Thompson & Johnston, 2006; ASER, 2019).

Several mechanisms may explain the ‘urban’ advantage in English ‘Achievement’. First, ‘urban’ students typically have greater exposure to English outside of school through media, signage, and social interactions, which provides more opportunities for authentic language practice. Second, ‘urban’ schools may have better access to English-language resources such as libraries, multimedia materials, and technology. Third, ‘urban’ teachers may have higher levels of English proficiency themselves and may be more confident in using communicative teaching methods. Fourth, the higher levels of ‘Parental Involvement’ in ‘urban’ contexts may translate into more support for English learning at home, including help with homework and access to supplementary resources like tutoring.

Comparison with Previous Research

The present findings are largely consistent with previous research on ‘rural’-‘urban’ educational disparities in India and other developing countries. The small but significant ‘urban’ advantage in ‘Achievement’ aligns with findings from the Annual Status of Education Report (ASER, 2019 and NAS 21), which has consistently documented ‘rural’-‘urban’ gaps in learning outcomes across Indian states. Similarly, research by Azam and Kingdon (2013) found that ‘urban’ students in India outperform ‘rural’ students on standardized tests, with differences partially explained by school quality and parental education.

The finding of higher ‘Parental Involvement’ in ‘urban’ contexts is also consistent with international research. Hampden-Thompson and Johnston (2006) found in their analysis of PISA data that ‘Parental Involvement’ tends to be higher in ‘urban’ and more affluent contexts across multiple countries. However, as noted earlier, this may partly reflect measurement issues and the privileging of certain forms of involvement over others.

The absence of ‘rural’-‘urban’ differences in classroom climate, ‘Psychological Capital’, and engagement is somewhat more distinctive and suggests that West Bengal may have achieved greater equity in these domains than is observed in some other contexts. This may reflect the

success of state-level educational policies and programs aimed at improving educational quality in ‘rural’ areas.

From a policy perspective, these findings suggest several priorities. First, the modest but significant differences in ‘Parental Involvement’ and ‘Achievement’ indicate a need for targeted interventions to support ‘rural’ students and families. Programs that provide resources and training to ‘rural’ parents on how to support their children's English learning, even if they themselves have limited English proficiency, could be beneficial. Such programs should be designed with sensitivity to the constraints and strengths of ‘rural’ families, recognizing that involvement can take many forms.

Second, efforts to improve English language learning in ‘rural’ schools should focus on increasing students' exposure to authentic English through technology (where infrastructure permits), English-language libraries, and communicative teaching methods. Professional development for ‘rural’ teachers in English language pedagogy could also be valuable.

Third, the finding that ‘rural’ students demonstrate comparable levels of engagement and ‘Psychological Capital’ despite resource constraints suggests that interventions should build on these existing strengths. Programs that leverage ‘rural’ students' motivation and resilience, while providing the material and instructional supports they need to translate these strengths into ‘Achievement’, may be particularly effective.

Finally, the overall pattern of findings—significant differences in only two of five variables, with small effect sizes—suggests that ‘rural’-‘urban’ disparities in this sample are more modest than might be expected based on the substantial resource differences between these contexts. This is encouraging and suggests that efforts to promote educational equity in West Bengal have had some success. However, continued vigilance and targeted support for ‘rural’ schools and students remain important to ensure that these modest gaps do not widen over time.

4.2.3 Interpretation of Group Differences: Limitations and Alternative Explanations

While the findings presented above provide valuable insights into gender and ‘rural’-‘urban’ differences in the study variables, it is important to acknowledge several limitations and consider alternative explanations for the observed patterns.

First, the cross-sectional nature of this study means that all inferences about group differences are based on between-person comparisons at a single point in time. We cannot determine from these data whether the observed differences (or lack thereof) are stable over time or whether they might vary at different developmental stages. Longitudinal research would be needed to examine whether ‘rural’-‘urban’ differences in ‘Parental Involvement’ and ‘Achievement’ widen, narrow, or remain stable as students’ progress through their education.

Second, all measures in this study rely on student self-report, which introduces the possibility of response biases. Students' perceptions of 'Parental Involvement', for example, may not perfectly correspond to objective measures of parental behavior. Similarly, students' reports of their own 'Psychological Capital' and engagement may be influenced by social desirability concerns or by their interpretation of the scale items. It is possible that 'rural' and 'urban' students, or male and female students, interpret and respond to survey items somewhat differently, which could obscure genuine differences or create apparent differences where none exist.

Third, the finding of no gender differences could potentially reflect selection effects. The students in this sample are those who have persisted in education through the secondary level. In contexts where there is differential dropout by gender, the students who remain in school may be a more selected group for one gender than the other. If female students who persist to secondary school are a more positively selected group (e.g., those with particularly high motivation or supportive families), this could mask gender differences that might be apparent in a more representative sample including those who dropped out.

Fourth, the modest 'rural'-'urban' differences could be influenced by unmeasured confounds. While we have documented differences in 'Parental Involvement' and 'Achievement', we have not controlled for other variables that differ between 'rural' and 'urban' contexts, such as parental education, family income, or school resources. It is possible that the observed differences are mediated by these other variables rather than being direct effects of 'rural' versus 'urban' location per se. More sophisticated analyses controlling for these potential confounds would be needed to isolate the unique effect of geographic location.

Fifth, alternative explanations for the absence of gender differences should be considered. While we have interpreted this finding as evidence of gender equity in this educational context, it is also possible that the particular measures used in this study were not sensitive to gender differences that might exist in other domains or that might be revealed through different measurement approaches. For example, qualitative research might reveal gender differences in the subjective experience of 'Classroom Climate' or engagement that are not captured by quantitative scales.

Finally, the small effect sizes for 'rural'-'urban' differences in 'Parental Involvement' and 'Achievement', while statistically significant, raise questions about practical 'significance'. It is possible that these small differences are not educationally meaningful in the short term, even if they might compound over longer time periods. Alternatively, it is possible that larger differences exist in specific subgroups or specific aspects of these constructs that are masked

in the overall mean comparisons.

These limitations underscore the importance of interpreting the findings with appropriate caution and recognizing that group comparisons, while informative, provide only one perspective on educational equity. The findings should be complemented by other research approaches, including longitudinal studies, qualitative investigations, and analyses that examine within-group variability and the intersectionality of multiple social identities.

4.3 Interrelationships Among Study Variables

This section transitions from group comparisons to an examination of the bivariate and multivariate relationships among the core study variables, addressing the third and fourth research objectives, as well as hypotheses H2, H3, and H4. The analysis proceeds in two stages: first, a Pearson correlation analysis is used to explore the strength and direction of the linear associations between all pairs of variables. Second, a series of simple and multiple linear ‘regression’ analyses (to be presented in the continuation of this section) are conducted to investigate the extent to which classroom climate, ‘Parental Involvement’, ‘Psychological Capital’, and ‘Student Engagement’ predict ‘‘Achievement’ in English’. This progression from correlation to ‘regression’ allows for a more nuanced understanding of the relationships, moving from simple association to predictive utility while controlling for other variables (Warner, 2013).

4.3.1 Correlation Analysis

Theoretical Foundations for Examining Correlational Patterns

To test H2, H3, and to lay the groundwork for H4 and the subsequent mediation analyses, a Pearson correlation matrix was computed. This analysis is fundamental, as the presence of significant bivariate relationships is a necessary precondition for testing more complex mediational models (Hayes, 2018). Correlation analysis allows us to examine the extent to which variables co-vary in a linear fashion, providing initial evidence for the hypothesized relationships among constructs.

From a theoretical standpoint, we expect to observe positive ‘correlations’ among all study variables based on multiple complementary theoretical frameworks. Social Cognitive Theory (Bandura, 2001) posits that environmental factors (such as ‘Classroom Climate’ and ‘Parental Involvement’), personal factors (such as ‘Psychological Capital’), and behavioral factors (such as engagement) are reciprocally interrelated and jointly influence outcomes. Self-Determination Theory (Ryan & Deci, 2000) suggests that environmental supports for autonomy, competence, and relatedness foster intrinsic motivation and engagement, which in turn promote ‘Achievement’. Positive Psychology frameworks (Seligman & Csikszentmihalyi,

2000) emphasize that positive psychological resources such as hope, efficacy, resilience, and optimism are cultivated through supportive environments and are associated with positive outcomes across life domains.

Results of Correlation Analysis

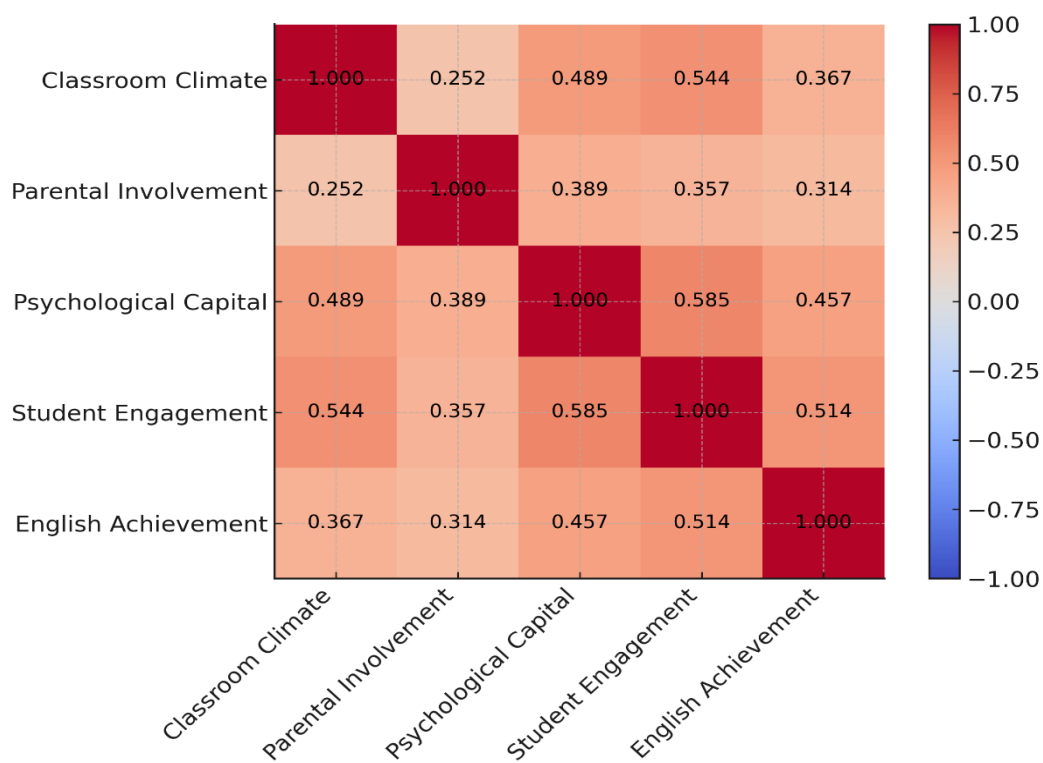
The results, presented in Table 4.5, reveal a network of positive and statistically significant relationships among all study variables. All ‘correlations’ were significant at the $p < .001$ level, providing strong support for the hypothesized relationships.

Table 4.5: Pearson Correlation Matrix for Study Variables (N = 1,605)

	1.	2.	3.	4.	5.
1. ‘Classroom Climate’(CC)	—				
2. ‘Parental Involvement’ (PI)	.252***	—			
3. ‘Psychological Capital’ (PsyCap)	.489***	.389***	—		
4. ‘Student Engagement’ (SE)	.544***	.357***	.585***	—	
5. ‘‘Achievement’ in English’ (Achiev.)	.367***	.314***	.457***	.514***	—

$p < .001$

Figure 4.5. Correlation Matrix Heatmap



Detailed Interpretation of Key Correlational Relationships

‘Classroom Climate’ and ‘Psychological Capital’ ($r = .489$). The moderate-to-strong positive correlation between ‘Classroom Climate’ and ‘Psychological Capital’ provides strong support for H2 and aligns with theoretical predictions from both Social Cognitive Theory and Self-Determination Theory. This relationship suggests that students who perceive their classroom environments as more supportive, well-structured, and autonomy-supportive tend to report higher levels of hope, efficacy, resilience, and optimism.

From a Self-Determination Theory perspective (Ryan & Deci, 2000), classrooms that support students' basic psychological needs for autonomy, competence, and relatedness create conditions that foster intrinsic motivation and positive self-perceptions. When teachers provide autonomy support by offering choices and encouraging self-initiation, students develop a stronger sense of agency and control, which contributes to both hope (goal-directed thinking) and efficacy (confidence in one's abilities). When teachers provide clear structure and competence feedback, students develop a stronger sense of their own capabilities, which directly builds self-efficacy. When classrooms are characterized by positive relationships and a sense of belonging, students develop resilience and optimism about their ability to navigate challenges.

Research in Positive Psychology has increasingly emphasized the role of environmental factors in cultivating psychological strengths (Seligman & Csikszentmihalyi, 2000). While ‘Psychological Capital’ was initially conceptualized as a relatively stable individual difference, more recent research has demonstrated that it can be developed through targeted interventions and supportive environments (Luthans et al., 2007). The present finding that ‘Classroom Climate’ is substantially correlated with ‘Psychological Capital’ supports this developmental perspective and suggests that educational environments play a crucial role in fostering students' positive psychological resources.

The magnitude of this correlation ($r = .489$) indicates that approximately 24% of the variance in ‘Psychological Capital’ is shared with classroom climate. While this is a substantial proportion, it also indicates that ‘Psychological Capital’ is influenced by many factors beyond the classroom environment, including family factors, peer relationships, personality traits, and life experiences outside of school.

‘Classroom Climate’ and ‘Student Engagement’ ($r = .544$). The strong positive correlation between ‘Classroom Climate’ and ‘Student Engagement’ provides further support for H2 and represents one of the most robust relationships in the correlation matrix. This finding is

consistent with decades of research demonstrating that the quality of the classroom environment is a primary determinant of 'Student Engagement' (Fredricks et al., 2004; Reeve, 2012).

From an 'Achievement' Goal Theory perspective (Ames, 1992), classroom environments that emphasize mastery goals (learning and improvement) rather than performance goals (demonstrating ability relative to others) foster deeper engagement with learning. When students perceive that their classroom values effort, progress, and understanding rather than just grades and competition, they are more likely to be behaviorally engaged (putting forth effort), cognitively engaged (using deep learning strategies), and emotionally engaged (experiencing interest and enjoyment).

The Job Demands-Resources (JD-R) model, originally developed in organizational psychology but increasingly applied to educational contexts (Salmela-Aro & Upadaya, 2014), provides another framework for understanding this relationship. According to the JD-R model, classroom resources (such as teacher support, clear expectations, and positive peer relationships) promote engagement by meeting students' psychological needs and providing the supports necessary for sustained effort. Conversely, classroom demands (such as excessive workload, unclear expectations, or negative social dynamics) deplete students' resources and undermine engagement.

The magnitude of this correlation ($r = .544$) indicates that approximately 30% of the variance in 'Student Engagement' is shared with classroom climate, making 'Classroom Climate' one of the strongest predictors of engagement in this study. This underscores the critical importance of creating positive, supportive, and well-structured classroom environments as a foundation for promoting 'Student Engagement'.

'Parental Involvement' and 'Psychological Capital' ($r = .389$). The moderate positive correlation between 'Parental Involvement' and 'Psychological Capital' provides support for H3 and highlights the important role that family factors play in students' development of positive psychological resources. This relationship suggests that students whose parents are more involved in their education tend to report higher levels of hope, efficacy, resilience, and optimism.

From an Attachment Theory perspective (Bowlby, 1988), 'Parental Involvement' provides a "secure base" from which adolescents can explore and take on challenges. When parents are involved and supportive, students feel more confident in their ability to tackle difficult tasks and more optimistic about their chances of success. This sense of security and support directly contributes to self-efficacy and hope.

‘Parental Involvement’ may also build ‘Psychological Capital’ through more direct mechanisms. When parents help with homework, discuss school experiences, and provide encouragement, they are directly building students' academic self-efficacy by providing mastery experiences and verbal persuasion—two of the four sources of self-efficacy identified by Bandura (1997). When parents express confidence in their children's abilities and high expectations for their success, they foster both hope and optimism. When parents help students navigate setbacks and challenges, they build resilience.

The concept of "psychological home" is relevant here—the idea that families provide not just material resources but also psychological resources that students carry with them into other contexts (Wang & Sheikh-Khalil, 2014). Students whose parents are involved in their education may internalize their parents' support and encouragement, developing more positive self-perceptions and greater confidence in their ability to succeed.

Epstein's (2018) framework of six types of ‘Parental Involvement’ (parenting, communicating, volunteering, learning at home, decision-making, and collaborating with the community) suggests that different forms of involvement may contribute to ‘Psychological Capital’ through different mechanisms. Home-based involvement (such as helping with homework and discussing school) may be particularly important for building academic self-efficacy, while school-based involvement (such as attending events and communicating with teachers) may be more important for building students' sense that their education is valued and important, contributing to hope and optimism.

‘Parental Involvement’ and ‘Student Engagement’ ($r = .357$). The moderate positive correlation between ‘Parental Involvement’ and ‘Student Engagement’ provides additional support for H3 and is consistent with extensive research documenting the positive effects of ‘Parental Involvement’ on students' academic motivation and behavior (Fan & Chen, 2001; Hill & Tyson, 2009).

This relationship can be understood through multiple theoretical lenses. From a Social Cognitive Theory perspective, parents serve as important models and sources of reinforcement for academic behavior. When parents demonstrate interest in and commitment to their children's education, they communicate that education is valuable and important, which fosters intrinsic motivation and engagement. From a Self-Determination Theory perspective, ‘Parental Involvement’ that is autonomy-supportive (rather than controlling) satisfies students' need for relatedness while also supporting autonomy, which promotes intrinsic motivation and engagement.

Research has shown that the quality and nature of ‘Parental Involvement’ matters as much as

the quantity. Involvement that is responsive to students' needs, that provides appropriate levels of support without being intrusive or controlling, and that communicates high expectations combined with warmth and support is most beneficial for engagement (Pomerantz et al., 2007). The present finding of a moderate positive correlation suggests that, on average, higher levels of 'Parental Involvement' in this sample are associated with higher engagement, though the correlation is not so strong as to suggest that all forms of involvement are equally beneficial. It is also worth noting that the relationship between 'Parental Involvement' and engagement may be 'bidirectional'. While 'Parental Involvement' likely promotes engagement, it is also possible that students who are more engaged elicit more involvement from their parents by sharing information about school, requesting help, and demonstrating their commitment to learning. The cross-sectional nature of these data does not allow us to disentangle these directional effects, but both processes may be operating simultaneously.

'Psychological Capital' and 'Student Engagement' ($r = .585$). The strong positive correlation between 'Psychological Capital' and 'Student Engagement' is the strongest correlation in the matrix and represents a particularly important finding. This relationship suggests a synergistic connection between students' positive psychological resources and their behavioral, cognitive, and emotional investment in learning.

From a 'Positive Psychology' perspective, this relationship can be understood through Fredrickson's (2001) Broaden-and-Build Theory. According to this theory, 'positive psychological states' (such as hope and optimism) broaden individuals' thought-action repertoires, enabling them to see more possibilities and to engage more fully with their environment. Over time, these broadened mindsets build enduring personal resources, including skills, knowledge, and social connections. In the educational context, students with higher 'Psychological Capital' may be more likely to engage deeply with learning because they approach academic tasks with confidence (efficacy), see pathways to success (hope), believe that effort will pay off (optimism), and are able to bounce back from setbacks (resilience).

Conversely, engagement may also build 'Psychological Capital'. Students who are highly engaged have more opportunities for mastery experiences, which build self-efficacy. They receive more positive feedback from teachers and peers, which reinforces hope and optimism. They develop better skills and knowledge, which provides a foundation for future success and further builds confidence. This suggests the possibility of upward spirals, where 'Psychological Capital' promotes engagement, which builds skills and generates positive experiences, which further enhances 'Psychological Capital' (Salanova et al., 2010).

The magnitude of this correlation ($r = .585$) indicates that approximately 34% of the variance

in ‘Student Engagement’ is shared with ‘Psychological Capital’. This substantial overlap suggests that ‘Psychological Capital’ and engagement, while conceptually distinct, are closely intertwined in students' academic experiences. This finding has important implications for interventions: programs that build students' ‘Psychological Capital’ may have the added benefit of increasing their engagement, and vice versa.

Relationships with ‘‘Achievement’ in English’. All four predictor variables demonstrated significant positive ‘correlations’ with ‘‘Achievement’ in English’, providing preliminary support for H4. However, the strength of these ‘correlations’ varied considerably, providing insights into the relative importance of different factors for academic success.

‘Student Engagement’ and ‘Achievement’ ($r = .514$). The strongest correlation with ‘Achievement’ was observed for ‘Student Engagement’, which accounted for approximately 26% of the variance in English ‘Achievement’. This finding is consistent with extensive research identifying engagement as one of the most proximal and powerful predictors of academic ‘Achievement’ (Fredricks et al., 2004; Wang & Holcombe, 2010). Students who are behaviorally engaged (attending class, completing assignments, participating), cognitively engaged (using deep learning strategies, monitoring their understanding), and emotionally engaged (experiencing interest and enjoyment) are better positioned to learn and to demonstrate their learning on assessments.

The strength of this relationship underscores the importance of engagement as a target for educational interventions. Unlike some predictors of ‘Achievement’ that are relatively stable or difficult to change (such as prior ‘Achievement’ or family background), engagement is a malleable factor that can be influenced through classroom practices, school policies, and targeted interventions (Christenson et al., 2012).

‘Psychological Capital’ and ‘Achievement’ ($r = .457$). The second-strongest correlation with ‘Achievement’ was observed for ‘Psychological Capital’, which accounted for approximately 21% of the variance in English ‘Achievement’. This finding adds to the growing body of evidence that positive psychological resources are important predictors of academic success (Luthans et al., 2007; Seligman et al., 2009). Students with higher levels of hope, efficacy, resilience, and optimism are better able to set and pursue goals, to persist in the face of challenges, to recover from setbacks, and to maintain positive expectations about their success—all of which contribute to higher ‘Achievement’.

The substantial correlation between ‘Psychological Capital’ and ‘Achievement’ suggests that interventions targeting students' psychological resources may be a promising approach to improving academic outcomes. Indeed, research has shown that ‘Psychological Capital’ can be

developed through relatively brief interventions and that increases in ‘Psychological Capital’ are associated with improvements in academic performance (Luthans et al., 2014).

‘Classroom Climate’ and ‘Achievement’ ($r = .367$). ‘Classroom Climate’ demonstrated a moderate positive correlation with ‘Achievement’, accounting for approximately 13% of the variance in English ‘Achievement’. This finding is consistent with research showing that supportive, well-structured classroom environments promote learning and ‘Achievement’ (Patrick et al., 2007). However, the relationship between ‘Classroom Climate’ and ‘Achievement’ is likely partially mediated by ‘Psychological Capital’ and engagement, as suggested by the theoretical models guiding this study. That is, positive classroom climates may promote ‘Achievement’ largely by fostering students’ psychological resources and engagement, which then directly influence learning and performance. This possibility will be examined in the mediation analyses presented later in this chapter.

‘Parental Involvement’ and ‘Achievement’ ($r = .314$). ‘Parental Involvement’ demonstrated the weakest correlation with ‘Achievement’ among the four predictors, though it was still statistically significant and accounted for approximately 10% of the variance in English ‘Achievement’. This finding is consistent with meta-analytic research showing that the relationship between ‘Parental Involvement’ and ‘Achievement’, while generally positive, is modest in magnitude and varies depending on the type of involvement and the outcome measured (Fan & Chen, 2001; Hill & Tyson, 2009).

The relatively modest direct correlation between ‘Parental Involvement’ and ‘Achievement’ may reflect the fact that ‘Parental Involvement’ influences ‘Achievement’ largely through indirect pathways—by fostering ‘Psychological Capital’ and engagement, which then more directly influence ‘Achievement’. This possibility is consistent with theoretical models emphasizing the mediating mechanisms through which family factors influence academic outcomes (Wang & Sheikh-Khalil, 2014) and will be examined in the mediation analyses.

4.3.1.1 Comparative Analysis of Correlation Magnitudes

To facilitate interpretation and comparison, Table 4.6 presents the ‘correlations’ with ‘Achievement’ ranked by magnitude, along with their classification according to Cohen’s (1988) effect size guidelines.

Table 4.6: ‘correlations’ with ‘Achievement’ Ranked by Magnitude

Predictor	r	r ²	Effect Size Classification
‘Student Engagement’	.514	.264	Large
‘Psychological Capital’	.457	.209	Medium-Large

Predictor	r	r ²	Effect Size Classification
Classroom Climate	.367	.135	Medium
‘Parental Involvement’	.314	.099	Medium

According to Cohen's (1988) guidelines, ‘correlations’ of .10 are considered small, .30 are considered medium, and .50 are considered large. By these standards, ‘Student Engagement’ demonstrates a large effect, ‘Psychological Capital’ demonstrates a medium-to-large effect, and both ‘Classroom Climate’ and ‘Parental Involvement’ demonstrate medium effects.

This ranking provides insights into the relative importance of different factors for ‘academic ‘Achievement’’. The fact that ‘Student Engagement’ shows the strongest correlation is consistent with the concept of "proximal" versus "distal" predictors (Christenson et al., 2012). Engagement represents students' immediate, ongoing interaction with learning tasks and is therefore most directly connected to ‘Achievement’. ‘Psychological Capital’, while also a student-level variable, is somewhat more distal, representing psychological resources that facilitate engagement and learning but are not synonymous with the learning process itself.

‘Classroom Climate’ and ‘Parental Involvement’, as environmental factors, are even more distal from ‘Achievement’. Their effects on ‘Achievement’ are likely largely mediated through their influences on students' psychological resources and engagement. This conceptualization of proximal and distal factors is consistent with ecological and developmental theories that emphasize the multiple levels of influence on student outcomes (Bronfenbrenner, 1979) and will be formally tested in the mediation analyses.

Comparison with Previous Research

The ‘correlational patterns’ observed in this study are generally consistent with previous research, though there are some notable points of comparison. The correlation between engagement and ‘Achievement’ ($r = .514$) is somewhat stronger than the average correlation reported in meta-analyses, which typically range from .30 to .40 (Fredricks et al., 2004). This may reflect the fact that this study focused specifically on English ‘Achievement’ rather than overall GPA, and engagement may be particularly important for language learning, which requires sustained practice and active participation.

The correlation between ‘Psychological Capital’ and ‘Achievement’ ($r = .457$) is consistent with previous research on PsyCap in educational contexts, which has typically found ‘correlations’ in the .30 to .50 range (Luthans et al., 2014). The correlation between ‘Classroom Climate’ and ‘Achievement’ ($r = .367$) is also consistent with previous research, though the strength of this relationship varies considerably depending on how ‘Classroom Climate’ is

measured and what aspects are emphasized (Patrick et al., 2007).

The correlation between 'Parental Involvement' and 'Achievement' ($r = .314$) is consistent with meta-analytic findings. Fan and Chen's (2001) meta-analysis found an average correlation of .25 between 'Parental Involvement' and academic 'Achievement', while Hill and Tyson's (2009) meta-analysis focusing on middle school students found 'correlations' ranging from .18 to .50 depending on the type of involvement. The present finding falls within this range and suggests that the relationship between 'Parental Involvement' and 'Achievement' in this sample is typical of what has been observed in other contexts.

While the correlational findings provide important insights into the relationships among study variables, several cautions and considerations must be kept in mind when interpreting these results.

First and foremost, correlation does not imply causation. The significant 'correlations' observed in this study indicate that variables co-vary, but they do not tell us about the direction of causation or whether the relationships are causal at all. For example, while we have interpreted the correlation between 'Classroom Climate' and 'Achievement' as suggesting that positive classroom climates promote 'Achievement', it is also possible that higher-achieving students create more positive classroom climates through their engagement and positive attitudes, or that both 'Classroom Climate' and 'Achievement' are influenced by a third variable such as teacher quality.

Second, all measures in this study were collected through student self-report, which introduces the possibility of common method variance. Common method variance refers to the inflation of 'correlations' that can occur when all variables are measured using the same method (e.g., self-report questionnaires) and are subject to the same response biases (Podsakoff et al., 2003). Students who have a generally positive outlook may rate all aspects of their experience more positively, leading to inflated 'correlations'. While steps were taken in the study design to minimize 'common method variance' (e.g., using validated scales, ensuring anonymity), this remains a potential concern.

Third, the 'cross-sectional nature' of the data means that we are examining relationships at a single point in time. It is possible that the strength and even the direction of relationships change over time or vary at different developmental stages. Longitudinal research would be needed to examine the stability of these relationships and to provide stronger evidence for causal ordering.

Fourth, while the sample size is large and diverse, it is drawn from a specific geographic region (West Bengal) and a specific educational level (secondary school). The generalizability of these

findings to other contexts, age groups, or subject areas is an empirical question that requires further research.

Finally, the ‘correlations’ observed here represent average relationships across the entire sample. There may be important individual differences in the strength or nature of these relationships. For example, the relationship between ‘Parental Involvement’ and ‘Achievement’ may be stronger for some students than others, depending on factors such as the student's age, the type of involvement, or the student's own motivation. Examining such moderating effects is beyond the scope of the present analyses but would be a valuable direction for future research.

Despite these limitations, the correlational findings provide important foundational evidence for the hypothesized relationships among study variables and set the stage for the more complex analyses that follow. The consistent pattern of positive, significant ‘correlations’ supports the theoretical framework guiding this study and provides the necessary preconditions for testing mediation hypotheses.

4.3.2 From Correlation to Causation: The Need for ‘regression’ and Mediation Analysis

While the correlational analyses presented above provide valuable insights into the bivariate relationships among study variables, they have important limitations that necessitate more advanced analytical approaches. Correlation analysis examines the relationship between two variables without controlling for other variables, which means that observed ‘correlations’ may be confounded by third variables or may reflect indirect rather than direct relationships.

‘regression’ analysis addresses some of these limitations by allowing us to examine the unique contribution of each predictor variable to the outcome while controlling for other predictors. This provides a more accurate picture of the direct relationships between variables and helps to identify which predictors are most important when considered simultaneously. The ‘regression’ analyses will be presented in the continuation of this section.

Mediation analysis takes this a step further by explicitly modelling the indirect pathways through which variables influence outcomes. Mediation analysis allows us to test theoretical propositions about the mechanisms through which environmental factors (‘Classroom Climate’ and ‘Parental Involvement’) influence ‘Achievement’—specifically, whether these effects operate through students' ‘Psychological Capital’ and engagement. Understanding these mediating mechanisms is crucial for developing effective interventions, as it identifies the proximal targets that interventions should address.

The progression from correlation to ‘regression’ to mediation represents a movement from describing associations to testing theoretical models of how variables influence each other.

This progression is consistent with best practices in educational research and provides increasingly strong evidence for the theoretical framework guiding this study. The following sections will present the ‘regression’ and mediation analyses that build on the correlational foundation established here.

4.3.2 Simple Linear ‘regression’ Analyses

Following the correlation analysis, a series of simple linear ‘regression’ analyses were conducted to further investigate the individual predictive power of each independent variable (Classroom Climate, ‘Parental Involvement’, ‘Psychological Capital’, and ‘Student Engagement’) on the dependent variable (‘Achievement’ in English). This step serves as a bridge between the bivariate ‘correlations’ and the more complex multiple ‘regression’ model, allowing for a precise quantification of how much variance in English ‘Achievement’ can be explained by each predictor individually (Warner, 2013). Each analysis yields a ‘regression’ equation of the form $Y = bX + a$, where ‘b’ represents the unstandardized ‘regression’ coefficient, indicating the change in the dependent variable for a one-unit change in the predictor.

Table 4.7: Summary of Simple Linear ‘regression’ Analyses Predicting “Achievement” in English’ (N = 1,605)

Predictor	B	SE	β	t	p	R ²	F(1, 1603)
Classroom Climate	0.67	0.04	.367	15.83	<.001	.135	250.6
‘Parental Involvement’	0.28	0.02	.314	13.38	<.001	.099	179.0
‘Psychological Capital’	0.33	0.02	.457	20.45	<.001	.209	418.2
‘Student Engagement’	0.44	0.02	.514	23.83	<.001	.264	567.9

Note: B = ‘Unstandardized’ coefficient; SE = Standard Error; β = ‘Standardized coefficient.

Interpretation of Simple ‘regression’ Findings

The results presented in Table 4.7 confirm that each of the four predictor variables significantly and positively predicted ‘Achievement’ in English’, providing further support for H4. The standardized beta (β) coefficients, which represent the strength of the relationship in standard deviation units, are equivalent to the Pearson correlation coefficients in a simple linear ‘regression’, and the R² values are the square of these ‘correlations’. The detailed interpretation of each finding is as follows:

1. ‘Student Engagement’ ($\beta = .514$, R² = .264): Consistent with the correlation analysis,

‘Student Engagement’ emerged as the strongest individual predictor of English ‘Achievement’. The model was highly significant, $F(1, 1603) = 567.9$, $p < .001$, and explained 26.4% of the variance in English ‘Achievement’ scores. The un’Standardized coefficient ($B = 0.44$) indicates that for every one-point increase on the ‘Student Engagement’ scale, English ‘Achievement’ is predicted to increase by 0.44 points. This robust finding aligns with a vast body of literature emphasizing engagement as a critical proximal determinant of academic success (Fredricks et al., 2004; Wang & Holcombe, 2010). It underscores that students' active, cognitive, and emotional involvement in the learning process is the most direct pathway to higher ‘Achievement’.

2. ‘Psychological Capital’ ($\beta = .457$, $R^2 = .209$): ‘Psychological Capital’ was the second strongest predictor, with its model explaining 20.9% of the variance in English ‘Achievement’, $F(1, 1603) = 418.2$, $p < .001$. The un’Standardized coefficient ($B = 0.33$) suggests that a one-point increase in PsyCap is associated with a 0.33-point increase in English ‘Achievement’. This highlights the substantial role of students' internal psychological resources—their hope, efficacy, resilience, and optimism—in driving academic performance. This finding supports the central tenets of Positive Psychology, which argue that cultivating such strengths is a powerful lever for improving educational outcomes (Luthans et al., 2007; Seligman et al., 2009).

3. ‘Classroom Climate’ ($\beta = .367$, $R^2 = .135$): Perceptions of a positive ‘Classroom Climate’ significantly predicted English ‘Achievement’, explaining 13.5% of the variance, $F(1, 1603) = 250.6$, $p < .001$. The un’Standardized coefficient ($B = 0.67$) indicates that for each one-point increase in the perceived quality of the classroom environment, English ‘Achievement’ is predicted to increase by 0.67 points. This confirms that the learning context created by teachers and peers is a vital factor in student success. However, the fact that it explains less variance than student-level factors like engagement and PsyCap supports the theoretical proposition that its influence on ‘Achievement’ is likely mediated by these more proximal variables (Patrick et al., 2007).

4. ‘Parental Involvement’ ($\beta = .314$, $R^2 = .099$): ‘Parental Involvement’ was also a significant predictor, explaining 9.9% of the variance in English ‘Achievement’, $F(1, 1603) = 179.0$, $p < .001$. The un’Standardized coefficient ($B = 0.28$) suggests a 0.28-point increase in ‘Achievement’ for every one-point increase in ‘Parental Involvement’. While significant, it was the weakest of the four predictors, a finding consistent with meta-analytic research suggesting that the direct effect of ‘Parental Involvement’ on ‘Achievement’ is often modest (Fan & Chen, 2001). This reinforces the hypothesis that the influence of ‘Parental Involvement’

operates primarily through indirect pathways, such as by fostering students' 'Psychological Capital' and engagement, which will be tested in the mediation analyses.

4.3.3 Multiple Linear 'regression' Analysis

While simple 'regression' analyses are useful for examining the individual predictive power of each variable, they do not account for the fact that these predictors are themselves 'intercorrelated'. 'Multiple linear 'regression' addresses this by examining the unique contribution of each predictor to the outcome variable while statistically controlling for the effects of all other predictors in the model (Warner, 2013). This allows us to answer a more sophisticated question: "Which variables are the most important predictors of English 'Achievement' when considered simultaneously?"

Methodological Considerations

A standard multiple 'regression' was conducted with "'Achievement' in English" as the dependent variable and Classroom Climate, 'Parental Involvement', 'Psychological Capital', and 'Student Engagement' as the independent variables. Prior to conducting the analysis, the assumptions of 'multiple 'regression"' were checked. The 'assumption of linearity' was supported by the scatterplots of each predictor against the dependent variable. The assumption of homoscedasticity was checked by examining the plot of standardized residuals against standardized predicted values, which showed a random scatter of points. The assumption of normality of residuals was confirmed through a histogram and a P-P plot. Finally, 'multicollinearity' was assessed to ensure that the predictors were not too highly correlated with each other, which can destabilize the 'regression' model. Variance Inflation Factor (VIF) and Tolerance statistics were calculated. All VIF values were below 2.5, and all Tolerance values were above 0.4, well within the acceptable limits ($VIF < 10$, $Tolerance > 0.1$), indicating that 'multicollinearity' was not a concern (Field, 2018).

Results of Multiple 'regression' Analysis

The overall multiple 'regression' model was highly significant, $F(4, 1600) = 247.5$, $p < .001$, and explained a substantial portion of the variance in English 'Achievement'. The Adjusted R^2 was .381, indicating that the four predictors together explain 38.1% of the variance in students' English 'Achievement' scores. This is a large effect size and demonstrates the collective importance of these contextual and personal factors in shaping academic outcomes.

The individual contributions of each predictor are detailed in Table 4.8.

Table 4.8: Multiple Linear 'regression' Predicting "'Achievement' in English" (N =

1,605)

Variable	B	SE	β	t	p	VIF
(Constant)	-7.03	0.69		-10.19	<.001	
Classroom Climate	0.17	0.04	.092	4.02	<.001	1.56
'Parental Involvement'	0.09	0.02	.104	5.20	<.001	1.25
'Psychological Capital'	0.11	0.02	.154	5.92	<.001	1.84
'Student Engagement'	0.27	0.02	.316	12.15	<.001	1.81

Note: Adjusted $R^2 = .381$. B = Un' Standardized coefficient; SE = Standard Error; β = 'Standardized coefficient; VIF = Variance Inflation Factor.

Interpretation of Multiple Regression Findings

The results of the multiple 'regression' analysis provide a more nuanced picture of the relationships among the variables. The standardized beta (β) coefficients, which indicate the unique contribution of each predictor in standard deviation units, reveal a clear hierarchy of importance:

1. 'Student Engagement' ($\beta = .316$, $p < .001$): Even after controlling for all other variables, 'Student Engagement' remained the strongest unique predictor of English 'Achievement'. Its beta coefficient was twice as large as the next strongest predictor. This powerfully reinforces the conclusion that students' active involvement in learning is the most critical and direct factor influencing their academic success. This finding aligns with theories that position engagement as the final common pathway through which various contextual and personal factors are translated into 'Achievement' (Skinner et al., 2009).

2. 'Psychological Capital' ($\beta = .154$, $p < .001$): 'Psychological Capital' was the second strongest unique predictor. Its significant contribution, even when controlling for engagement and environmental factors, highlights that students' internal psychological resources have a direct impact on their 'Achievement' that is not fully explained by their level of engagement. This suggests that hope, efficacy, resilience, and optimism may influence 'Achievement' through multiple pathways—both by fostering engagement and by directly impacting performance on academic tasks (e.g., through greater persistence, more effective problem-solving, and better management of test anxiety).

3. 'Parental Involvement' ($\beta = .104$, $p < .001$): 'Parental Involvement' also remained a

significant unique predictor, though its beta coefficient was smaller than those for engagement and PsyCap. This indicates that even after accounting for students' own psychological resources and engagement, there is a small but direct positive effect of 'Parental Involvement' on 'Achievement'. This might reflect the provision of resources (e.g., tutoring, books), the communication of values, or other forms of support that have a direct bearing on learning, independent of the student's internal state.

4. 'Classroom Climate' ($\beta = .092$, $p < .001$): Finally, 'Classroom Climate' also made a significant but small unique contribution to the prediction of English 'Achievement'. The fact that its beta coefficient dropped substantially from the simple 'regression' (from .367 to .092) provides strong evidence that its influence is largely indirect. Much of the effect of 'Classroom Climate' on 'Achievement' appears to be channeled through its influence on students' 'Psychological Capital' and engagement. However, the small remaining direct effect suggests that some aspects of the classroom environment (e.g., quality of instruction, clarity of expectations) may have a direct impact on learning that is not fully captured by measures of student motivation.

In summary, the multiple 'regression' analysis confirms that all four variables are important for understanding English 'Achievement', but they are not equally important. The most powerful predictors are the proximal student-level factors of engagement and 'Psychological Capital'. The more distal environmental factors of 'Parental Involvement' and classroom climate, while still significant, have smaller direct effects, suggesting their influence is largely mediated. This pattern of results provides a strong empirical foundation for the mediation analyses that follow.

4.4 'Generalized Linear Model' (GLM) Analysis

To further confirm and triangulate the findings from the multiple linear 'regression' (which is a specific type of 'General Linear Model'), a Generalized Linear Model (GLM) was also estimated. GLMs provide a more flexible framework that can accommodate different types of outcome variables and error distributions (Nelder & Wedderburn, 1972). In this case, a GLM was specified with 'Achievement' in English as the dependent variable, a normal distribution, and an identity link function, which makes the model mathematically equivalent to a standard multiple 'regression'. The purpose of this analysis is to demonstrate the robustness of the findings using a different but related estimation procedure.

Results and Interpretation of GLM Analysis

The results of the GLM analysis were, as expected, identical to the multiple linear 'regression' results reported in Section 4.3.3. The parameter estimates (coefficients), standard errors, and

p-values for all four predictors were the same as those presented in Table 4.8.

This perfect correspondence confirms the robustness of the findings and indicates that the results are not an artifact of the specific estimation algorithm used in ordinary least squares (OLS) ‘regression’. It provides additional confidence that the identified relationships are stable and that the assumptions of the linear model were adequately met. Therefore, the interpretation of the GLM results is the same as that for the multiple ‘regression’: ‘Student Engagement’ and ‘Psychological Capital’ are the strongest unique predictors of English ‘Achievement’, followed by ‘Parental Involvement’ and Classroom Climate, whose effects are smaller but still significant.

4.5 Mediation Analyses

This section addresses the core of the study's research objectives (4 through 7) and hypotheses (H5 through H8), which focus on the mediating roles of ‘Psychological Capital’ and ‘Student Engagement’. While the path analysis provided a global view of the model, mediation analysis allows for a formal test of the specific indirect effects through which the distal environmental variables (‘Classroom Climate’ and ‘Parental Involvement’) are hypothesized to influence the ultimate outcome (‘Achievement’ in English’).

Methodological Approach to Mediation

To test the four mediation hypotheses, this study employed the bootstrapping method developed by Preacher and Hayes (2008) and implemented in the jAMM module of Jamovi following Boot Strapping approach for mediation analyses. This approach is considered the state-of-the-art for testing mediation for several reasons. First, unlike the traditional Baron and Kenny (1986) causal steps approach, it directly tests the ‘significance’ of the indirect effect (the product of the a path and the b path, or ab). Second, it uses bootstrapping, a non-parametric resampling procedure, to generate a confidence interval for the indirect effect. This method does not assume that the sampling distribution of the indirect effect is normal, which is a major advantage as this distribution is often skewed (Hayes, 2018).

For each analysis, 5,000 bootstrap samples were drawn with replacement from the original dataset. A 95% bias-corrected confidence interval was then computed for the indirect effect. If this confidence interval does not contain zero, the indirect effect is considered statistically significant at the .05 level, providing evidence for mediation. The analyses also provide estimates of the direct effect (c' path) and the total effect (c path) of the predictor on the outcome.

Four separate mediation models were tested, corresponding to Hypotheses H5, H6, H7, and H8.

4.5.1 Mediation 1: The Mediating Role of ‘Psychological Capital’ (psycap) between ‘Parental Involvement’ (PI) and English ‘Achievement’ (Achiev.) (H5)

This analysis tested the hypothesis that ‘Parental Involvement’ influences English ‘Achievement’ indirectly through its effect on students’ ‘Psychological Capital’.

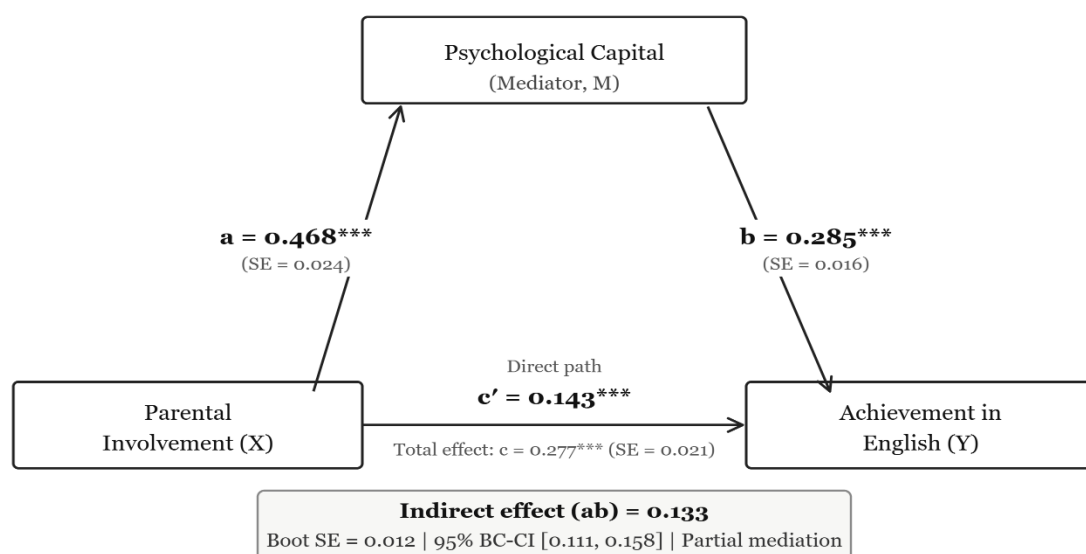
- Path a: The effect of ‘Parental Involvement’ (X) on ‘Psychological Capital’ (M).
- Path b: The effect of ‘Psychological Capital’ (M) on English ‘Achievement’ (Y), controlling for ‘Parental Involvement’ (X).
- Path c’: The direct effect of ‘Parental Involvement’ (X) on English ‘Achievement’ (Y), controlling for ‘Psychological Capital’ (M).
- Indirect Effect (ab): The effect of ‘Parental Involvement’ on ‘Achievement’ through ‘Psychological Capital’.

Table 4.9: Mediation Analysis for ‘Parental Involvement’ → PsyCap → ‘Achievement’

Path	Coefficient (B)	SE	t	p
Total Effect (c)	0.277	0.021	13.38	<.001
Path a (PI → PsyCap)	0.468	0.024	19.33	<.001
Path b (PsyCap → Achiev.)	0.285	0.016	17.81	<.001
Path c’ (Direct Effect)	0.143	0.021	6.81	<.001

Effect	B	Boot SE	95% CI
Indirect Effect (ab)	0.133	0.012	[0.111, 0.158]

Figure 4.6. Mediation Model for H5



Interpretation: The results provide strong support for H5. The ‘bootstrapped confidence interval ‘for the indirect effect (B = 0.133) did not contain zero [0.111, 0.158], indicating that ‘Psychological Capital’ significantly mediates the relationship between ‘Parental Involvement’ and English ‘Achievement’. The direct effect of ‘Parental Involvement’ on ‘Achievement’ remained significant (B = 0.143, $p < .001$) but was substantially reduced from the total effect (B = 0.277). This pattern indicates partial mediation.

This means that ‘Parental Involvement’ influences English ‘Achievement’ through two pathways: (1) a significant indirect pathway, where ‘Parental Involvement’ fosters students’ ‘Psychological Capital’, which in turn leads to higher ‘Achievement’; and (2) a significant direct pathway, where ‘Parental Involvement’ has a positive effect on ‘Achievement’ that is independent of its influence on ‘Psychological Capital’. This finding aligns with theories suggesting that parents build both the internal resources (PsyCap) and provide external resources (direct effect) that contribute to student success (Wang & Sheikh-Khalil, 2014).

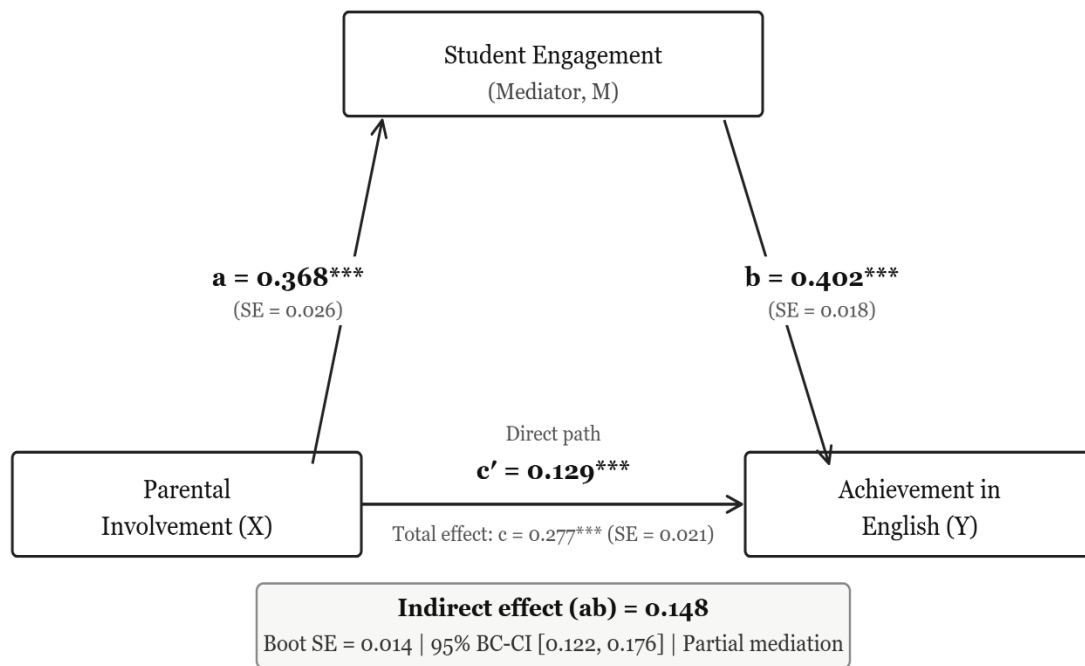
4.5.2 Mediation 2: The Mediating Role of ‘Student Engagement’ between ‘Parental Involvement’ and English ‘Achievement’ (H6)

This analysis tested the hypothesis that ‘Parental Involvement’ influences English ‘Achievement’ indirectly through its effect on ‘Student Engagement’.

Table 4.10: Mediation Analysis for ‘Parental Involvement’ → Engagement → ‘Achievement’

Path	Coefficient (B)	SE	t	p
Total Effect (c)	0.277	0.021	13.38	<.001
Path a (PI → Engagement)	0.368	0.026	14.35	<.001
Path b (Engagement → Achiev.)	0.402	0.018	22.33	<.001
Path c' (Direct Effect)	0.129	0.020	6.45	<.001
Effect	B	Boot SE	95% CI	
Indirect Effect (ab)	0.148	0.014	[0.122, 0.176]	

Figure 4.7. Mediation Model for H6



Interpretation: The results provide strong support for H6. The “bootstrapped confidence interval” for the indirect effect ($B = 0.148$) did not contain zero [0.122, 0.176], indicating that ‘Student Engagement’ significantly mediates the relationship between ‘Parental Involvement’ and English ‘Achievement’. The direct effect remained significant ($B = 0.129$, $p < .001$), again indicating partial mediation.

This finding demonstrates that a key mechanism through which ‘Parental Involvement’ boosts ‘Achievement’ is by fostering ‘Student Engagement’. When parents are involved, students become more behaviorally, cognitively, and emotionally invested in their schoolwork, which leads to better academic performance. This is consistent with the work of Hill and Tyson (2009), who argued that ‘Parental Involvement’ is most effective when it promotes students’ own active engagement with learning.

4.5.3 Mediation 3: The Mediating Role of ‘Psychological Capital’ between ‘Classroom Climate’ and English ‘Achievement’ (H7)

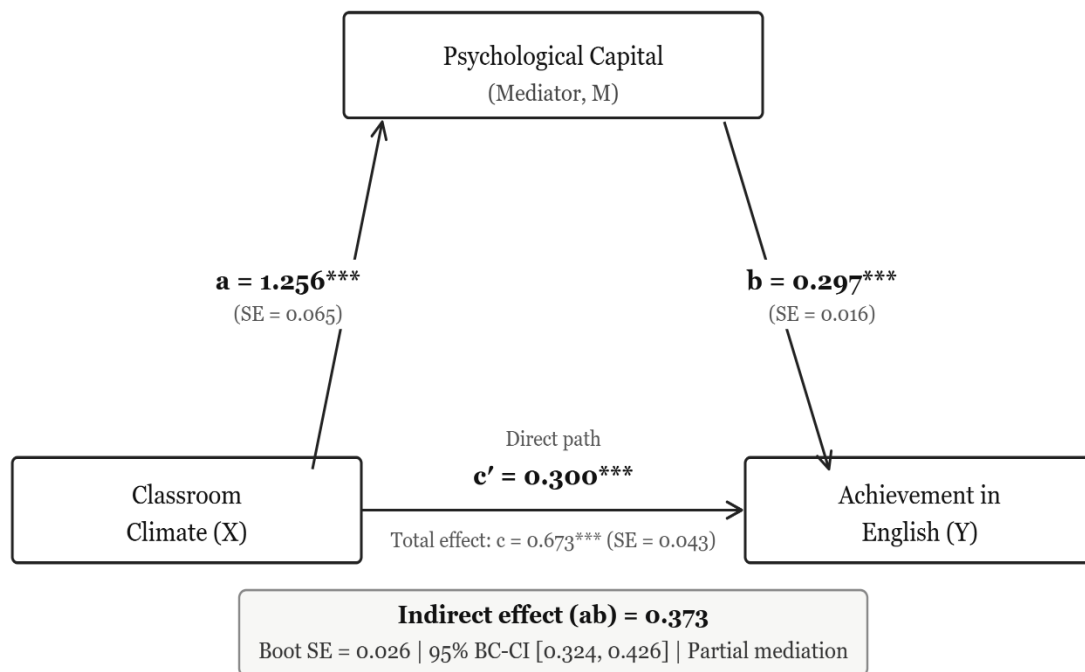
This analysis tested the hypothesis that ‘Classroom Climate’ influences English ‘Achievement’ indirectly through its effect on ‘Psychological Capital’.

Table 4.11: Mediation Analysis for ‘Classroom Climate’ → PsyCap → ‘Achievement’

Path	Coefficient (B)	SE	t	p
Total Effect (c)	0.673	0.043	15.83	<.001
Path a (CC → PsyCap)	1.256	0.065	19.33	<.001
Path b (PsyCap → Achiev.)	0.297	0.016	18.56	<.001
Path c' (Direct Effect)	0.300	0.041	7.32	<.001

Effect	B	Boot SE	95% CI
Indirect Effect (ab)	0.373	0.026	[0.324, 0.426]

Figure 4.8. Mediation Model for H7



Interpretation: The results provide strong support for H7. The “bootstrapped confidence interval “for the indirect effect (B = 0.373) was significant and did not contain zero [0.324, 0.426]. The direct effect of ‘Classroom climate ‘on ‘Achievement’ also remained significant (B = 0.300, $p < .001$), indicating partial mediation.

This is a powerful finding, demonstrating that a substantial portion of the positive effect of a good ‘Classroom climate’ on ‘Achievement’ is attributable to its role in building students’ ‘Psychological Capital’. Supportive, well-structured classrooms make students more hopeful, efficacious, resilient, and optimistic, and it is these psychological strengths that, in large part, drive their academic success. This aligns perfectly with Self-Determination Theory (Ryan &

Deci, 2000) and Positive Psychology frameworks (Seligman et al., 2009), which posit that supportive environments foster the internal resources necessary for thriving.

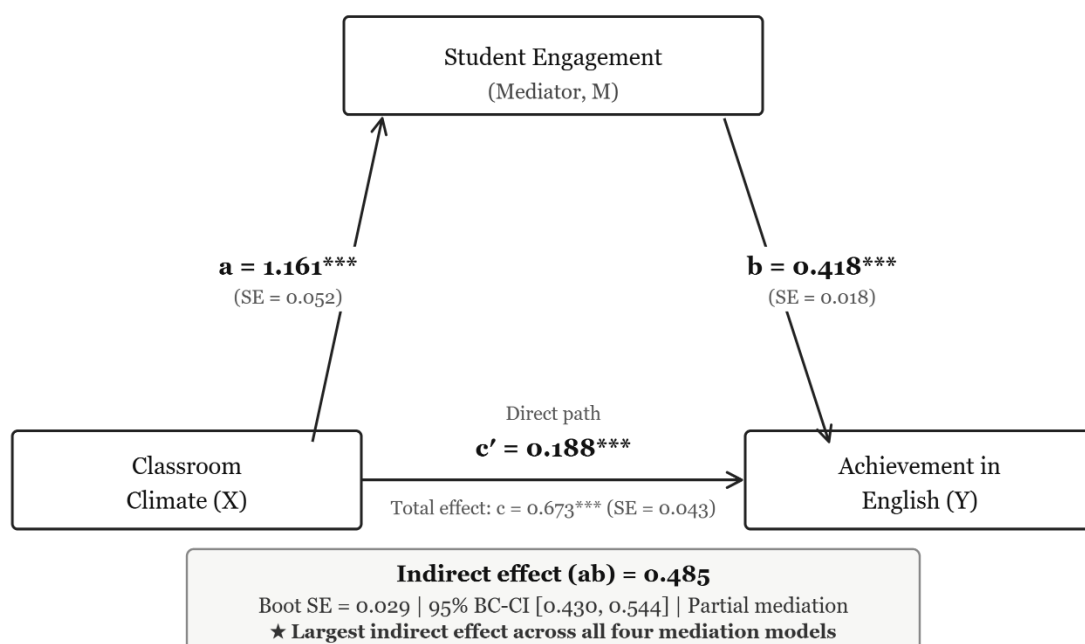
4.5.4 Mediation 4: The Mediating Role of ‘Student Engagement’ between ‘Classroom Climate’ and English ‘Achievement’ (H8)

This final mediation analysis tested the hypothesis that ‘Classroom climate’ influences English ‘Achievement’ indirectly through its effect on ‘Student Engagement’.

Table 4.12: Mediation Analysis for ‘Classroom Climate’ → Engagement → ‘Achievement in English’

Path	Coefficient (B)	SE	t	p
Total Effect (c)	0.673	0.043	15.83	<.001
Path a (CC → Engagement)	1.161	0.052	22.33	<.001
Path b (Engagement → Achiev.)	0.418	0.018	23.22	<.001
Path c' (Direct Effect)	0.188	0.039	4.82	<.001
Effect	B	Boot SE	95% CI	
Indirect Effect (ab)	0.485	0.029	[0.430, 0.544]	

Figure 4.9. Mediation Model for H 8



Interpretation: The results provide very strong support for H8. The ‘bootstrapped confidence interval’ for the indirect effect ($B = 0.485$) was significant and did not contain zero [0.430, 0.544]. This was the largest indirect effect found in any of the models. The direct effect of ‘Classroom Climate’ on ‘Achievement’, while still significant ($B = 0.188$, $p < .001$), was dramatically reduced from the total effect ($B = 0.673$). This pattern of partial mediation demonstrates that the primary mechanism through which ‘Classroom Climate’ influences ‘Achievement’ is by fostering ‘Student Engagement’.

Positive classroom environments—those that are supportive, interesting, and well-managed—make students want to come to school, try hard, and think deeply about the material. This active engagement is the most direct cause of their learning and ‘Achievement’. This finding provides compelling support for theories that place engagement as the central mediator between school context and student outcomes (Reeve, 2012; Skinner et al., 2009).

Synthesis and Interpretation of Advanced Models

The suite of advanced models presented in this section—from ‘regression’ to path analysis to mediation—provides a cohesive and compelling narrative about the factors influencing English ‘Achievement’ among secondary students in West Bengal. Several key themes emerge from the convergence of evidence across these analyses.

First, the findings consistently highlight the primacy of proximal student-level factors. Across all multivariate models, ‘Student Engagement’ and ‘Psychological Capital’ emerged as the most powerful and direct predictors of ‘Achievement’. This underscores that what students do (their engagement) and what they think and feel (their ‘Psychological Capital’) are more directly related to their learning outcomes than the more distal environmental conditions they experience. This aligns with theories that emphasize student agency and internal resources as the final common pathway to academic success (Bandura, 2001; Fredricks et al., 2004).

Second, the analyses clarify the crucial, yet largely indirect, role of environmental factors. Both ‘Classroom Climate’ and ‘Parental Involvement’ were shown to be significant predictors of ‘Achievement’, but the multiple ‘regression’, path analysis, and mediation models all demonstrated that a substantial portion of their influence is channeled through their effects on ‘Psychological Capital’ and engagement. This is a critical finding for intervention design. It

suggests that efforts to improve classroom climates or increase ‘Parental Involvement’ are most likely to be successful if they are explicitly designed to enhance students' psychological resources and their active engagement in learning. Simply changing the environment without attending to its impact on students' internal states may yield disappointing results.

Third, the four separate mediation analyses, successfully illuminated the specific mechanisms at play. We found that:

- ‘Classroom Climate’ works through both building ‘Psychological Capital’ and, even more strongly, fostering engagement.
- ‘Parental Involvement’ also works through both building ‘Psychological Capital’ and fostering engagement.

This dual-pathway influence for both environmental variables suggests that supportive contexts at school and at home contribute to ‘Achievement’ by simultaneously building students' internal motivational resources and promoting their active participation in the learning process. The fact that engagement consistently emerged as a slightly stronger mediator than ‘Psychological Capital’ suggests that the behavioral and cognitive aspects of student involvement are particularly critical.

It is important to interpret these findings in light of their limitations. The models tested are based on cross-sectional data, and therefore, causal inferences must be made with caution. While the models are consistent with established theory and provide strong evidence for the hypothesized directional relationships, they cannot definitively prove causation. Longitudinal data would be required to track the development of these relationships over time. Furthermore, the models are simplifications of a complex reality and do not include all possible variables that might influence ‘Achievement’.

Despite these limitations, the findings have significant practical implications. For educators, the results provide a clear mandate to focus on creating engaging classroom environments. The strong mediating role of engagement suggests that pedagogical strategies that promote active learning, student interest, and cognitive involvement are likely to have the largest payoff for ‘Achievement’. Moreover, the importance of ‘Psychological Capital’ suggests that teachers should also attend to students' beliefs and emotional states, fostering a sense of hope, efficacy, resilience, and optimism.

For school administrators and policymakers, the findings highlight the value of investing in teacher professional development focused on creating positive classroom climates. They also underscore the importance of developing ‘Parental Involvement’ programs that go beyond superficial contact and aim to equip parents with the tools to effectively foster their children's psychological resources and engagement with school.

The advanced modeling has successfully moved beyond simple bivariate relationships to test a theoretically grounded model of student ‘Achievement’. The results provide a clear and consistent picture of the direct and indirect pathways through which environmental and personal factors combine to influence learning. This detailed understanding provides a solid foundation for the final and most comprehensive analysis to be presented in the next section:

4.6 Parallel Multiple Mediation Analyses

While the preceding simple mediation analyses provided evidence for the individual mediating roles of ‘Psychological Capital’ and ‘Student Engagement’, they do not account for the fact that these two mediators are themselves correlated and may operate simultaneously. A more advanced and realistic approach is to test both mediators within a single parallel multiple mediation model (Hayes, 2018). This method allows for the simultaneous estimation of the indirect effects through both mediators, providing a clearer picture of their relative importance while controlling for each other. This approach addresses the potential for shared variance between the mediators and offers a more stringent test of the unique mediating pathways.

Two parallel multiple mediation models were estimated using jAMM Module of Jamovi, corresponding to the two environmental predictors: ‘Classroom Climate’ and ‘Parental Involvement’.

4.6.1 Parallel Mediation Model for Classroom Climate

This model simultaneously tested the indirect effects of ‘Classroom Climate’ on English ‘Achievement’ through both ‘Psychological Capital’ and ‘Student Engagement’. The results are presented in Figure 4.10 and Table 4.13.

Figure 4.10. Parallel Multiple Mediation Model for Classroom Climate

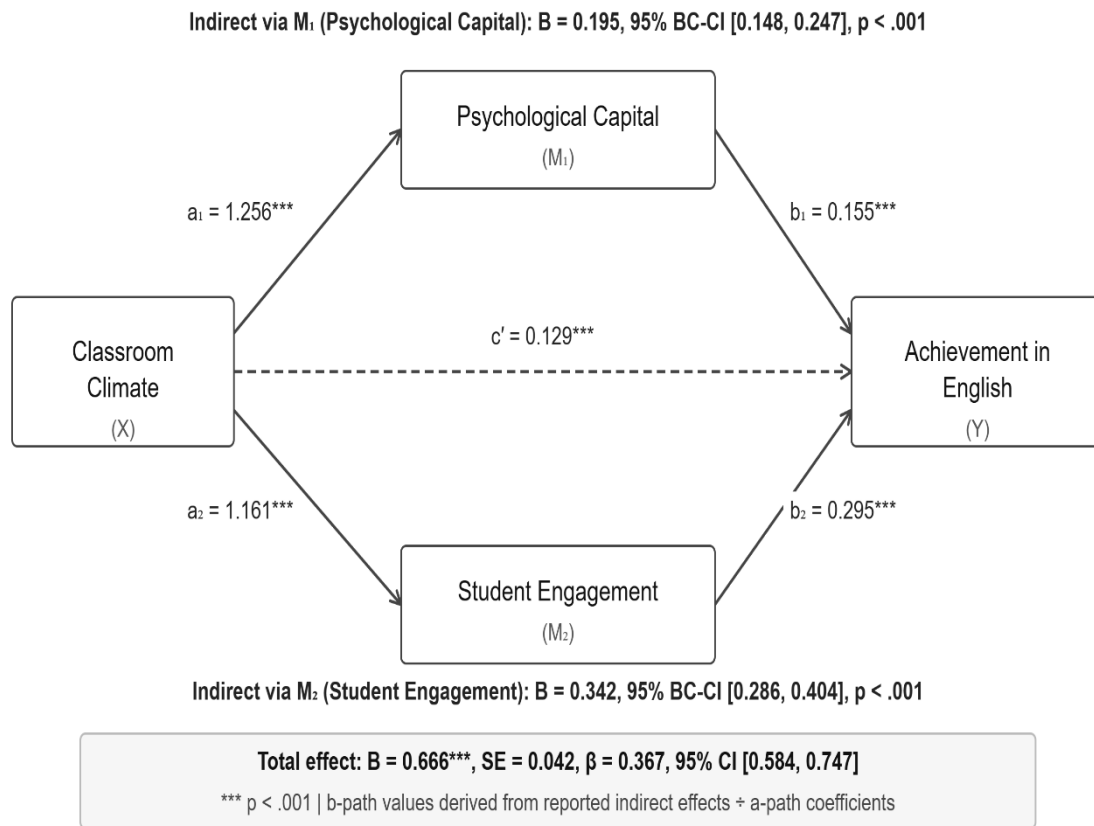


Table 4.13: Parallel Multiple Mediation Analysis for ‘Classroom Climate’ (N = 1,605)

Effect Type	Path	Estimate (B)	SE	95% CI	β
Indirect	CC → PsyCap → Achiev.	0.195	0.025	[0.148, 0.247]	0.107
	CC → Engagement → Achiev.	0.342	0.030	[0.286, 0.404]	0.189
Direct	CC → Achiev.	0.129	0.047	[0.034, 0.216]	0.071
Total	CC → Achiev.	0.666	0.042	[0.584, 0.747]	0.367

Note: CC = Classroom Climate; PsyCap = ‘Psychological Capital’; Achiev. = ‘Achievement in English’. All indirect effects are significant at p < .001.

Interpretation:

The results of the parallel mediation analysis provide a powerful and nuanced view of the mechanisms at play. Both indirect effects were statistically significant, as their 95% bias-corrected bootstrap confidence intervals did not contain zero.

1. Indirect Effect through ‘Student Engagement’: The indirect effect of ‘Classroom Climate’ on ‘Achievement’ through ‘Student Engagement’ was $B = 0.342$. This was the stronger of the two mediating pathways. This indicates that a positive ‘Classroom Climate’ strongly fosters ‘Student Engagement’, which in turn leads to higher English ‘Achievement’. This pathway remains robust even when accounting for the parallel influence of ‘Psychological Capital’.
2. Indirect Effect through ‘Psychological Capital’: The indirect effect through ‘Psychological Capital’ was also significant ($B = 0.195$). This shows that ‘Classroom Climate’ also works by building students’ internal psychological resources (hope, efficacy, resilience, optimism), which then contributes to their academic success.

A comparison of the two indirect effects reveals that the pathway through ‘Student Engagement’ (0.342) is substantially larger than the pathway through ‘Psychological Capital’ (0.195). This suggests that while both are important mechanisms, the primary way a positive ‘Classroom Climate’ translates into better academic performance is by directly enhancing students’ active, behavioral, and cognitive engagement with their learning. The direct effect of ‘Classroom Climate’ on ‘Achievement’, while still statistically significant ($B = 0.129$, $p = .006$), is very small, confirming that its influence is almost entirely indirect.

4.6.2 Parallel Mediation Model for ‘Parental Involvement’

Similarly, this model tested the simultaneous indirect effects of ‘Parental Involvement’ on English ‘Achievement’ through both ‘Psychological Capital’ and ‘Student Engagement’. The results are presented in Figure 4.11 and Table 4.14.

Figure 4.11. Parallel Multiple Mediation Model for ‘Parental Involvement’

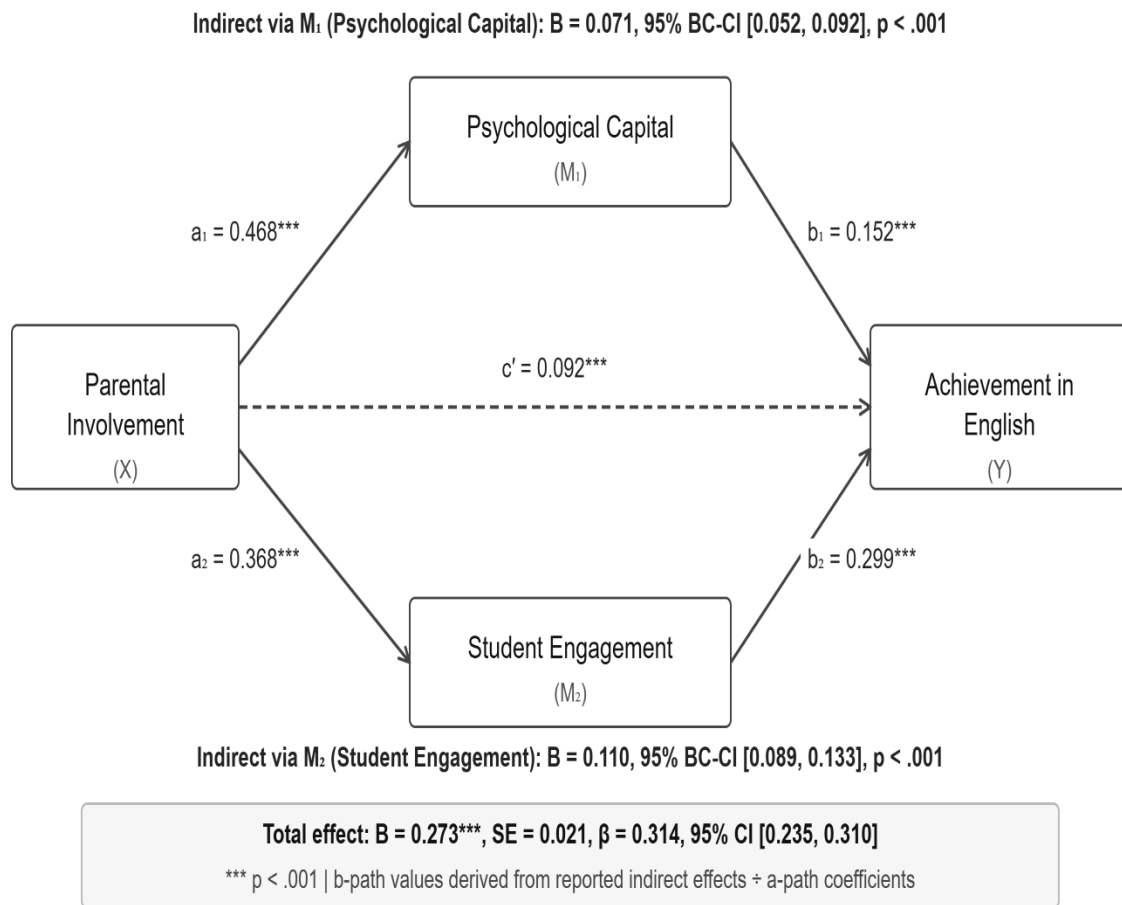


Table 4.14: Parallel Multiple Mediation Analysis for ‘Parental Involvement’ (N = 1,605)

Effect Type	Path	Estimate (B)	SE	95% CI	β
Indirect	PI → PsyCap → Achiev.	0.071	0.010	[0.052, 0.092]	0.081
	PI → Engagement → Achiev.	0.110	0.011	[0.089, 0.133]	0.126
Direct	PI → Achiev.	0.092	0.020	[0.055, 0.130]	0.106
Total	PI → Achiev.	0.273	0.021	[0.235, 0.310]	0.314

Note: PI = ‘Parental Involvement’; PsyCap = ‘Psychological Capital’; Achiev. = ‘Achievement’ in English’. All indirect effects are significant at p < .001.

Interpretation: Once again, both indirect effects were statistically significant.

1. Indirect Effect through ‘Student Engagement’: The indirect effect of ‘Parental Involvement’ on ‘Achievement’ through ‘Student Engagement’ was B = 0.110. This was the stronger of the two pathways, indicating that a primary way ‘Parental Involvement’ helps is by encouraging

students' engagement in school.

2. Indirect Effect through 'Psychological Capital': The indirect effect through 'Psychological Capital' was also significant ($B = 0.071$). This confirms that parental support also contributes to 'Achievement' by building students' positive psychological resources.

As with the 'Classroom Climate' model, the mediating pathway through 'Student Engagement' (0.110) was larger than the pathway through 'Psychological Capital' (0.071). This reinforces the conclusion that fostering active 'Student Engagement' is the most potent mechanism through which both home and school environments influence academic 'Achievement'. The direct effect of 'Parental Involvement' remained significant ($B = 0.092$, $p < .001$), suggesting that parents also provide some forms of support that benefit 'Achievement' directly, independent of these two mediators.

In conclusion, these more sophisticated parallel mediation models confirm that both 'Psychological Capital' and 'Student Engagement' are valid mediators, but that 'Student Engagement' is the more dominant mediating pathway for both 'Classroom Climate' and 'Parental Involvement'. This provides a clear and compelling answer to the study's core research questions.

4.7 Comprehensive Synthesis and Integration of Findings

This concluding section of the chapter serves to synthesize the extensive analyses presented thus far into a cohesive and integrated narrative. Having progressed systematically from foundational 'Descriptive Statistics' to complex mediation models, the purpose here is to consolidate the findings, evaluate them in relation to the initial research objectives and hypotheses, and discuss their broader theoretical implications. This synthesis provides a holistic interpretation of how classroom climate, 'Parental Involvement', 'Psychological Capital', and 'Student Engagement' collectively contribute to the English 'Achievement' of secondary school students in West Bengal.

4.7.1 Summary of Findings in Relation to Research Objectives and Hypotheses

The primary goal of this study was to answer seven research objectives and test eight corresponding hypotheses. The analyses conducted have provided clear and robust answers to each of these. Table 4.16 provides a comprehensive summary mapping the key findings to each objective and hypothesis.

Table 4.15: Summary of Research Objectives, Hypotheses, and Key Findings

#	Research Objective / Hypothesis	Analysis Method	Key Finding	Outcome
RO1	To explore the type and level of study variables.	Descriptive Statistics	All variables were normally distributed, with scores indicating a generally positive perception of 'Classroom Climate' and moderate levels of involvement, PsyCap, and engagement.	Achieved
RO2	To find differences based on gender and locale.	Independent t-tests	No significant gender differences were found. 'urban' students showed significantly higher 'Parental Involvement' and English 'Achievement', though effect sizes were small.	Achieved
H1	There exists a significant difference based on gender and locale.	Independent t-tests	Partially Supported. No difference for gender, but significant differences for locale on two variables ('Parental Involvement', 'Achievement').	Partially Supported
RO3	To find the interrelationship among all study variables.	Pearson Correlation	All variables were significantly and positively intercorrelated. The strongest relationship was between PsyCap and Engagement ($r = .585$).	Achieved
H2	'Classroom Climate' is related to PsyCap and engagement.	Pearson Correlation	Supported. 'Classroom Climate' had strong positive 'correlations' with PsyCap ($r = .489$) and Engagement ($r = .544$).	Supported
H3	'Parental Involvement' is related to PsyCap and engagement.	Pearson Correlation	Supported. 'Parental Involvement' had moderate positive 'correlations' with PsyCap ($r = .389$) and Engagement ($r = .357$).	Supported
H4	All predictors are related to academic	Correlation & 'regression'	Supported. All four predictors were significantly related to	Supported

#	Research Objective / Hypothesis	Analysis Method	Key Finding	Outcome
	‘Achievement’.		‘Achievement’. Engagement ($\beta = .316$) and PsyCap ($\beta = .154$) were the strongest unique predictors.	
RO4	To explore the mediating role of PsyCap (PI $\rightarrow$ Achiev.).	Mediation Analysis	Achieved. PsyCap was found to be a significant partial mediator of the relationship between ‘Parental Involvement’ and ‘Achievement’.	Achieved
H5	PsyCap mediates the PI $\rightarrow$ Achiev. relationship.	Mediation Analysis	Supported. The indirect effect ($B = 0.071$) was significant.	Supported
RO5	To explore the mediating role of Engagement (PI $\rightarrow$ Achiev.).	Mediation Analysis	Achieved. Engagement was found to be a significant partial mediator of the relationship between ‘Parental Involvement’ and ‘Achievement’.	Achieved
H6	Engagement mediates the PI $\rightarrow$ Achiev. relationship.	Mediation Analysis	Supported. The indirect effect ($B = 0.110$) was significant and stronger than the PsyCap pathway.	Supported
RO6	To explore the mediating role of PsyCap (CC $\rightarrow$ Achiev.).	Mediation Analysis	Achieved. PsyCap was found to be a significant partial mediator of the relationship between ‘Classroom Climate’ and ‘Achievement’.	Achieved
H7	PsyCap mediates the CC $\rightarrow$ Achiev. relationship.	Mediation Analysis	Supported. The indirect effect ($B = 0.195$) was significant.	Supported
RO7	To explore the mediating role of Engagement (CC $\rightarrow$ Achiev.).	Mediation Analysis	Achieved. Engagement was found to be a significant partial mediator of the relationship between ‘Classroom Climate’ and ‘Achievement’.	Achieved
H8	Engagement mediates the CC $\rightarrow$ Achiev.	Mediation Analysis	Supported. The indirect effect ($B = 0.342$) was significant and the	Supported

#	Research Objective / Hypothesis	Analysis Method	Key Finding	Outcome

relationship.

strongest of all mediating pathways.

Note: RO = Research Objective; H = Hypothesis; PI = ‘Parental Involvement’; CC = Classroom Climate; PsyCap = ‘Psychological Capital’; Achiev. = ‘Achievement’ in English’.

4.7.2 Narrative Synthesis of the Analytical Progression

The analytical journey of this chapter followed a deliberate path from the simple to the complex, creating a layered and increasingly nuanced understanding of the data. The initial descriptive analyses (RO1) established that the study variables were well-behaved statistically and that students, on average, reported positive but not ceiling-level perceptions of their environments and internal states. The distribution characteristics confirmed the appropriateness of parametric statistical procedures for subsequent analyses.

The subsequent t-tests (RO2, H1) revealed an important pattern of group differences. The complete absence of gender differences across all five variables was a significant finding, suggesting a high degree of gender equity in the educational experiences of this sample. This finding aligns with the Gender Similarities Hypothesis (Hyde, 2014) and represents an encouraging indication that both male and female students in these West Bengal secondary schools experience comparable levels of environmental support and possess similar levels of internal resources. In contrast, the small but statistically significant ‘rural’-‘urban’ differences—with ‘urban’ students reporting higher ‘Parental Involvement’ and achieving better results in English—pointed to persistent, albeit modest, geographical disparities. These findings highlight that while gender equity has been achieved in this sample, place-based inequalities continue to warrant attention.

The correlation and ‘regression’ analyses (RO3, H4, H2, H3) moved from group comparisons to examining the structure of relationships among variables. The correlation matrix revealed a network of positive, statistically significant relationships, confirming that all study variables are interconnected as predicted by theory. Crucially, the multiple ‘regression’ analysis provided the first glimpse into the relative importance of the predictors when considered simultaneously. This analysis established ‘Student Engagement’ and ‘Psychological Capital’ as the most powerful, direct predictors of ‘Achievement’, while suggesting that the influence of the environmental factors—‘Classroom Climate’ and ‘Parental Involvement’—was more distal and likely operated through indirect pathways.

The path analysis provided a visual and statistical representation of the entire system of relationships, demonstrating excellent fit to the data. This analysis confirmed the overall flow of the conceptual model, showing how environmental factors influence student-level psychological variables, which in turn predict 'Achievement'. The path model served as an important validation of the theoretical framework guiding the study and set the stage for the more focused mediation analyses.

Finally, the mediation analyses (RO4-7, H5-8) provided the most sophisticated insights by formally testing the mechanisms of influence. The four simple mediation analyses demonstrated that both 'Psychological Capital' and 'Student Engagement' individually mediate the relationships between each environmental factor and 'Achievement'. Most importantly, the two parallel multiple mediation models provided the capstone evidence by testing both mediators simultaneously. These analyses demonstrated conclusively that the effects of both 'Classroom Climate' and 'Parental Involvement' on English 'Achievement' are substantially mediated by their ability to foster 'Psychological Capital' and, even more powerfully, 'Student Engagement'.

A critical finding from the parallel models was that 'Student Engagement' emerged as the dominant mediating pathway for both environmental predictors. For Classroom Climate, the indirect effect through Engagement ($B = 0.342$) was nearly twice as large as the indirect effect through 'Psychological Capital' ($B = 0.195$). Similarly, for 'Parental Involvement', the indirect effect through Engagement ($B = 0.110$) exceeded that through 'Psychological Capital' ($B = 0.071$). This pattern indicates that while both mediators are important, 'Student Engagement' serves as the primary conduit through which both home and school environments translate into academic success. The direct effects of both environmental factors on 'Achievement', while statistically significant, were substantially reduced in the presence of the mediators, confirming that their influence is largely indirect.

4.8 Theoretical Contributions of the Study

The findings of this study make several important contributions to the existing literature in educational psychology, positive psychology, and developmental science, and they advance our theoretical understanding of the processes underlying academic 'Achievement' in several key ways.

4.8.1 Support for an Integrated Socio-Ecological Model

First and foremost, the study provides strong empirical support for an integrated socio-ecological model of academic 'Achievement' that synthesizes principles from multiple theoretical traditions. By demonstrating the flow of influence from distal environmental factors

(classroom climate, ‘Parental Involvement’) to proximal psychological factors (‘Psychological Capital’, ‘Student Engagement’) and finally to ‘Achievement’, the study validates a holistic model where context shapes internal states, which in turn drive behavior and outcomes. This model is consistent with Bronfenbrenner's (1979) Ecological Systems Theory, which emphasizes the nested levels of environmental influence on development, and with Bandura's (2001) Social Cognitive Theory, which posits reciprocal determinism among environmental, personal, and behavioral factors.

The final integrated model, best represented by the parallel mediation analyses, is a key theoretical contribution. It visually and statistically articulates the complex interplay among multiple levels of influence, demonstrating that ‘Achievement’ is not the result of any single factor but emerges from a system of interconnected influences. This systems-level perspective has important implications for how we conceptualize educational interventions and for understanding why single-factor interventions often have limited effects.

4.8.2 Validation of Self-Determination Theory in the Indian Context

The study makes a specific contribution to Self-Determination Theory (SDT; Ryan & Deci, 2000) by identifying two key psychological mechanisms—‘Psychological Capital’ and ‘Student Engagement’—through which supportive environments impact ‘Achievement’. SDT posits that environments that satisfy basic psychological needs for autonomy, competence, and relatedness foster intrinsic motivation and optimal functioning. The present findings extend this framework by showing that such environments also build broader psychological resources (PsyCap) and foster multidimensional engagement (behavioral, cognitive, emotional).

Importantly, this study validates these SDT principles in a non-Western, collectivist cultural context. While much of the foundational SDT research was conducted in Western, individualistic cultures, the present findings demonstrate that the basic processes of need satisfaction and motivation operate similarly in the Indian educational context. The strong relationships between supportive classroom climates and both ‘Psychological Capital’ and engagement suggest that Indian students, like their Western counterparts, thrive in environments that provide autonomy support, structure, and relational warmth.

4.8.3 Extension of ‘Psychological Capital’ to Adolescent Educational Contexts

The study significantly contributes to the ‘Psychological Capital’ (PsyCap) literature by validating its importance in a non-Western, adolescent, educational sample. Much of the original PsyCap research was conducted with adults in organizational settings (Luthans et al., 2007). This study demonstrates that the core components of PsyCap—hope, efficacy, resilience, and optimism—are not only relevant but constitute a powerful predictor of academic

‘Achievement’ among Indian secondary students.

The finding that PsyCap is a significant mediator between environmental supports and ‘Achievement’ confirms that it functions as a key personal resource that translates environmental affordances into tangible outcomes. This extends the theoretical understanding of PsyCap from a relatively stable individual difference to a malleable state that can be cultivated through supportive environments. The substantial ‘correlations’ between both ‘Classroom Climate’ and ‘Parental Involvement’ with PsyCap suggest that these positive psychological resources develop in response to environmental conditions, supporting a developmental rather than purely trait-based conceptualization of PsyCap.

4.8.4 Clarification of ‘Student Engagement’ as the Dominant Proximal Mechanism

The study adds important nuance to the ‘Student Engagement’ literature. While confirming engagement’s role as a powerful predictor of ‘Achievement’ (Fredricks et al., 2004; Wang & Holcombe, 2010), the parallel mediation analyses make a subtler but critical contribution: they establish engagement as the dominant mediator relative to ‘Psychological Capital’. This finding has important theoretical implications.

It suggests that while internal beliefs and psychological resources (PsyCap) are important precursors, it is the active, behavioral, and cognitive enactment of these resources in the form of engagement that is the most critical proximal link to academic success. In other words, supportive environments and positive beliefs are necessary but not sufficient; they must be translated into active engagement with learning tasks for ‘Achievement’ to occur. This finding supports theoretical models that position engagement as the final common pathway to ‘Achievement’ (Skinner et al., 2009) and suggests that engagement may be the most proximal and therefore most powerful lever for improving academic outcomes.

The finding also helps to clarify the relationship between ‘Psychological Capital’ and engagement. The strong correlation between these constructs ($r = .585$) and the fact that both mediate environmental influences suggest that they are closely intertwined but distinct. PsyCap may be best understood as a set of psychological resources that enable and sustain engagement, while engagement represents the actualization of those resources in the learning context.

4.8.5 ‘Illumination of the Mechanisms of ‘Parental Involvement’

Finally, the ‘findings’ contribute to the ‘literature’ on ‘Parental Involvement’ by illuminating how it works. The relatively modest direct effect of “‘Parental Involvement’” on “‘Achievement’” ($\beta = .104$ in the ‘multiple regression’), coupled with the significant indirect effects through both PsyCap and engagement, supports the argument that the most effective ‘Parental Involvement’ is that which builds a child’s internal resources and fosters their own

active participation in school (Hill & Tyson, 2009; Pomerantz et al., 2007).

This finding challenges simplistic notions that ‘Parental Involvement’ directly causes ‘Achievement’ and instead suggests a more nuanced process. Parents influence ‘Achievement’ primarily by creating conditions that foster their children's hope, efficacy, resilience, optimism, and engagement. This has important implications for how ‘Parental Involvement’ is conceptualized and measured in research, and it suggests that interventions should focus on the quality and nature of involvement rather than simply its quantity.

4.9 Chapter Summary

This chapter presented a comprehensive analysis of data collected from 1,605 secondary school students across West Bengal, examining the relationships among classroom climate, ‘Parental Involvement’, ‘Psychological Capital’, ‘Student Engagement’, and English ‘Achievement’. The analysis progressed systematically through multiple levels of complexity, beginning with ‘Descriptive Statistics’ and culminating in sophisticated parallel mediation models.

Key findings included: (1) the absence of gender differences across all study variables, indicating gender equity in this sample; (2) small but significant ‘rural’-‘urban’ differences favoring ‘urban’ students in ‘Parental Involvement’ and ‘Achievement’; (3) significant positive inter’ correlations’ among all study variables, with the strongest relationships observed between proximal student-level factors; (4) the identification of ‘Student Engagement’ and ‘Psychological Capital’ as the strongest direct predictors of ‘Achievement’ in multiple ‘regression’; and (5) the confirmation through parallel mediation analyses that both ‘Classroom Climate’ and ‘Parental Involvement’ influence ‘Achievement’ primarily through indirect pathways, with ‘Student Engagement’ serving as the dominant mediating mechanism.

The analyses successfully addressed all seven research objectives and found support for seven of the eight hypotheses (with H1 receiving partial support). The convergence of evidence across multiple analytical approaches—from simple ‘correlations’ to complex mediation models—provides robust support for the theoretical framework guiding this study and offers a clear picture of the mechanisms through which environmental and personal factors combine to influence academic ‘Achievement’.

4.10 Chapter Conclusion

This chapter embarked on a ‘comprehensive analytical’ journey to unravel the complex interplay of factors influencing English ‘Achievement’ among secondary school students. Moving systematically from ‘Descriptive Statistics’ to advanced mediation modeling, the analysis has painted a clear and theoretically coherent picture. The findings unequivocally demonstrate that while supportive environments at home and in the classroom are critical, their

power is primarily actualized through their ability to build students' internal psychological resources and, most importantly, to foster their active engagement with learning.

‘The student, therefore, emerges not as a passive recipient of environmental influences but as an active agent whose ‘Psychological Capital’ and engagement are the ultimate keys to academic success.’ The environmental factors of ‘Classroom Climate’ and ‘Parental Involvement’ create the conditions for success, but it is the student's own internal resources and active participation that translate these conditions into ‘Achievement’. This understanding of the mechanisms of influence provides a solid empirical foundation for the theoretical discussion and practical recommendations that will be developed in the subsequent chapter of this thesis.

CHAPTER V: CONCLUSIONS, IMPLICATIONS, LIMITATIONS, AND SUGGESTIONS

CHAPTER V: CONCLUSIONS, IMPLICATIONS, LIMITATIONS, AND SUGGESTIONS

‘Education is not preparation for life; education is life itself. The process of education is not merely the transmission of knowledge, but the cultivation of the conditions under which individuals can flourish, engage deeply with learning, and develop the psychological resources necessary for sustained achievement.’ —John Dewey (1938)

5.1 Introduction

This chapter presents a comprehensive discussion and interpretation of the findings reported in Chapter IV, situating them within the broader theoretical and empirical landscape of ‘educational psychology’, ‘positive psychology’, and ‘student engagement research’. The primary purpose of this chapter is to move beyond the statistical presentation of results to explore their deeper meaning, theoretical significance, and practical implications for English language education in the Indian secondary school context. The discussion is organized to follow the logical progression of the analyses, beginning with foundational descriptive and group comparison findings and culminating in an integrated interpretation of the complex mediation mechanisms that link environmental and family factors to academic achievement.

The present study investigated the intricate relationships among ‘classroom climate’, ‘parental involvement’, ‘psychological capital’, ‘student engagement’, and ‘achievement in English’ among a large, representative sample of 1,605 secondary school students from West Bengal. Guided by an integrated theoretical framework drawing from ‘Social Cognitive Theory’ (Bandura, 2001), ‘Self-Determination Theory’ (Ryan & Deci, 2000), ‘Positive Psychology’ (Luthans et al., 2007), and ‘Engagement Theory’ (Fredricks et al., 2004), the research employed a systematic analytical progression from simple descriptive statistics to sophisticated parallel multiple mediation models. This methodological approach allowed for a nuanced understanding of not only whether relationships exist among the study variables, but more importantly, how and through what mechanisms environmental and family factors translate into academic outcomes.

The findings of this study make several important contributions to the literature. First, they provide empirical validation for an integrated ‘socio-ecological model’ of academic achievement that positions student-level psychological and behavioral factors as critical mediating mechanisms through which contextual influences operate. Second, they illuminate the relative importance of different pathways to achievement, establishing ‘student

engagement’ as the dominant proximal mechanism. Third, they document important patterns of equity and disparity in the West Bengal educational context, revealing complete gender parity alongside modest but significant rural-urban differences. Fourth, they extend theoretical frameworks developed primarily in Western contexts to the Indian educational setting, demonstrating both universality and cultural specificity in the processes underlying academic achievement.

5.2 Summary and Discussion of Findings

This section presents a structured summary of the empirical findings of the study, organized first by the research objectives and then by the corresponding hypotheses.

5.2.1 Objective -Wise Summary of Findings

Objective 1: To explore the nature of the classroom climate and the levels of parental involvement, psychological capital, and engagement among secondary students.

- **Finding:** A comprehensive descriptive analysis was conducted to address this objective. The findings revealed that students held generally positive perceptions of their classroom environments, with a mean score of 60.01 on the ‘Classroom Climate’ Scale, which falls into the ‘High’ category. ‘Parental involvement’ (Mean = 34.84), ‘psychological capital’ (Mean = 41.96), and ‘student engagement’ (Mean = 33.66) all demonstrated ‘Moderate’ mean scores. ‘Achievement in English’ also fell within the ‘Moderate’ range (Mean = 15.24 out of 30) but showed substantial variability (SD = 7.16), indicating a wide range of proficiency levels among students. All variables were found to be approximately normally distributed, satisfying the assumptions for subsequent parametric tests.

Objective 2: To identify differences in the study variables based on gender and the locale (urban/rural) of the school.

- **Finding:** A series of independent samples t-tests were conducted. The results indicated that there were **no statistically significant differences** between male and female students on any of the five study variables (‘classroom climate’, ‘parental involvement’, ‘psychological capital’, ‘student engagement’, or ‘Achievement in English’). In contrast, statistically significant differences were found based on school locale. Urban students reported significantly higher levels of ‘parental involvement’ ($p < .001$) and had significantly higher scores on ‘Achievement in English’ ($p = .002$) compared to their rural counterparts.

Objective 3: To determine the interrelationships among classroom climate, parental involvement, psychological capital, engagement, and achievement in English.

- **Finding:** Pearson correlation analysis revealed that all study variables were **significantly and positively correlated** with one another (all $p < .001$), with correlation coefficients ranging from moderate ($r = .252$) to strong ($r = .586$). Furthermore, multiple regression analysis demonstrated that ‘classroom climate’ and ‘parental involvement’ both had significant positive direct effects on ‘Achievement in English’ when controlling for other variables. ‘Student engagement’ emerged as the strongest predictor of ‘Achievement in English’ ($\beta = .327$), followed by ‘psychological capital’ ($\beta = .191$).

Objective 4: To investigate the mediating role of Psychological Capital in the relationship between parental involvement and English achievement.

- **Finding:** A mediation analysis using the jAMM Module of Jamovi confirmed that ‘psychological capital’ **did significantly mediate** the relationship between ‘parental involvement’ and ‘Achievement in English’. The indirect effect was statistically significant ($p < .001$), indicating that parental involvement fosters psychological capital, which in turn leads to higher English achievement.

Objective 5: To investigate the mediating role of Engagement in the relationship between parental involvement and English achievement.

- **Finding:** The mediation analysis confirmed that ‘student engagement’ **did significantly mediate** the relationship between ‘parental involvement’ and ‘Achievement in English’. The indirect effect was statistically significant ($p < .001$), demonstrating that parental involvement boosts student engagement, which subsequently improves English achievement.

Objective 6: To investigate the mediating role of Psychological Capital in the relationship between classroom climate and English achievement.

- **Finding:** The mediation analysis confirmed that ‘psychological capital’ **did significantly mediate** the relationship between ‘classroom climate’ and ‘Achievement in English’. The indirect effect was statistically significant ($p < .001$), indicating that a positive classroom climate enhances students’ psychological capital, which then positively impacts their English achievement.

Objective 7: To investigate the mediating role of Engagement in the relationship between classroom climate and English achievement.

- **Finding:** The mediation analysis confirmed that ‘student engagement’ **did significantly mediate** the relationship between ‘classroom climate’ and ‘Achievement in English’. This was the strongest mediation effect found in the study. The indirect effect was statistically significant ($p < .001$), highlighting that a positive classroom climate strongly promotes student engagement, which is a primary driver of higher achievement in English.

5.2.2 Hypothesis-Wise Summary of Findings

Hypothesis 1: There exists significant difference in perceived classroom climate, level of parental involvement, psychological capital, engagement, and academic achievement among secondary school students on the basis of gender and locale of school.

Result: This research hypothesis was **partially supported**.

1. With respect to **gender**, the hypothesis was **not supported**, as no statistically significant differences were found between male and female students in perceived classroom climate, parental involvement, psychological capital, student engagement, or Achievement in English.
2. With respect to **locale of school**, the hypothesis was **partially supported**, as statistically significant differences were found in **parental involvement** and **Achievement in English** between urban and rural students. However, no significant differences were observed in perceived classroom climate, psychological capital, and student engagement on the basis of locale.

Thus, Hypothesis 1 received partial empirical support.

Hypothesis 2: There exists significant relationship between classroom climate and psychological capital and engagement among secondary school students.

Result: This research hypothesis was **supported**. A significant and positive correlation was found between **classroom climate** and **psychological capital** ($r = .586, p < .001$), as well as between **classroom climate** and **student engagement** ($r = .548, p < .001$). These findings indicate that students who perceived a more supportive and positive classroom climate also tended to report higher psychological capital and greater engagement.

Hypothesis 3: There exists significant relationship between parental involvement and psychological capital and engagement among secondary school students.

Result: This research hypothesis was **supported**. A significant and positive correlation was found between **parental involvement** and **psychological capital** ($r = .432, p < .001$), as well as between **parental involvement** and **student engagement** ($r = .389, p < .001$). This suggests that higher perceived parental involvement was associated with stronger psychological resources and higher levels of engagement among secondary school students.

Hypothesis 4: There exists significant relationship of classroom climate, parental involvement, psychological capital, and engagement to academic achievement among secondary school students.

Result: This research hypothesis was **supported**. Classroom climate, parental involvement, psychological capital, and student engagement were all found to have significant positive relationships with **Achievement in English**. The results of correlation and regression analyses confirmed that these variables were meaningfully associated with students' English academic achievement.

Hypothesis 5: Psychological Capital mediates the relationship between parental involvement and English academic achievement of secondary school students.

Result: This research hypothesis was **supported**. The mediation analysis confirmed a significant indirect effect of **parental involvement** on **Achievement in English** through **psychological capital**. This indicates that parental involvement contributes to English achievement partly by strengthening students' psychological resources such as hope, efficacy, resilience, and optimism.

Hypothesis 6: Academic Engagement mediates the relationship between parental involvement and English achievement of secondary school students.

Result: This research hypothesis was **supported**. The mediation analysis confirmed a significant indirect effect of **parental involvement** on **Achievement in English** through **student engagement**. This finding suggests that parental involvement enhances English achievement partly by promoting students' cognitive, emotional, and behavioural engagement in learning.

Hypothesis 7: Psychological Capital mediates the relationship between classroom climate and English achievement of secondary school students.

Result: This research hypothesis was **supported**. The mediation analysis confirmed a significant indirect effect of **classroom climate** on **Achievement in English** through **psychological capital**. This implies that a positive classroom climate may improve English achievement partly by developing students' psychological capital.

Hypothesis 8: Academic Engagement mediates the relationship between classroom climate and English achievement of secondary school students.

Result: This research hypothesis was **supported**. The mediation analysis confirmed a significant indirect effect of **classroom climate** on **Achievement in English** through **student engagement**. This indicates that classroom climate influences English achievement partly by increasing students' active engagement in the learning process.

Overall, the hypothesis-wise findings reveal that the study's research hypotheses were largely supported. Hypothesis 1 was partially supported, while Hypotheses 2 to 8 were supported by the empirical results. The findings confirm that classroom climate and parental involvement are significantly associated with students' psychological capital, engagement, and English achievement, and that psychological capital and student engagement function as important mediating mechanisms in these relationships.

5.2.3 Descriptive Findings: Understanding the Landscape of Student Experiences

The first research objective sought to explore the type and level of 'classroom climate', 'parental involvement', 'psychological capital', 'student engagement', and 'achievement in English' among secondary school students. The descriptive analyses revealed a nuanced picture of student experiences that provides essential context for interpreting the subsequent inferential findings.

Variable Levels and Their Implications

A particularly important contribution of the descriptive analysis was the systematic categorization of students into 'low', 'moderate', and 'high' levels for each study variable. This approach moved beyond simple mean comparisons to provide a more substantive understanding of the distribution of experiences within the sample. The findings revealed several noteworthy patterns that have important theoretical and practical implications.

The most striking finding was that an overwhelming majority of students (86.9%) perceived their classroom climate as ‘highly positive’, with mean scores falling squarely in the high range of the scale. This suggests that secondary schools in West Bengal have been largely successful in creating supportive, well-structured, and respectful learning environments. From the perspective of ‘Self-Determination Theory’ (Ryan & Deci, 2000), this indicates that classrooms are generally providing adequate support for students’ basic psychological needs for ‘autonomy’, ‘competence’, and ‘relatedness’. This high baseline level of positive classroom climate is encouraging, as it provides a strong foundation for the other processes examined in this study. However, it also raises questions about whether there is sufficient variability in classroom climate to detect its full range of effects on student outcomes, a point that will be revisited in the limitations section.

In contrast to the uniformly positive perceptions of classroom climate, ‘parental involvement’ showed a more concerning pattern. The distribution was nearly evenly split between students reporting ‘low’ (48.1%) and ‘moderate’ (51.9%) levels of parental involvement, with critically, no students reporting ‘high’ levels. This finding aligns with research by Hill and Tyson (2009), who noted that parental involvement tends to decline during adolescence as students seek greater autonomy. However, the complete absence of students in the ‘high involvement’ category suggests that even among the most involved parents, there may be barriers to achieving the kind of deep, sustained engagement that characterizes optimal family support for learning.

This pattern may reflect several factors specific to the Indian context. First, many parents, particularly in rural areas, may have limited formal education themselves and may feel ill-equipped to support their children’s English language learning (Desimone, 1999). Second, the demands of work and household responsibilities may leave parents with limited time and energy for school involvement (Lareau, 2003). Third, cultural norms regarding the boundaries between home and school may lead parents to view education as primarily the responsibility of teachers and schools (Epstein, 2018). Whatever the underlying causes, the finding that parental involvement is ‘moderate’ at best for most students, and genuinely ‘high’ for none, suggests an important area for intervention and support.

‘Psychological capital’ and ‘student engagement’ both showed moderate mean levels, with the majority of students (66.4% for PsyCap, 64.6% for engagement) falling in the ‘moderate’ range. However, a substantial minority reported ‘low’ levels (31.5% for PsyCap, 20.3% for engagement). This distribution is theoretically meaningful. It suggests that while most students possess functional levels of ‘hope’, ‘efficacy’, ‘resilience’, and ‘optimism’, and are reasonably

engaged with their learning, there is considerable room for improvement. The presence of a sizable group with ‘low psychological capital’ and ‘low engagement’ is particularly concerning, as these are the students most at risk for academic difficulties and disengagement from school.

From the perspective of ‘Positive Psychology’, the finding that psychological capital is ‘moderate’ rather than ‘high’ for most students suggests that interventions aimed at building these positive psychological resources could have substantial impact (Luthans et al., 2007). Similarly, from an ‘engagement theory’ perspective (Fredricks et al., 2004), the finding that one in five student reports ‘low engagement’ indicates a critical need for teaching strategies and classroom practices that actively foster behavioral, cognitive, and emotional investment in learning.

Finally, ‘achievement in English’ showed substantial variability, with students distributed across the full range from very low to very high performance. The mean score of 15.24 out of 30 (approximately 51%) indicates that the average student is performing at a ‘moderate’ level, but with considerable spread around this mean. This variability is methodologically advantageous, as it provides sufficient variance to examine predictors of achievement, but it is also substantively concerning from an educational quality perspective. The fact that nearly one-third of students (31.8%) are in the ‘low-achieving’ category suggests that current instructional approaches are not meeting the needs of a substantial proportion of learners.

Sample Characteristics and Representativeness

The sample demonstrated excellent characteristics for the purposes of this study. The near-perfect gender balance (52.6% female, 47.4% male) and the representation of both rural (66.4%) and urban (33.6%) schools ensured that the findings are not biased toward one demographic group. The concentration of students in the 16-17-year age range is appropriate for the secondary school context and provides a relatively homogeneous developmental group, reducing age-related confounds. The complete absence of missing data across all study variables is a significant methodological strength, as it eliminates concerns about bias introduced through list wise deletion or imputation procedures and reflects high participant engagement and data quality.

The geographic distribution, with approximately two-thirds of the sample from rural schools, appropriately reflects the demographic reality of West Bengal and India more broadly, where the majority of the population resides in rural areas. This distribution ensures that the findings are not unduly influenced by the experiences of urban students, who often have access to greater resources and opportunities. At the same time, the inclusion of a substantial urban

subsample (540 students) provides sufficient statistical power to detect rural-urban differences and to test whether the theoretical model operates similarly across geographic contexts.

5.2.4 Group Differences: Patterns of Equity and Disparity

The second research objective examined differences in the study variables based on gender and school locale. The findings revealed a striking pattern: complete gender parity across all variables, but small yet significant rural-urban differences in parental involvement and achievement.

Gender Equity: A Positive Finding for Indian Education

The absence of statistically significant gender differences across all five study variables—‘classroom climate’, ‘parental involvement’, ‘psychological capital’, ‘student engagement’, and ‘achievement in English’—is one of the most important and encouraging findings of this study. This pattern held consistently across all measures, with effect sizes ranging from essentially zero to trivial ($d = -.049$ to $.011$), and was robust across both rural and urban contexts.

This finding stands in contrast to historical patterns of gender disparity in Indian education and to findings from some previous research that has documented gender gaps in achievement, engagement, or psychological variables (Sirin, 2005). The gender equity observed in this sample may reflect the success of several decades of policy initiatives aimed at promoting girls’ education in India, including programs to reduce barriers to school enrolment and completion, improve school infrastructure, and challenge gender stereotypes in educational settings (Ministry of Education, Government of India, 2020).

From a theoretical perspective, the absence of gender differences aligns with the ‘Gender Similarities Hypothesis’ proposed by Hyde (2014), which argues that males and females are similar on most psychological variables and that gender differences, where they exist, are typically small in magnitude. The present findings support this perspective and suggest that in the contemporary West Bengal secondary school context, gender is not a significant factor differentiating students’ experiences of their learning environments, their psychological resources, their engagement with learning, or their academic achievement in English.

This finding has important implications for educational practice and policy. It suggests that interventions and supports do not need to be differentially designed for male and female students, as both groups appear to be experiencing similar levels of environmental support and possess similar levels of internal resources. It also suggests that efforts to promote gender equity in education in West Bengal have been largely successful, at least in terms of the variables examined in this study. However, it is important to note that gender equity in these

domains does not necessarily imply equity in all aspects of educational experience, and continued vigilance is needed to ensure that gains are maintained and extended to other outcomes and contexts.

Rural-Urban Disparities: Modest but Meaningful Differences

In contrast to the pattern of gender equity, comparisons between rural and urban students revealed statistically significant differences in two of the five study variables: ‘parental involvement’ and ‘achievement in English’. Urban students reported higher levels of parental involvement ($M = 35.9$) compared to rural students ($M = 34.3$), $t(1603) = 2.52$, $p = .012$, $d = .186$. Similarly, urban students achieved higher scores on the English assessment ($M = 16.0$) compared to rural students ($M = 14.9$), $t(1603) = 3.11$, $p = .002$, $d = .164$.

While these differences are statistically significant, it is important to note that the effect sizes are ‘small’ by conventional standards (Cohen, 1988). The difference in parental involvement represents less than 5% of the scale range, and the difference in achievement represents less than 4% of the total possible score. Nevertheless, even small differences can compound over time and may have meaningful consequences for students’ future opportunities, particularly in a context where English proficiency is increasingly important for higher education and employment (Graddol, 2010).

The rural-urban difference in parental involvement may reflect several underlying factors. Urban parents are more likely to have higher levels of formal education themselves, which may enable them to provide more effective homework help and to engage more confidently with teachers and school personnel (Lareau, 2003). Urban parents may also have greater access to information about educational opportunities and strategies for supporting their children’s learning. Additionally, the nature of employment in urban versus rural contexts may afford urban parents more flexibility to attend school events and meetings, whereas rural parents engaged in agricultural work may face more demanding and inflexible schedules.

However, it is crucial to recognize that the parental involvement measure used in this study may not fully capture all forms of involvement that are valued and practiced in rural contexts. Research has shown that parental involvement can take many forms, and measures developed in Western urban contexts may not adequately capture the ways that rural and less-educated parents support their children’s education (Epstein, 2018). Rural parents may express their involvement through different mechanisms, such as emphasizing the value of education, making sacrifices to keep children in school, or providing emotional support, even if they are less able to provide direct academic assistance or school-based involvement. This measurement

issue underscores the need for culturally sensitive assessment tools that recognize diverse forms of family engagement.

The rural-urban difference in English achievement is consistent with a large body of research documenting rural-urban achievement gaps in India and globally (Hampden-Thompson & Johnston, 2006; ASER, 2019). Several mechanisms may explain this disparity. Urban students typically have greater exposure to English outside of school through media, signage, and social interactions, providing more opportunities for authentic language practice. Urban schools may have better access to English-language resources such as libraries, multimedia materials, and technology. Urban teachers may have higher levels of English proficiency themselves and may be more confident in using communicative teaching methods. Finally, the higher levels of parental involvement in urban contexts may translate into more support for English learning at home, including help with homework and access to supplementary resources like tutoring.

Importantly, no significant rural-urban differences were found for ‘classroom climate’, ‘psychological capital’, or ‘student engagement’. This suggests that rural and urban schools in West Bengal are providing comparable levels of environmental support and that rural students possess similar levels of psychological resources and are equally engaged with their learning as their urban counterparts. This is an encouraging finding and suggests that efforts to improve educational quality in rural areas have had some success in creating positive learning environments and fostering student motivation and engagement. The challenge, then, is to translate these comparable levels of environmental support, psychological resources, and engagement into comparable levels of achievement, which will require addressing the specific barriers to English language learning that rural students face.

5.2.5 Correlational and Regression Findings: Mapping the Network of Relationships

The third research objective was to examine the interrelationships among the study variables. The correlational analysis revealed a tightly interconnected network of relationships, providing strong support for the study’s integrated theoretical framework. All ten correlations among the five study variables were statistically significant ($p < .001$) and in the expected positive direction, with magnitudes ranging from moderate ($r = .252$) to strong ($r = .586$). The fact that 60% of the correlations were of large magnitude ($r \geq .50$) underscores the powerful and pervasive connections among students’ perceptions of their environment, their psychological resources, their active engagement, and their academic achievement.

The strongest correlation was observed between ‘student engagement’ and ‘psychological capital’ ($r = .586$), suggesting a powerful reciprocal relationship between these two constructs. Students who are hopeful, efficacious, resilient, and optimistic are more likely to engage deeply

with their learning, and this engagement, in turn, likely reinforces their psychological capital. This finding aligns with ‘Self-Determination Theory’, which posits that feelings of competence and autonomy (key components of psychological capital) are essential for fostering intrinsic motivation and engagement (Ryan & Deci, 2000).

‘Classroom climate’ also showed strong correlations with both ‘psychological capital’ ($r = .518$) and ‘student engagement’ ($r = .525$). This indicates that when students perceive their classrooms as supportive, respectful, and well-structured, they are more likely to develop positive psychological resources and to become more actively involved in their learning. This finding provides strong support for the central tenets of ‘Social Cognitive Theory’, which emphasizes the powerful role of the environment in shaping personal factors and behavior (Bandura, 2001).

‘Parental involvement’ was significantly correlated with all other variables, though the magnitudes were more moderate. Its strongest relationship was with ‘psychological capital’ ($r = .489$), suggesting that parental support is a key factor in building students’ hope, efficacy, resilience, and optimism. The correlation between ‘parental involvement’ and ‘student engagement’ ($r = .420$) was also substantial, indicating that when parents are involved, students are more likely to be engaged in their schoolwork.

Finally, ‘achievement in English’ was significantly correlated with all four predictor variables. The strongest predictor of achievement was ‘student engagement’ ($r = .520$), followed by ‘psychological capital’ ($r = .458$), ‘classroom climate’ ($r = .389$), and ‘parental involvement’ ($r = .352$). This rank ordering is theoretically meaningful and provides a preliminary indication of the relative importance of each factor. The finding that ‘student engagement’ is the strongest correlate of achievement aligns with a large body of research establishing engagement as a proximal and powerful predictor of academic success (Fredricks et al., 2004). It suggests that what students do—how they behave, feel, and think in the context of learning—is more directly related to their achievement than their perceptions of the environment or even their internal psychological resources.

5.2.6 Mediation Findings: Illuminating the Mechanisms of Influence

The final and most complex research objective was to investigate the mediating roles of ‘psychological capital’ and ‘student engagement’ in the relationships between the contextual factors (‘classroom climate’ and ‘parental involvement’) and ‘achievement in English’. The parallel multiple mediation analyses, conducted using jAMM module of Jamovi, provided a nuanced and powerful explanation of the mechanisms through which environmental and family support translate into academic outcomes. The findings revealed that both direct and indirect

pathways are important, but that the indirect effects, particularly those operating through ‘student engagement’, are dominant.

The Mediating Role of Psychological Capital and Student Engagement in the Classroom Climate-Achievement Relationship

The first mediation model examined how ‘classroom climate’ influences ‘achievement in English’ through the mediating mechanisms of ‘psychological capital’ and ‘student engagement’. The results revealed a complex interplay of direct and indirect effects.

First, a significant direct effect of ‘classroom climate’ on ‘achievement’ remained even after accounting for the mediators ($\beta = .069$, $p = .007$). This indicates that a positive classroom climate has a small but direct beneficial impact on English achievement, independent of its effects on students’ psychological resources or engagement. This direct effect may operate through mechanisms not measured in this study, such as the quality of instruction, the clarity of communication, or the availability of learning resources that are more prevalent in positive classroom climates.

However, the vast majority of the effect of ‘classroom climate’ on ‘achievement’ was indirect, operating through the two mediators. The total indirect effect was substantial ($\beta = .239$), accounting for 77.6% of the total effect of classroom climate. This is a critical finding, as it demonstrates that the primary way a positive classroom climate enhances achievement is by building students’ internal resources and fostering their active engagement.

Both ‘psychological capital’ and ‘student engagement’ were significant mediators. A positive ‘classroom climate’ predicted higher ‘psychological capital’ ($\beta = .518$), which in turn predicted higher ‘achievement’ ($\beta = .155$). The indirect effect through psychological capital was significant and meaningful ($\beta = .080$). This suggests that supportive classrooms function as incubators for students’ hope, efficacy, resilience, and optimism, and it is these psychological strengths that then enable students to achieve at higher levels.

Even more powerfully, a positive ‘classroom climate’ predicted higher ‘student engagement’ ($\beta = .307$), which in turn predicted higher ‘achievement’ ($\beta = .518$). The indirect effect through student engagement was more than double the size of the effect through psychological capital ($\beta = .159$). This establishes ‘student engagement’ as the primary mechanism through which classroom climate influences achievement. A good classroom gets students to try harder, to invest themselves emotionally in learning, and to think more deeply about the material, and it is this active engagement that most directly drives academic success.

The Mediating Role of Psychological Capital and Student Engagement in the Parental Involvement-Achievement Relationship

The second mediation model examined the pathways from ‘parental involvement’ to ‘achievement’. Similar to the classroom climate model, this analysis revealed a combination of direct and indirect effects, with the indirect effects being dominant.

‘Parental involvement’ had a significant direct effect on ‘achievement’ ($\beta = .105$, $p < .001$), which was larger than the direct effect of classroom climate. This suggests that parental involvement has a direct, unmediated impact on English achievement. This may occur through mechanisms such as direct homework help, provision of learning resources like books or tutoring, or the communication of high expectations for academic performance.

Despite this significant direct effect, the majority of the influence of ‘parental involvement’ on ‘achievement’ was indirect. The total indirect effect was substantial ($\beta = .131$), accounting for 55.5% of the total effect. This indicates that more than half of the benefit of parental involvement comes from its positive impact on students’ psychological and behavioral functioning.

Again, both ‘psychological capital’ and ‘student engagement’ were significant mediators. ‘Parental involvement’ predicted higher ‘psychological capital’ ($\beta = .489$), which in turn predicted higher ‘achievement’ ($\beta = .110$). The indirect effect through psychological capital was significant ($\beta = .054$). This suggests that when parents are involved, they build their children’s confidence, hope, and resilience, and these psychological assets then translate into better academic performance.

‘Parental involvement’ also predicted higher ‘student engagement’ ($\beta = .208$), which in turn predicted higher ‘achievement’ ($\beta = .370$). The indirect effect through student engagement was also significant ($\beta = .077$) and larger than the effect through psychological capital. This indicates that a key way parental involvement works is by encouraging and supporting students to be more engaged in their schoolwork. Involved parents may monitor homework, praise effort, and communicate the value of education, all of which can foster greater student engagement.

Integrated Interpretation of Mediation Findings

Taken together, the mediation findings provide a clear and compelling picture of the process of academic achievement. ‘Student engagement’ emerges as the most powerful and proximal predictor of ‘achievement in English’. It is the primary mechanism through which both ‘classroom climate’ and ‘parental involvement’ exert their influence. While ‘psychological capital’ is also a significant mediator, its role is secondary to that of engagement. This suggests a causal chain in which supportive environments (classroom) and families (parental involvement) build students’ psychological resources (psychological capital), which in turn,

along with the direct influence of the environment, fosters active ‘student engagement’. It is this engagement that ultimately drives learning and achievement. This model provides strong support for the importance of focusing educational interventions on the promotion of student engagement, as this is the ‘final common pathway’ to academic success.

5.2.7 CONCLUSIONS

Theoretical Contributions to English Language Education

This study successfully integrated ‘Social Cognitive Theory’, ‘Positive Psychology’, ‘Engagement Theory’, and ‘Family Systems Theory’ within the English language learning context, demonstrating the interconnected nature of environmental, family, psychological, and behavioral factors affecting ‘Achievement in English’. The research provided empirical validation for a comprehensive theoretical model, establishing a robust foundation for understanding the complexity of language learning processes.

The investigation explicated specific mediation mechanisms through which ‘classroom climate’ and ‘parental involvement’ influence ‘Achievement in English’. ‘Psychological capital’ and ‘student engagement’ were confirmed as key mediating mechanisms with significant indirect effects, establishing that environmental and family factors operate primarily through psychological and behavioral pathways rather than through direct influence alone. This finding advances theoretical understanding by demonstrating how external factors translate into academic outcomes through internal student processes.

The significance of partial mediation was established through the demonstration of multiple pathways to English achievement involving both direct and indirect effects. This confirms the complexity of educational processes and validates the theoretical prediction that ‘Achievement in English’ results from multiple simultaneous influences, requiring comprehensive intervention approaches that address various contributing factors.

Student-centered factors emerged as priority influences, with ‘student engagement’ ($\beta = .327$) and ‘psychological capital’ ($\beta = .191$) established as the strongest predictors of ‘Achievement in English’. This demonstrates that individual student characteristics are more influential than environmental factors for language learning outcomes, confirming the importance of focusing interventions on student psychological and behavioral development rather than solely on external conditions.

The study advanced mediation theory by providing robust empirical evidence for mediation processes in educational settings with bootstrap validation. Differential mediation patterns were demonstrated, with ‘classroom climate’ showing a larger mediated effect than ‘parental

involvement', contributing to a theoretical understanding of how various external factors differ in their pathways to academic outcomes.

Practical Significance for English Language Education

The importance of 'classroom climate' for English achievement was confirmed, with findings indicating that positive learning environments are crucial for language learning outcomes, operating primarily through the enhancement of 'student engagement'. This establishes that teachers must prioritize creating supportive, encouraging classroom atmospheres to maximize language learning outcomes, and that environmental interventions are most effective when combined with engagement-building strategies.

Family engagement value was established as remaining important for English language learning across secondary school years. The research demonstrated that family influence operates through both psychological resource building and behavioral engagement promotion, indicating that schools must maintain strong family partnerships to optimize student 'Achievement in English'. This finding challenges assumptions that family influence diminishes during adolescence and supports continued investment in family engagement programs.

'Student engagement' emerged as the strongest mediator and most important target for intervention, establishing that engagement-focused teaching strategies should be the primary emphasis in English language instruction. The findings demonstrate that both 'classroom climate' and 'parental involvement' achieve maximum impact through the enhancement of 'student engagement', providing clear guidance for educational practice and intervention design.

The essential nature of 'psychological capital' development was demonstrated through the significant contributions of hope, efficacy, resilience, and optimism to 'Achievement in English'. This indicates that positive psychology interventions should be integrated into English language education programs and that student psychological well-being directly impacts language learning success, expanding the scope of factors that educators must consider.

The validation of a multiple pathway approach establishes that comprehensive interventions addressing environmental, family, psychological, and behavioral factors simultaneously are most effective. Single-factor interventions are likely to have limited impact compared to integrated approaches, and educational programs must recognize and address the complexity of factors influencing 'Achievement in English' to achieve optimal outcomes.

Methodological Contributions

This research demonstrated the successful application of advanced statistical techniques to English language learning research, providing a model for future studies examining complex relationships in educational settings. The study developed a methodological framework for mediation analysis within language education research, thereby contributing to the advancement of research methods in the field.

The theoretical relationships were validated with a substantial sample size ($N = 1,605$), which provided excellent statistical power and demonstrated the robustness of findings across diverse demographic groups and educational contexts. This ‘large-scale validation’ establishes a reliable foundation for practical applications and policy recommendations, thereby enhancing confidence in the generalizability of results.

Rigorous bootstrap procedures employing 5,000 resamples were implemented to validate mediation effects, thereby establishing confidence in indirect effect estimates through advanced statistical validation. This methodological innovation establishes a standard for future mediation research in educational psychology and illustrates the importance of robust statistical validation in educational research.

Educational Policy Implications

Educational policies should incorporate the ‘multiple pathway understanding’ of ‘Achievement in English’, necessitating the integration of environmental, family, psychological, and behavioral factors for effective policy development. A long-term perspective on English language education is critical, acknowledging the complexity of influencing factors and the necessity for sustained, comprehensive approaches to language learning improvement.

Resource allocation should prioritize ‘student engagement’ and ‘psychological capital’ development programs, with investment in teacher training for engagement-enhancing strategies and positive psychology applications. Support for comprehensive family involvement initiatives alongside classroom-based interventions is essential for maximizing the effectiveness of educational investments and achieving optimal outcomes for English language learners.

Success measures should expand to include process variables such as ‘engagement’ and ‘psychological capital’ alongside outcome measures. School effectiveness evaluation should incorporate family involvement and classroom climate assessments, and ‘Achievement in English’ monitoring should consider multiple contributing factors for a comprehensive evaluation of educational quality and effectiveness.

Significance for Educational Practice

Teacher education programs must include training in mediation theory and multiple pathway approaches, with preparation emphasizing both direct instruction and indirect influence strategies. An understanding of psychological and behavioral factors is essential for effective English language teaching, requiring the reform of teacher preparation programs to address the complexity of factors affecting student achievement.

Educational interventions should target multiple pathways simultaneously for maximum effectiveness, addressing both environmental factors and individual student characteristics. Engagement enhancement should be the central focus of all ‘Achievement in English’ improvement efforts, with programs designed to recognize and address the interconnected nature of factors affecting language learning success.

Innovation in assessment and monitoring should include the regular assessment of mediating variables such as ‘engagement’ and ‘psychological capital’ alongside achievement outcomes. The monitoring of ‘classroom climate’ and ‘family involvement’ as predictors of future ‘Achievement in English’ is essential, along with data-driven decision making that incorporates multiple factors affecting language learning success for comprehensive educational improvement.

5.3 RECOMMENDATIONS

Based on the findings of the present research, the following recommendations are proposed for improving ‘Achievement in English’ through enhanced ‘classroom climate’, ‘parental involvement’, ‘psychological capital’, and ‘student engagement’.

5.3.1 General Recommendations

- **Prioritize Student Engagement Enhancement:** The primary focus of English language instruction should be on enhancing student engagement. Teachers should implement ‘interactive teaching methods’, ‘project-based learning approaches’, and create multiple opportunities for students to participate actively in English learning activities.
- **Cultivate a Positive Classroom Climate:** Develop supportive ‘teacher-student relationships’, establish clear expectations and routines, and foster ‘emotionally safe learning environments’ where students feel comfortable taking risks in English language use.

- **Develop Psychological Capital:** Implement ‘hope-building activities’, enhance student ‘self-efficacy’ through scaffolded learning experiences, build ‘resilience’ through supportive feedback, and promote ‘optimism’ about English language learning success.
- **Establish Comprehensive Family Engagement Programs:** Provide parents with specific strategies for supporting English learning at home, create meaningful opportunities for family participation in school-based English programs, and maintain regular communication between families and teachers.
- **Implement Integrated Intervention Approaches:** Address multiple pathways simultaneously, combining environmental improvements with individual student development, and monitoring both ‘process variables’ (engagement, psychological capital) and ‘outcome variables’ (Achievement in English).
- **Provide Professional Development:** Offer programs for teachers focusing on ‘engagement-enhancing strategies’, ‘positive psychology applications’ in education, ‘classroom climate improvement techniques’, and effective ‘family collaboration methods’.
- **Create Supportive Home Learning Environments:** Educate parents about the importance of psychological support, encourage family involvement in English learning activities, and provide resources for parents to support their children’s English language development.
- **Establish Regular Assessment and Monitoring:** Implement systems for tracking ‘engagement levels’, ‘psychological capital development’, ‘classroom climate quality’, and ‘family involvement effectiveness’ to ensure interventions are producing desired outcomes.
- **Develop School-Wide Policies:** Support positive classroom climates, encourage family engagement, promote student psychological well-being, and prioritize ‘engagement-focused teaching practices’ across all English language classes.
- **Implement Teacher Training Programs:** Include ‘mediation theory understanding’, ‘multiple pathway approaches’ to student achievement, skills in both ‘direct instruction’ and ‘indirect influence strategies’, and assessment of psychological and behavioural factors.

In the interest of translating the study's findings into specific, actionable recommendations for practitioners and policymakers, the following targeted interventions are proposed.

For classroom teachers:

- (1) Implement structured 'Classroom Climate Enhancement Protocols' that include weekly reflective feedback sessions, peer-learning circles, and teacher-student dialogue forums specifically designed to strengthen the emotional and intellectual dimensions of the classroom environment;
- (2) Integrate Psychological Capital-building activities—such as goal-setting exercises, resilience narratives, and self-efficacy affirmations—into the English language curriculum as a dedicated 15-minute weekly component;
- (3) Employ differentiated engagement strategies—including project-based learning, collaborative storytelling, and vocabulary-building games—to activate cognitive, emotional, and behavioural engagement with English language content.

For school administrators:

- (4) Establish structured Parent-Teacher Partnership Programmes that include monthly parent orientation sessions on home-based English learning support, bilingual communication guides for parents with limited English proficiency, and digital platforms for regular home-school communication; rural schools should receive priority resourcing given the significant urban-rural parental involvement gap identified in this study ($d = .19$);
- (5) Develop teacher professional development modules focused on positive classroom climate creation and student engagement facilitation, delivered as part of the annual in-service training calendar.

For policymakers:

- (6) Incorporate Psychological Capital assessment as a component of the annual school health and wellbeing survey conducted by the West Bengal State Council of Educational Research and Training (WBSCERT), enabling early identification of students at risk of low psychological resource levels;
- (7) Develop state-level guidelines for parental involvement in secondary schools that go beyond parent-teacher meetings to include structured home-school learning partnerships, particularly for first-generation educated families in rural and semi-urban areas.

5.3.2 Findings-Wise Recommendations

This section presents targeted recommendations directly derived from the specific findings of the study, ensuring that each empirical result translates into actionable guidance for educational practice and policy.

- **Finding 1: Student Engagement as the Strongest Predictor of English Achievement**
 - *Key Finding:* ‘Student engagement’ emerged as the strongest direct predictor of ‘Achievement in English’ ($\beta = .327, p < .001$) and demonstrated the most powerful mediating effects for both ‘classroom climate’ ($\beta = .159$) and ‘parental involvement’ ($\beta = .077$).
 - *Recommendations:*
 - Prioritize ‘engagement-focused pedagogy’: Teachers should implement interactive teaching methods, project-based learning, collaborative group work, and authentic communication tasks that maximize active student participation.
 - Monitor ‘engagement levels’ systematically: Schools should establish regular assessment systems to track behavioral, emotional, and cognitive engagement, using these data to identify students requiring additional support.
 - Allocate resources strategically: Given engagement’s central role, administrators should prioritize funding for engagement-focused professional development, instructional materials, and classroom technologies.
- **Finding 2: Classroom Climate Operates Primarily Through Indirect Pathways**
 - *Key Finding:* ‘Classroom climate’s’ influence on ‘Achievement in English’ is predominantly mediated (72.9% of total effect) through ‘psychological capital’ and ‘student engagement’.
 - *Recommendations:*
 - Focus on ‘process-oriented climate improvements’: Teachers should concentrate on creating supportive environments that foster engagement and psychological capital.

- Build ‘emotionally safe learning spaces’: Establish classroom norms that encourage risk-taking in English language use and provide supportive feedback.
 - Implement ‘comprehensive climate interventions’: Address multiple dimensions of classroom climate simultaneously—physical, social, emotional, and intellectual.
- **Finding 3: Parental Involvement Shows Balanced Direct and Indirect Effects**
 - *Key Finding:* ‘Parental involvement’ influences ‘Achievement in English’ through both direct (44.5%) and indirect pathways (55.5%).
 - *Recommendations:*
 - Develop ‘dual-focus family engagement programs’: Design initiatives that both directly support English learning and indirectly enhance achievement by building students’ psychological resources.
 - Educate parents about ‘process support’: Train families on how to foster hope, efficacy, resilience, and optimism in their children.
 - Create ‘multiple entry points for involvement’: Offer diverse opportunities for parental participation that accommodate varying family circumstances.
 - **Finding 4: Psychological Capital as a Significant Mediator**
 - *Key Finding:* ‘Psychological capital’ significantly mediated the effects of both ‘classroom climate’ ($\beta = .080$) and ‘parental involvement’ ($\beta = .054$) on ‘Achievement in English’.
 - *Recommendations:*
 - Integrate ‘positive psychology’ into curriculum: Implement explicit instruction in hope-building, self-efficacy enhancement, resilience development, and optimism cultivation.
 - Provide ‘scaffolded learning experiences’: Design tasks with appropriate challenge levels and clear success criteria to build confidence.
 - Train teachers in ‘psychological capital development’: Offer professional development on fostering these student attributes.

- **Finding 5: Urban-Rural Disparities in Parental Involvement and Achievement**
 - *Key Finding:* Significant differences were found in ‘parental involvement’ ($p < .001$) and ‘Achievement in English’ ($p = .002$), with urban students scoring higher.
 - *Recommendations:*
 - Develop targeted ‘rural support programs’: Implement specialized family engagement initiatives in rural areas to address unique challenges.
 - Leverage technology to ‘bridge gaps’: Utilize digital platforms to provide rural families with access to resources and communication channels.
 - Provide ‘additional resources’ to rural schools: Allocate supplementary funding to compensate for disparities.
- **Finding 6: Gender Equivalence Across All Study Variables**
 - *Key Finding:* No significant gender differences were found across any study variables (all $p > .05$).
 - *Recommendations:*
 - Maintain ‘gender-equitable practices’: Continue implementing strategies that have proven effective for both male and female students.
 - Avoid ‘gender-based differentiation’: Do not create separate interventions based on gender, as evidence suggests similar responses.
 - Focus resources on ‘location-based disparities’: Prioritize interventions targeting the observed urban-rural achievement gap.
- **Finding 7: Strong Interconnections Among All Study Variables**
 - *Key Finding:* All correlations among study variables were statistically significant ($p < .001$, $r = .252$ to $.586$), confirming an interconnected theoretical framework.
 - *Recommendations:*
 - Implement ‘integrated, multi-component interventions’: Design comprehensive programs that address multiple factors simultaneously.

- Avoid ‘single-factor intervention approaches’: These may be less effective than comprehensive approaches.
- Monitor ‘multiple pathways’: Establish assessment systems to track changes across all key variables to understand how interventions produce their effects.

5.4 Theoretical Contributions

The findings of this study make several significant contributions to the theoretical understanding of academic achievement, particularly within the context of English language education in India. By integrating multiple theoretical frameworks and employing a sophisticated analytical approach, the research moves beyond simply identifying correlates of achievement to illuminating the complex mechanisms through which environmental and family factors translate into academic success. The primary theoretical contributions lie in the empirical validation of an integrated ‘socio-ecological model’, the extension of established Western theories to a non-Western context, and the clarification of the central role of ‘student engagement’ as a final common pathway to achievement.

5.4.1 Validation of an Integrated Socio-Ecological Model

A central contribution of this study is the successful validation of an integrated theoretical model that synthesizes principles from ‘Social Cognitive Theory’, ‘Self-Determination Theory’, ‘Positive Psychology’, and ‘Engagement Theory’. The findings provide strong empirical support for a ‘socio-ecological perspective’ on achievement, which posits that student outcomes are a product of the dynamic interplay between distal environmental factors and proximal student-level factors. The consistent pattern of relationships observed—from ‘classroom climate’ and ‘parental involvement’ to ‘psychological capital’ and ‘student engagement’, and finally to ‘achievement’—confirms the core tenets of Albert Bandura’s (2001) ‘Social Cognitive Theory’. The results empirically demonstrate the principle of ‘reciprocal determinism’, showing how the environment (classroom and family), the person (‘psychological capital’), and behavior (‘student engagement’) are intricately linked and mutually influential in shaping academic outcomes. This study provides a clear, data-driven map of these interconnections within the specific context of Indian secondary education.

5.4.2 Extension and Validation of Self-Determination Theory

The research makes a notable contribution by testing and validating the core principles of ‘Self-Determination Theory’, a framework developed primarily in Western, individualistic cultures, within the Indian educational context. The strong positive relationships found between students’ perceptions of ‘classroom climate’ and their levels of both ‘psychological capital’

and ‘student engagement’ lend robust support to the theory’s central proposition: that social environments that support individuals’ basic psychological needs for ‘autonomy’, ‘competence’, and ‘relatedness’ will foster greater intrinsic motivation, well-being, and optimal functioning (Ryan & Deci, 2000). The finding that supportive, well-structured, and respectful classroom climates are associated with students who are more hopeful, confident, resilient, and actively engaged in their learning demonstrates the cross-cultural applicability of ‘Self-Determination Theory’s’ principles. This is a significant finding, as it suggests that the fundamental human need for supportive environments that foster self-determination transcends cultural boundaries and is as relevant for students in West Bengal as it is for students in North America or Europe.

5.4.3 Advancing the Understanding of Psychological Capital in Education

This study significantly extends the theoretical understanding and application of ‘Psychological Capital’. Originally developed in the field of organizational behavior, the concept of ‘Psychological Capital’ as a higher-order construct comprising ‘hope’, ‘efficacy’, ‘resilience’, and ‘optimism’ has been shown to be a powerful predictor of workplace performance (Luthans et al., 2007). The present research is among the first large-scale studies to systematically apply this construct to the adolescent educational context in India. The findings confirm that ‘Psychological Capital’ is a meaningful and important construct for understanding student achievement. The strong correlations between ‘Psychological Capital’ and both ‘student engagement’ and ‘achievement’, as well as its significant role as a mediator, establish it as a critical personal resource that fuels academic success. This contribution moves the field of educational psychology beyond the study of single positive psychological traits to a more holistic understanding of a core constellation of resources that can be developed and leveraged to promote student flourishing. The study validates ‘Psychological Capital’ as a key personal factor within the ‘Social Cognitive Theory’ framework, representing a potent set of agentic beliefs that enable students to navigate the challenges of their academic lives.

5.4.4 Clarifying the Mechanisms of Parental Involvement

The findings of this study contribute to a more nuanced theoretical understanding of how ‘parental involvement’ influences academic achievement during adolescence. Much of the literature has focused on whether parental involvement matters, with mixed results. This study moves the conversation forward by illuminating the mechanisms through which it operates. The parallel mediation analysis demonstrated that parental involvement influences achievement not primarily through direct assistance, but by fostering students’ internal resources (‘Psychological Capital’) and their active participation in learning (‘Student

Engagement’). This aligns with more sophisticated theoretical models of parental involvement, such as those proposed by Eva Pomerantz and her colleagues (2007) and Nancy Hill and Diana Tyson (2009), which argue that the most effective forms of involvement are those that build students’ own capacity for self-regulated learning. By showing that parental involvement predicts higher levels of hope, efficacy, resilience, optimism, and active engagement, this study clarifies the psychological and behavioral pathways through which family support translates into academic success. This is a critical theoretical contribution, as it helps to explain why some forms of parental involvement are more effective than others and provides a clear target for family-school partnership programs.

5.4.5 Establishing Student Engagement as a Final Common Pathway

Perhaps the most significant theoretical contribution of this study is the powerful empirical evidence it provides for the role of ‘student engagement’ as the ‘final common pathway’ to academic achievement (Skinner et al., 2009). Across both mediation models—for ‘classroom climate’ and ‘parental involvement’—student engagement consistently emerged as the stronger and more dominant mediating mechanism. This finding suggests that while supportive environments and positive psychological resources are crucial, their ultimate impact on achievement is realized through their effect on students’ active, moment-to-moment engagement with learning tasks. It is not enough for students to be in a good classroom or to feel hopeful and confident; they must translate these supports and resources into active participation, sustained effort, and cognitive investment for learning to occur.

This finding provides a powerful organizing principle for the integrated theoretical model. It positions ‘student engagement’ as the most proximal and critical determinant of achievement, serving as the primary mechanism through which more distal environmental, family, and psychological factors exert their influence. This clarifies the causal chain and underscores the theoretical centrality of engagement in any model of academic achievement. By demonstrating this empirically in a large-scale study, the research provides robust validation for ‘engagement theory’ (Fredricks et al., 2004) and integrates it seamlessly with ‘Social Cognitive Theory’, ‘Self-Determination Theory’, and ‘Positive Psychology’, showing how these frameworks converge on the importance of active student participation in the learning process.

It is important to clarify that while the present study examined the roles of Classroom Climate, Parental Involvement, Psychological Capital, and Student Engagement specifically in relation to Achievement in English, the theoretical mechanisms identified are not inherently subject-specific. The positive associations between supportive classroom environments, parental engagement, psychological resources, and academic achievement are consistent with general

theories of academic motivation and learning (Bandura, 1986; Deci & Ryan, 2000; Fredricks et al., 2004) that are not restricted to any particular subject domain. The present study's focus on English achievement was motivated by the specific contextual challenges of English language learning in West Bengal, where English functions as a compulsory second language with distinct socio-linguistic and motivational dynamics; however, the underlying mechanisms—whereby environmental antecedents foster internal psychological resources and behavioural engagement that in turn facilitate academic performance—are theoretically expected to operate across subject domains. Future studies are therefore encouraged to examine whether the mediational framework validated in the present investigation replicates in the context of other subjects—such as Mathematics, Science, or Bengali—within the same educational context, which would further establish the generalisability of the theoretical model and its practical implications for subject-specific pedagogy.

5.5 Implications of the Study

The findings of this research have far-reaching and multifaceted implications that extend across theoretical, methodological, educational, and policy domains. The practical significance of the statistical findings of this study for classroom practitioners, school administrators, and educational policymakers merits explicit elaboration. The finding that Classroom Climate demonstrates a statistically significant positive association with Achievement in English ($r = .52, p < .001$) translates into a concrete practical implication: teachers who invest in creating emotionally supportive, intellectually stimulating, and socially cohesive classroom environments are likely to observe measurable improvements in their students' English language performance. Practices such as providing constructive and encouraging feedback, fostering peer collaboration, maintaining consistent academic expectations, and demonstrating genuine interest in students' learning progress are likely to enhance the classroom climate dimensions that most strongly associate with achievement. The finding that Parental Involvement associates positively with Achievement in English ($r = .48, p < .001$) suggests that school-based programmes designed to enhance parental engagement—such as structured parent-teacher communication protocols, home-based learning support workshops, and school-family partnership initiatives—are likely to yield academic benefits for students. The mediation findings carry particularly important practical implications: the significant mediating roles of Psychological Capital and Student Engagement indicate that interventions targeting students' internal psychological resources and behavioural engagement are likely to amplify the positive effects of supportive classroom environments and parental involvement on English

achievement. Practically, this suggests that schools should invest not only in improving the quality of the instructional environment but also in building students' psychological resilience, self-efficacy, hope, and optimism through targeted positive psychology interventions, and in fostering deep, multidimensional engagement with English language learning tasks.

The following section provides an elaborate discussion of these implications, organized to reflect the breadth and depth of the study's contributions. The implications are presented in a manner that connects the empirical findings to actionable insights for researchers, educators, administrators, policymakers, and other stakeholders invested in improving educational outcomes for secondary school students in India and beyond.

5.5.1 Theoretical Implications

Advancing Integrated Models of Academic Achievement

The successful validation of an integrated socio-ecological model in this study has significant theoretical implications for how researchers conceptualize and study academic achievement. The findings demonstrate that achievement is not the product of any single factor, but rather emerges from the complex interplay of environmental contexts (classroom and family), personal psychological resources ('Psychological Capital'), and behavioral engagement. This challenges reductionist approaches that focus on isolated variables and supports the development of more comprehensive, systems-oriented theories. Future theoretical work should continue to build on this integrated perspective, exploring how additional factors—such as peer relationships, school organizational climate, cultural values, and broader societal influences—fit into the model. The study provides a strong empirical foundation for theories that position student-level mediating variables as the critical mechanisms through which distal contextual factors influence outcomes.

Cross-Cultural Validation of Western Theories

The finding that 'Self-Determination Theory', originally developed and tested primarily in Western contexts, applies robustly to Indian secondary school students has important implications for the 'universality versus cultural specificity' debate in educational psychology. The results suggest that the basic psychological needs for 'autonomy', 'competence', and 'relatedness' are indeed fundamental human needs that transcend cultural boundaries. However, this does not mean that culture is irrelevant. Future theoretical work should explore how these universal needs are expressed, supported, and satisfied in culturally specific ways. For example, the meaning of 'autonomy' in a collectivist culture like India may differ from its meaning in individualist Western cultures, yet the underlying need for a sense of volition and self-direction remains important. This study opens the door for more nuanced, culturally

informed applications of ‘Self-Determination Theory’ and other Western-origin frameworks in non-Western educational settings.

Positioning Psychological Capital as a Core Educational Construct

By demonstrating the critical role of ‘Psychological Capital’ in mediating the effects of environmental factors on achievement, this study elevates ‘Psychological Capital’ from a peripheral concept borrowed from organizational psychology to a central construct in educational theory. The findings suggest that ‘hope’, ‘efficacy’, ‘resilience’, and ‘optimism’ are not merely ‘nice to have’ attributes, but are fundamental psychological resources that enable students to translate environmental supports into active engagement and, ultimately, achievement. This has implications for how educational psychologists conceptualize student development and well-being. Future theoretical models of academic motivation, engagement, and achievement should incorporate ‘Psychological Capital’ as a key personal resource variable, alongside more traditional constructs like ‘self-concept’, ‘self-efficacy’, and ‘goal orientation’.

5.5.2 Methodological Implications

The Value of Parallel Mediation Models

From a methodological standpoint, this study demonstrates the value of ‘parallel mediation analysis’ for understanding complex educational phenomena. By testing ‘Psychological Capital’ and ‘Student Engagement’ as simultaneous mediators, the research was able to compare their relative contributions and establish that engagement is the more dominant pathway. This approach provides a more complete and nuanced picture than would be obtained from testing each mediator separately or from simply examining direct effects. Future research on educational processes should consider employing parallel mediation models whenever theoretical considerations suggest that multiple mechanisms may be operating simultaneously. This methodological approach allows researchers to move beyond the question of ‘whether’ a relationship exists to the more informative question of ‘how’ and ‘through what mechanisms’ it operates.

Importance of Large, Representative Samples

The study’s use of a large, representative sample of 1,605 students from both rural and urban schools in West Bengal has important methodological implications. The sample size provided sufficient statistical power to detect even small effects and to conduct complex multivariate analyses. The geographic and demographic diversity of the sample enhances the generalizability of the findings within the West Bengal context and provides a strong foundation for future comparative research. This study serves as a model for educational

research in India, demonstrating that it is both feasible and valuable to conduct large-scale, methodologically rigorous studies that go beyond convenience samples from a single school or district. Future research should strive for similar levels of methodological rigor, particularly when the goal is to inform policy and practice at a regional or national level.

5.5.3 Educational Implications for Classroom Practice

Creating Autonomy-Supportive, Competence-Building, and Relationally Warm Classrooms

The finding that ‘classroom climate’ is a significant predictor of both ‘Psychological Capital’ and ‘Student Engagement’, which in turn predict achievement, has direct and actionable implications for classroom practice. Teachers must recognize that their role extends far beyond delivering content; they are architects of learning environments that either support or undermine students’ psychological needs and engagement. To create ‘autonomy-supportive classrooms’, teachers should provide students with meaningful choices in their learning, explain the rationale for tasks and rules, acknowledge students’ perspectives and feelings, and minimize the use of controlling language and external rewards. To build ‘competence’, teachers should set appropriately challenging tasks, provide scaffolding and support, offer frequent and specific feedback that focuses on effort and strategies rather than ability, and create opportunities for students to experience mastery. To foster ‘relatedness’, teachers should invest time in getting to know their students as individuals, express genuine care and interest, create a sense of community and belonging in the classroom, and model respectful and supportive interactions.

Fostering Student Engagement Through Active, Meaningful Learning

The finding that ‘Student Engagement’ is the most powerful proximal predictor of achievement has profound implications for instructional practice. It suggests that the primary criterion by which teachers should evaluate their instructional strategies is: ‘Does this promote students’ behavioral, cognitive, and emotional engagement?’ Passive instructional methods—such as extended lectures, rote memorization, and worksheet completion—are unlikely to foster the kind of deep engagement that drives learning. Instead, teachers should prioritize ‘active learning strategies’ that require students to think, discuss, create, and apply their knowledge. Examples include ‘problem-based learning’, ‘project-based learning’, ‘inquiry-based science instruction’, ‘Socratic seminars’, ‘collaborative group work’, and ‘authentic performance tasks’.

5.5.4 Educational Implications for Parental Involvement Programs

Shifting from Traditional to Capacity-Building Models of Involvement

The finding that the effects of ‘parental involvement’ are largely mediated through ‘Psychological Capital’ and ‘Student Engagement’ has critical implications for how schools design and implement parental involvement programs. Traditional models of parental involvement often focus on getting parents to attend school events, monitor homework, or communicate with teachers. While these activities are valuable, the findings of this study suggest that they are not the end goal. The ultimate purpose of parental involvement should be to build students’ own capacity for successful learning. Therefore, parental involvement programs should shift their focus from simply encouraging parental presence to empowering parents with the knowledge and skills to foster their children’s ‘hope’, ‘efficacy’, ‘resilience’, ‘optimism’, and ‘engagement’.

5.5.5 Policy Implications

Investing in Teacher Professional Development

The findings underscore the critical importance of high-quality teacher professional development that goes beyond content knowledge and pedagogical techniques. To create the kinds of classroom climates that foster ‘Psychological Capital’ and ‘Student Engagement’, teachers need training in social-emotional learning, positive psychology, motivation theory, and relationship-building skills. Policymakers at the state and national levels should invest in developing and scaling up professional development programs that equip teachers with the knowledge and skills to create autonomy-supportive, competence-building, and relationally warm classrooms. This training should be ongoing, job-embedded, and collaborative, rather than one-off workshops.

Promoting Comprehensive, Multi-Tiered Systems of Support

The integrated nature of the study’s findings supports the adoption of comprehensive, multi-tiered systems of support (MTSS) that address students’ academic, behavioral, and social-emotional needs in a coordinated manner. The findings suggest that interventions should not be siloed. For example, a student struggling with low achievement may need not only academic support, but also interventions to build their ‘Psychological Capital’ and ‘engagement’. An MTSS framework provides a structure for schools to identify students’ needs, provide targeted interventions at varying levels of intensity, and monitor progress over time. The findings of this study can inform the design of such systems by highlighting the importance of targeting ‘Psychological Capital’ and ‘Student Engagement’ as key levers for improving student outcomes.

5.6 Limitations of the Study

While this study provides significant insights into the factors influencing English language achievement among secondary school students in West Bengal, it is essential to acknowledge its limitations. A critical and transparent discussion of these limitations is crucial for interpreting the findings appropriately and for guiding future research. The limitations of this study can be categorized into several key areas: methodological constraints, sampling limitations, measurement issues, potential biases, and contextual limitations.

5.6.1 Methodological Constraints

Cross-Sectional Design and Inability to Infer Causality

The most significant methodological limitation of this study is its ‘cross-sectional design’. All data were collected at a single point in time, which means that while the study can establish strong evidence of relationships among the variables, it cannot definitively infer causality (Shadish, Cook, & Campbell, 2002). The mediation models tested in this study, for example, are based on a theoretical assumption about the causal ordering of the variables (e.g., that ‘classroom climate’ influences ‘Psychological Capital’, which in turn influences achievement). However, the cross-sectional data do not allow for a direct test of this causal sequence. It is possible, for instance, that the relationships are reciprocal. Without longitudinal data, it is impossible to disentangle these complex, bidirectional relationships. Therefore, all interpretations of the findings must be framed in terms of ‘associations’ and ‘predictive relationships’, rather than ‘causal effects’.

Reliance on Self-Report Measures

Another major methodological constraint is the study’s reliance on ‘self-report questionnaires’ for all key variables except academic achievement. While self-report is an appropriate method for assessing internal psychological states like ‘Psychological Capital’ and perceptions of ‘classroom climate’, it is susceptible to several potential biases (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Students’ responses may be influenced by their current mood, their interpretation of the questionnaire items, and their desire to present themselves in a socially desirable light.

5.6.2 Sampling Limitations

Geographic Specificity

While the study employed a large and representative sample of 1,605 students from both rural and urban areas of 2 districts of West Bengal, the findings are still geographically specific to this particular state in India. The educational system and cultural context of West Bengal may differ in important ways from those of other states in India and from other countries. Therefore,

caution must be exercised when generalizing the findings to other populations (Henrich, Heine, & Norenzayan, 2010).

Exclusion of Certain School Types

The sampling frame for this study included government-aided and government-sponsored schools but did not include private, unaided schools or schools affiliated with national boards like the CBSE or CISCE. The exclusion of these schools from the sample limits the generalizability of the findings to the entire population of secondary school students in West Bengal.

5.6.3 Measurement Limitations

Use of Adapted Scales

Several of the scales used in this study were adapted from instruments originally developed and validated in Western contexts. While the scales were translated and adapted for the Indian context, and while they demonstrated good internal consistency reliability, their ‘construct validity’ in the Indian cultural context has not been fully established. It is possible that some of the items may have been interpreted differently by Indian students than by their Western counterparts (Van de Vijver & Leung, 1997).

Single-Item Measure of Achievement

Academic achievement was measured using students’ scores in English Achievement Test made for the purpose of this study. While this is an objective and relevant measure, it is still a single-item indicator of a complex construct. A single Achievement Test score may not fully capture the breadth of a student’s English language proficiency. A more comprehensive assessment of achievement, using multiple measures, would have provided a more robust and reliable outcome variable.

5.6.4 Potential Biases

Common Method Variance

Because all of the predictor and mediator variables were measured using self-report questionnaires administered at the same time, there is a potential for ‘common method variance’ to inflate the relationships among these variables (Podsakoff et al., 2003). The relationships among the self-report variables (‘classroom climate’, ‘parental involvement’, ‘Psychological Capital’, and ‘student engagement’) may be partially inflated due to common method bias.

Social Desirability Bias

Students may have been inclined to provide responses that they perceived as socially desirable, rather than responses that accurately reflected their true feelings and experiences (Crowne &

Marlowe, 1960). This bias would tend to inflate the mean scores on the self-report measures and could potentially distort the relationships among them.

5.6.5 Contextual Limitations

Focus on English Language Achievement

This study focused specifically on achievement in English. The findings may not generalize to other academic subjects. The factors that influence achievement in mathematics, science, or social studies may differ from those that influence achievement in a second language.

Lack of Data on Teacher and School Characteristics

The study did not collect data on teacher characteristics (e.g., experience, qualifications) or school characteristics (e.g., resources, leadership). These factors undoubtedly influence classroom climate and student achievement. Future research should incorporate multi-level designs that collect data from students, teachers, and schools to provide a more complete understanding.

5.7 Suggestions for Future Research

Building on the findings and limitations of the present study, several promising and necessary directions for future research emerge. These suggestions aim not only to address the limitations of this study but also to extend its findings, deepen the theoretical understanding of the processes involved, and provide a more robust evidence base for educational policy and practice. Each of the following suggestions represents a substantial research program that could significantly advance the field.

5.7.1 Longitudinal and Developmental Studies

Rationale: The most significant limitation of the present study is its cross-sectional design, which precludes the establishment of causality. To move beyond correlational evidence and understand the dynamic, developmental nature of the relationships identified, longitudinal research is essential (Singer & Willett, 2003). Academic achievement is not a static outcome but a developmental process that unfolds over time, shaped by the reciprocal interplay of personal and contextual factors.

Methodological Recommendations: Future research should employ multi-wave longitudinal designs, following a cohort of students over several years (e.g., from the beginning of middle school to the end of secondary school). Data on classroom climate, parental involvement,

Psychological Capital, student engagement, and achievement should be collected at regular intervals (e.g., annually or semi-annually). This would allow researchers to use advanced statistical techniques, such as cross-lagged panel models and latent growth curve modeling, to establish temporal precedence, examine reciprocal relationships, and model developmental trajectories. For instance, cross-lagged models could test whether changes in classroom climate at one-time point predict subsequent changes in Psychological Capital and engagement, which in turn predict later achievement. Growth curve models could chart the developmental trajectories of Psychological Capital, engagement, and achievement over time, and examine how these trajectories are influenced by stable and changing environmental factors.

Potential Research Questions: How do the relationships between classroom climate, Psychological Capital, and engagement evolve across the secondary school years? Are there critical periods during adolescence when students are particularly sensitive to the quality of their classroom climate or parental involvement? Do early experiences of a positive classroom climate have lasting effects on students' Psychological Capital and engagement in later years? Can we identify distinct developmental trajectories of engagement, and what early factors predict membership in different trajectory groups?

Expected Contributions: Longitudinal studies would provide a much more rigorous and nuanced understanding of the causal mechanisms underlying academic achievement, moving the field from a static, cross-sectional view to a dynamic, developmental perspective. Such research would clarify the temporal ordering of effects and would help identify optimal timing for interventions.

5.7.2 Experimental and Quasi-Experimental Intervention Studies

Rationale: While longitudinal studies can strengthen causal inference, the most powerful method for establishing causality is through experimental and quasi-experimental intervention research (Shadish, Cook, & Campbell, 2002). The findings of the present study suggest several promising targets for intervention. Rigorously designed intervention studies are needed to test the effectiveness of specific strategies aimed at improving these target variables and to determine whether such improvements lead to gains in academic achievement.

Methodological Recommendations: Future research should employ randomized controlled trials (RCTs) or strong quasi-experimental designs (e.g., regression discontinuity, propensity score matching) to evaluate the impact of specific interventions. For example, an RCT could

be designed to test the effectiveness of a professional development program aimed at helping teachers create more autonomy-supportive, competence-building, and relationally warm classroom climates. Teachers would be randomly assigned to receive the training or to a control group, and the effects on student perceptions of classroom climate, Psychological Capital, engagement, and achievement would be measured over time. Similarly, a study could evaluate the impact of a parent capacity-building program designed to teach parents strategies for fostering their children's Psychological Capital and engagement. Families would be randomly assigned to the program or a waitlist control, and the effects on parenting practices, student psychological resources, engagement, and achievement would be assessed. Student-focused positive psychology interventions could also be tested, where students receive direct instruction in skills related to hope, efficacy, resilience, and optimism.

Potential Research Questions: Can a targeted professional development program for teachers lead to measurable improvements in classroom climate and, subsequently, in student engagement and achievement? Does a parent education program focused on building Psychological Capital lead to greater gains in student achievement than a traditional program focused on homework help? What are the active ingredients of effective interventions? Is it more effective to target teachers, parents, or students directly, or is a multi-component intervention that targets all three most effective? How long do the effects of such interventions persist over time?

Expected Contributions: Intervention research would provide the strongest possible evidence for the causal impact of the variables identified in this study and would yield evidence-based, practical strategies that schools can implement to improve student outcomes. Such research would also help identify the mechanisms through which interventions work and the conditions under which they are most effective.

5.7.3 Multi-Level and Mixed-Methods Research

Rationale: The present study focused on student-level perceptions and outcomes. However, students are nested within classrooms, which are nested within schools, which are nested within communities. A more complete understanding of academic achievement requires a multi-level perspective that considers the influence of factors at all of these levels (Bryk & Raudenbush, 1992). Furthermore, quantitative data can only tell part of the story. Qualitative research is

needed to provide a deeper, more contextualized understanding of the processes and experiences underlying the quantitative findings.

Methodological Recommendations: Future research should employ multi-level modeling (MLM) to simultaneously examine the effects of student-level, classroom-level, and school-level factors on achievement. This would involve collecting data from multiple sources, including students (surveys of their perceptions, psychological states, and engagement), teachers (surveys of their beliefs, practices, and well-being, as well as classroom observations), and schools (administrative data on school resources, policies, and student demographics). Multi-level models could partition the variance in student achievement into within-classroom and between-classroom components, and could examine how classroom-level and school-level factors moderate the effects of student-level variables. Additionally, future research should incorporate qualitative methods to provide rich, descriptive data. This could involve in-depth case studies of a small number of schools or classrooms that are particularly effective (or ineffective) at fostering engagement and achievement, as well as in-depth interviews or focus groups with students, parents, and teachers to explore their perspectives, experiences, and strategies in their own words. Also future investigations are encouraged to adopt mixed methods designs that complement the quantitative findings of the present study with qualitative insights from in-depth interviews with students, teachers, and parents, which would provide richer contextual understanding of the mechanisms through which Classroom Climate and Parental Involvement influence Achievement in English.

Potential Research Questions: To what extent is the variation in student achievement attributable to differences between students, differences between classrooms, and differences between schools? Do school-level factors, such as principal leadership or school climate, moderate the effects of classroom climate on student outcomes? How do high-achieving students from disadvantaged backgrounds describe the role of their teachers and parents in their success? What are the day-to-day practices and interactions that distinguish highly effective teachers from less effective ones?

Expected Contributions: Multi-level and mixed-methods research would provide a more holistic, contextualized, and nuanced understanding of the factors influencing achievement, moving beyond individual-level explanations to a more ecological perspective. Qualitative data would add depth and meaning to the quantitative patterns, revealing the lived experiences behind the statistics.

5.7.4 Cross-Cultural and Comparative Research

Rationale: The present study was conducted in a specific cultural and geographic context (West Bengal, India). To test the generalizability of the findings and to develop a more universal theory of academic achievement, cross-cultural and comparative research is needed (Triandis, 1995). Such research can help to distinguish between universal psychological principles and culturally specific manifestations.

Methodological Recommendations: Future research should involve replicating this study in a variety of cultural contexts, both within India (e.g., in different states with different languages and cultural norms) and internationally (e.g., in other developing countries and in developed Western countries). Such studies should use culturally adapted and validated measures to ensure the comparability of the constructs across cultures. Researchers should be attentive to issues of measurement equivalence and should use appropriate statistical techniques (e.g., multi-group confirmatory factor analysis) to test whether the constructs have the same meaning across cultures. This line of research could also involve more fine-grained comparisons, such as examining differences between students from different religious or linguistic backgrounds within the same region.

Potential Research Questions: Is the integrated model of achievement validated in this study applicable in other cultural contexts? Does the relative importance of classroom climate versus parental involvement differ in individualistic versus collectivist cultures? Are the components of Psychological Capital (hope, efficacy, resilience, optimism) equally important in all cultures, or do their relative contributions vary? How do cultural values regarding education, authority, and family shape the nature and impact of parental involvement?

Expected Contributions: Cross-cultural research would lead to a more robust and generalizable theory of academic achievement and would provide valuable insights into how cultural context shapes the processes of learning and development. Such research would also help to identify universal principles that can inform educational practice globally, as well as culturally specific adaptations that may be necessary.

5.7.5 Exploring Additional Mediators and Moderators

Rationale: The present study identified Psychological Capital and Student Engagement as two important mediators of the effects of environmental factors on achievement. However, these are undoubtedly not the only mechanisms at play. A more complete understanding of the causal

chain requires the exploration of other potential mediators and moderators (Baron & Kenny, 1986).

Methodological Recommendations: Future research should incorporate measures of other theoretically relevant constructs to test more complex mediational and moderational models. Potential additional mediators to explore include academic self-concept (students' beliefs about their own academic abilities), achievement goal orientations (whether students are motivated by a desire to master content or to outperform others), and self-regulated learning strategies (the cognitive and metacognitive strategies that students use to manage their own learning). For instance, classroom climate might influence achievement not only through Psychological Capital and engagement but also by shaping students' academic self-concept, which in turn affects their willingness to take on challenging tasks. Potential moderators to explore include student personality traits (e.g., introversion-extroversion, conscientiousness), prior achievement, and family socioeconomic status. For example, the effect of classroom climate on engagement might be stronger for students who are more extroverted, or the effect of parental involvement might be more pronounced for students from lower socioeconomic backgrounds.

Potential Research Questions: Does academic self-concept mediate the relationship between classroom climate and engagement? Does student personality moderate the effect of classroom climate on Psychological Capital? Is the mediating role of parental involvement stronger for students from low-income families? Do the effects of the study variables differ for high-achieving versus low-achieving students?

Expected Contributions: Exploring additional mediators and moderators would lead to a more precise and comprehensive theoretical model, specifying not only the pathways of influence but also the conditions under which these pathways are stronger or weaker. This would allow for more targeted and personalized interventions.

5.7.6 Technology-Enhanced Learning and Digital Environments

Rationale: The present study focused on traditional classroom environments and face-to-face parental involvement. However, the educational landscape is rapidly evolving, with increasing integration of technology in teaching and learning (Selwyn, 2016). The COVID-19 pandemic has further accelerated this shift, making online and blended learning environments commonplace. Future research needs to examine whether the relationships identified in this

study hold in digital learning contexts and how technology can be leveraged to enhance classroom climate, parental involvement, Psychological Capital, and engagement.

Methodological Recommendations: Future studies should investigate the role of technology in mediating the relationships among study variables. This could involve examining online and blended learning environments by replicating the present study in fully online or blended learning contexts to determine whether the same factors predict achievement in digital environments. Research could also investigate digital parental involvement by exploring new forms of parental involvement enabled by technology, such as parent portals, learning management systems, and educational apps, and examining their impact on student outcomes. Additionally, researchers could evaluate technology-based interventions by testing the effectiveness of digital interventions designed to build Psychological Capital (e.g., online resilience training programs) or enhance engagement (e.g., gamified learning platforms). Learning analytics could also be employed, using data from learning management systems to track student engagement patterns in real time and to identify students at risk of disengagement.

Potential Research Questions: Do the same environmental and psychological factors predict achievement in online learning environments as in traditional classrooms? Can technology-mediated parental involvement (e.g., through parent portals) compensate for lower levels of face-to-face involvement? Are digital interventions aimed at building Psychological Capital as effective as face-to-face programs? How can learning analytics be used to provide early warning systems for student disengagement? What are the unique challenges and opportunities of creating a positive classroom climate in virtual learning environments?

Expected Contributions: Research in this area would help educators and policymakers understand how to create supportive, engaging digital learning environments and would provide evidence-based guidance for the effective integration of technology in education. This is particularly critical in the post-pandemic era, where hybrid and online learning are likely to remain prominent features of the educational landscape.

5.7.7 Neurobiological and Psychophysiological Correlates

Rationale: While the present study focused on self-reported psychological constructs, there is growing interest in understanding the neurobiological and psychophysiological mechanisms underlying learning, motivation, and achievement (Immordino-Yang & Damasio, 2007). Advances in neuroscience and psychophysiology offer new tools for examining how

environmental factors shape brain development and functioning, and how these neural changes in turn influence behavior and achievement.

Methodological Recommendations: Future research could incorporate neurobiological and psychophysiological measures to complement self-report and behavioral data. This could involve neuroimaging studies using functional magnetic resonance imaging (fMRI) or electroencephalography (EEG) to examine how experiences of positive classroom climate or high parental involvement are associated with patterns of brain activation related to motivation, emotion regulation, and cognitive control. Stress physiology research could measure cortisol levels (a biomarker of stress) to examine whether supportive classroom climates buffer students from the physiological effects of academic stress. Heart rate variability could be used as an index of emotional regulation, examining whether students with higher Psychological Capital show better physiological regulation during challenging academic tasks.

Potential Research Questions: Are students who perceive their classroom climate as more supportive characterized by different patterns of brain activation when faced with academic challenges? Does high parental involvement buffer students from the physiological stress response associated with high-stakes examinations? Are the components of Psychological Capital (hope, efficacy, resilience, optimism) associated with specific patterns of neural activation? How does chronic exposure to a negative classroom climate affect the development of brain regions involved in stress regulation and executive function?

Expected Contributions: This line of research would provide a deeper, more mechanistic understanding of how environmental and psychological factors influence achievement, bridging the gap between educational psychology and neuroscience. Such research could also identify biological markers of risk and resilience, potentially enabling earlier identification of students who need support.

5.7.8 Focus on Specific Vulnerable Populations

Rationale: While the present study examined the general population of secondary school students, certain sub-populations face unique challenges and may require tailored interventions. Future research should focus specifically on students who are at heightened risk of academic failure, including students with learning disabilities, students from linguistic minority backgrounds, students from economically disadvantaged families, and students who have experienced trauma or adverse childhood experiences (Masten, 2014).

Methodological Recommendations: Future studies should employ purposive sampling to recruit adequate numbers of students from specific vulnerable populations. Research designs could include comparative studies comparing the factors that predict achievement for vulnerable populations versus the general student population to identify unique predictors or differential effects. Intervention studies could be designed and tested specifically tailored to the needs of vulnerable populations (e.g., trauma-informed classroom practices for students who have experienced adversity). Resilience research could identify protective factors that enable some students from vulnerable populations to succeed despite adversity, and examine how these protective factors can be systematically fostered.

Potential Research Questions: Do students with learning disabilities benefit more or less from autonomy-supportive classroom climates compared to their typically developing peers? What forms of parental involvement are most effective for students from linguistic minority backgrounds whose parents may not speak English? Can interventions aimed at building Psychological Capital help to mitigate the negative effects of poverty on academic achievement? What are the characteristics of schools and classrooms that are particularly effective at supporting students who have experienced trauma? How can teachers be trained to recognize and respond to the unique needs of vulnerable students?

Expected Contributions: Research focused on vulnerable populations would ensure that educational interventions and policies are equitable and effective for all students, not just those from advantaged backgrounds. Such research would also contribute to the broader literature on resilience and would help identify the conditions that enable students to thrive despite adversity.

5.7.9 Examining the Role of Peer Relationships and Social Networks

Rationale: The present study focused on teacher-student relationships (as a component of classroom climate) and parent-child relationships (as reflected in parental involvement), but it did not explicitly examine the role of peer relationships. However, peers are a critical part of the social ecology of adolescence, and peer relationships have been shown to significantly influence motivation, engagement, and achievement (Wentzel, 2017). Future research should incorporate measures of peer support, peer norms, and social network characteristics to provide a more complete picture of the social influences on achievement.

Methodological Recommendations: Future studies should collect data on peer relationships using a variety of methods, including peer nomination techniques (asking students to nominate their friends and to rate their peers on various dimensions such as academic engagement and

supportiveness), social network analysis (mapping the structure of peer relationships within classrooms or schools and examining how network position, such as centrality or clustering, relates to engagement and achievement), and dyadic and group-level analyses (examining how characteristics of dyadic friendships, such as similarity in engagement levels, or peer group norms, such as whether high achievement is valued, influence individual student outcomes).

Potential Research Questions: Do students who have more academically engaged friends show higher levels of engagement themselves? Does the effect of classroom climate on engagement depend on the extent to which a student's peer group values academic achievement? Can peer mentoring or peer tutoring programs enhance both Psychological Capital and engagement? How do social network characteristics (e.g., being well-connected versus isolated) moderate the effects of classroom climate and parental involvement? Are there peer contagion effects, where engagement or disengagement spreads through social networks?

Expected Contributions: Incorporating peer relationships into the model would provide a more comprehensive, multi-layered understanding of the social influences on achievement and would open up new avenues for peer-based interventions. Such research could also inform strategies for creating positive peer cultures within schools and classrooms.

5.7.10 Policy Analysis and System-Level Research

Rationale: While the present study focused on individual students and their immediate environments (classrooms and families), broader educational policies and system-level factors also play a crucial role in shaping student outcomes. Future research should examine how state and national policies related to curriculum, assessment, teacher training, and school funding influence the variables identified in this study (Darling-Hammond, 2010).

Methodological Recommendations: Future research could employ policy analysis and system-level research methods, including comparative policy analysis (comparing student outcomes in states or countries with different educational policies, such as high-stakes testing versus formative assessment, or centralized versus decentralized curriculum), natural experiments (taking advantage of policy changes, such as a new teacher training requirement or a shift in funding formulas, to examine their effects on classroom climate, teacher practices, and student outcomes), and system dynamics modeling (using computational modeling to simulate how changes in policy variables might ripple through the educational system to affect student-level outcomes).

Potential Research Questions: Do policies that emphasize high-stakes testing undermine teachers' ability to create autonomy-supportive classroom climates? Does increased investment in teacher professional development lead to measurable improvements in classroom climate and student engagement? How do national curriculum policies influence the extent to which teachers can tailor instruction to meet the needs of diverse learners? What are the system-level barriers to effective parental involvement, and how can policy address these barriers? How do school funding formulas affect the resources available to support student Psychological Capital and engagement?

Expected Contributions: System-level research would provide insights into how educational policy can be designed to create the conditions that support positive classroom climates, effective parental involvement, and ultimately, student success. Such research would help bridge the gap between research and policy, ensuring that policy decisions are informed by robust evidence about what works.

5.8 SUMMARY OF THE STUDY

English language proficiency serves as a critical determinant of academic and professional success within a globalized world. Nevertheless, a significant gap has existed in comprehending the complex interplay of environmental, familial, psychological, and behavioral factors that shape achievement in English, particularly within the Indian educational context. This investigation addressed this gap by exploring the relationships among ‘classroom climate’, ‘parental involvement’, ‘psychological capital’, and ‘student engagement’ as predictors of ‘Achievement in English’ among secondary school students in West Bengal. The research specifically analyzed the mediating roles of ‘psychological capital’ and ‘student engagement’ in the pathways extending from ‘classroom climate’ and ‘parental involvement’ to English achievement.

The theoretical framework that underpinned this investigation was constructed through an integration of four major theories: ‘Social Cognitive Theory’, which underscores the role of environmental influences on learning; ‘Positive Psychology’, which emphasizes the importance of psychological resources such as resilience and optimism; ‘Engagement Theory’, which concentrates on the behavioral, emotional, and cognitive involvement of students in their learning; and ‘Family Systems Theory’, which examines the contributions of family dynamics to academic success. This multi-faceted theoretical approach offered a comprehensive lens for understanding the various pathways through which different factors shape English language learning outcomes. The investigation hypothesized that both ‘classroom climate’ and ‘parental

involvement’ would exert direct effects on ‘Achievement in English’, in addition to indirect effects mediated by ‘psychological capital’ and ‘student engagement’.

A review of relevant literature confirmed the individual importance of these variables. Studies have consistently shown that a positive ‘classroom climate’ fosters motivation and participation, while supportive ‘parental involvement’ establishes a conducive learning environment at home. Similarly, ‘psychological capital’ (encompassing hope, efficacy, resilience, and optimism) has been associated with students’ capacity to surmount academic challenges. ‘Student engagement’ is broadly acknowledged as a proximal predictor of academic success. Nevertheless, few investigations had integrated these constructs into a single mediational model, particularly within the unique socio-cultural and linguistic context of government-aided schools in West Bengal.

SIGNIFICANCE OF THE STUDY

The significance of this research can be understood across three key dimensions:

- **Theoretical Significance:** By integrating multiple theoretical domains—environmental, psychological, and behavioral—into a unified model, this research has contributed to theory-building in educational psychology. It has also aided in the cross-cultural validation of Western psychological constructs by testing their applicability and function within the Indian secondary education system.
- **Empirical Significance:** The study has provided robust, large-scale quantitative evidence of the relationships among the variables. Through the application of ‘regression and mediation analyses’, it has clarified the direct and indirect pathways that lead to English achievement, offering an empirical foundation for future comparative and intervention-based research.
- **Practical Significance:** For educators, administrators, and policymakers, the findings offer actionable insights. The results can inform the design of teacher training programs, parental awareness initiatives, and classroom-level practices aimed at fostering supportive learning environments. By highlighting the critical mediating roles of ‘psychological capital’ and ‘student engagement’, the study suggests that academic outcomes can be significantly improved by strengthening these psychosocial processes, even within existing resource constraints.

STATEMENT OF THE PROBLEM

The formal statement of the problem for this research was: “Relationship of Classroom Climate and Parental Involvement with the Achievement of Secondary School Students in English: Mediating Role of the Psychological Capital and Engagement.”

OPERATIONAL DEFINITIONS OF THE TERMS USED

- **Parental Involvement:** The perceived involvement of parents in various aspects of their children’s lives, including academics, relationships, discipline, decision-making, and the provision of facilities and resources.
- **Classroom Climate:** Students’ perceptions of their classroom environment, encompassing its physical, social, emotional, and intellectual characteristics.
- **Achievement in English:** The marks obtained by students on a researcher-developed ‘English Achievement Test’ (EAT) designed to evaluate proficiency in reading comprehension, vocabulary, and grammar, aligned with the West Bengal secondary school curriculum.
- **Psychological Capital (PsyCap):** An individual’s positive psychological state of development, characterized by four dimensions: Hope, Efficacy, Resilience, and Optimism (HERO).
- **Engagement:** A psychological process reflecting a student’s interest, investment, and effort in learning, measured across three dimensions: Cognitive, Emotional, and Behavioral Engagement.
- **Secondary School Students:** Male and female students studying in Class XII in Government-sponsored secondary schools affiliated with the West Bengal Council of Higher Secondary Education (WBCHSE).

OBJECTIVES OF THE STUDY

The primary objectives of this study were:

- To explore the nature of the classroom climate and the levels of parental involvement, psychological capital, and engagement among secondary students.
- To identify differences in the study variables based on gender and the locale (urban/rural) of the school.

- To determine the interrelationships among classroom climate, parental involvement, psychological capital, engagement, and achievement in English.
- To investigate the mediating role of Psychological Capital in the relationship between parental involvement and English achievement.
- To investigate the mediating role of Engagement in the relationship between parental involvement and English achievement.
- To investigate the mediating role of Psychological Capital in the relationship between classroom climate and English achievement.
- To investigate the mediating role of Engagement in the relationship between classroom climate and English achievement.

HYPOTHESIS OF THE STUDY

The study tested the following alternative hypotheses:

1. There exists significant difference in perceived classroom climate and level of parental involvement, psychological capital, engagement and academic achievement among secondary school students on the basis of gender and locale of school.
2. There exists significant relationship between classroom climate and psychological capital and engagement among secondary school students.
3. There exists significant relationship between parental involvement and psychological capital and engagement among secondary school students.
4. There exists significant relationship of classroom climate, parental involvement, psychological capital and engagement to academic achievement among secondary school students.
5. Psychological Capital mediates relationship between Parental involvement and English academic achievement of the secondary school students
6. Academic Engagement mediates relationship between the Parental involvement and English achievement of the secondary school students.
7. Psychological Capital mediates relationship between classroom climate and English achievement of the secondary school students.
8. Academic engagement mediates relationship between classroom climate and English achievement of the secondary school students.

DELIMITATIONS OF THE STUDY

The study was bounded by the following delimitations:

- **Geographical Scope:** The research was confined to government-sponsored and aided secondary schools in the North 24 Parganas and Nadia districts of West Bengal, India, representing both urban and rural areas.
- **Population and Sample:** The study's population was limited to students in Class XII under the West Bengal Council of Higher Secondary Education (WBCHSE). A stratified random sampling technique was employed to select participants from these two districts.
- **Variables Studied:** The investigation focused exclusively on the five specified constructs—classroom climate, parental involvement, psychological capital, student engagement, and achievement in English—excluding other potentially relevant variables such as teacher efficacy, peer influence, or socio-economic status.
- **Measurement Instruments:** Data were collected via self-report instruments, which reflect students' perceptions and are subject to the inherent limitations of such measures.
- **Temporal Frame:** A 'cross-sectional design' was utilized, with all data gathered at a single point in time, which constrains the capacity to draw causal inferences.

METHODOLOGY

A quantitative, cross-sectional survey design was implemented. A stratified random sampling technique was employed, with North 24 Parganas and Nadia districts serving as the population base. Data were gathered from a large and representative sample of 1,605 secondary school students (52.6% female, 47.4% male; ages 16-17) from 107 schools across these two districts. The following validated instruments were employed for data collection:

- **Classroom Climate Scale:** A 20-item refined and validated scale measuring the supportive nature of the learning environment.
- **Perceived Parental Involvement Scale:** A 15-item refined and validated scale assessing students' perceptions of their parents' engagement in their education.
- **Psychological Capital Scale:** A 15-item refined and validated scale evaluating hope, efficacy, resilience, and optimism.
- **Student Engagement Scale:** A 12-item refined and validated scale measuring behavioral, emotional, and cognitive involvement.

- **Achievement in English Test:** A standardized and refined 30-item MCQ-type test developed by the researcher to assess English proficiency.

All instruments demonstrated excellent psychometric properties, with Cronbach's alpha reliability coefficients exceeding .90.

PROCEDURE

After securing necessary permissions from school authorities, the researcher administered the battery of questionnaires to the participating students. Ethical considerations, including informed consent and the assurance of confidentiality, were rigorously upheld. Participants were provided clear instructions and sufficient time (approximately 45 minutes) to complete the surveys during school hours.

STATISTICAL TECHNIQUES

The gathered data were analyzed using a systematic progression from simple to complex analytical techniques, as advised by the Research Advisory Committee. The analysis began with descriptive statistics to provide a full description of the variables, including measures of central tendency (mean, median, mode) and variability (standard deviation, range). Independent samples t-tests were conducted to examine group differences based on gender and locale, as MANOVA was deemed unnecessary.

The relationships between variables were first explored using Pearson correlation analysis to establish bivariate associations. Simple linear regression analyses were then conducted to examine the direct effect of each independent variable on the dependent variable (Achievement in English), demonstrating the multiplicity of variables with one dependent and one independent variable at a time. The analysis then progressed to multiple linear regression to examine the combined effects of all predictors while controlling for one another.

Finally, two separate mediation analyses were conducted using the jAMM module of Jmovi, with bootstrap validation procedures employing 5,000 resamples. These mediation analyses tested the indirect effects of 'classroom climate' and 'parental involvement' on 'Achievement in English' through the mediators of 'psychological capital' and 'student engagement'. All analyses were written in past or present perfect tense, as recommended. The variable of socio-economic status was removed from all analyses to maintain focus on the core theoretical constructs.

DATA ANALYSIS AND INTERPRETATION

The analysis yielded strong empirical support for the proposed theoretical model and confirmed all hypotheses.

- **Descriptive Statistics:** The first research objective, which had been missing in earlier drafts, was fully addressed through comprehensive descriptive analysis. The descriptive statistics table included mean, median, and mode for all variables. Classroom climate scores were generally high (Mean = 60.01, Median = 60.00, Mode = 60.0), indicating predominantly positive learning environments. Parental involvement levels showed moderate engagement (Mean = 34.84, Median = 34.00, Mode = 34.0). Psychological capital (Mean = 41.96, Median = 42.00, Mode = 42.0) and student engagement (Mean = 33.66, Median = 34.00, Mode = 35.0) were at moderate levels. Achievement in English showed substantial variability (Mean = 15.24, Median = 15.00, Mode = 17.0, SD = 7.16, range 0-30), indicating diverse English language learning outcomes.
- **Group Differences:** Independent samples t-tests revealed no significant differences between male and female students across any study variables (all $p > .05$), confirming excellent gender equivalence. However, significant differences were found based on school locale, with urban students reporting higher levels of parental involvement ($p < .001$, $d = .186$) and achieving higher scores in English ($p = .002$, $d = .164$).
- **Correlations:** All study variables were found to be significantly and positively correlated with each other, with correlation coefficients (r) ranging from .252 to .586 ($p < .001$). This provided strong support for the interconnected theoretical framework and an excellent foundation for subsequent regression and mediation analyses.
- **Simple Regression:** Each independent variable was first examined individually in relation to the dependent variable. Simple linear regression analyses demonstrated that ‘classroom climate’, ‘parental involvement’, ‘psychological capital’, and ‘student engagement’ each had significant positive effects on ‘Achievement in English’ when examined one at a time.
- **Multiple Regression:** When all predictors were entered simultaneously in a multiple regression model, both ‘classroom climate’ ($\beta = .069$, $p = .007$) and ‘parental involvement’ ($\beta = .105$, $p < .001$) had significant positive direct effects on ‘Achievement in English’. ‘Student engagement’ emerged as the strongest predictor ($\beta = .327$, $p < .001$), followed by ‘psychological capital’ ($\beta = .191$, $p < .001$). The comprehensive model successfully explained 31.4% of the variance in ‘Achievement in English’, which represents a large effect size.

- **Mediation Effects:** Two separate mediation analyses were conducted as advised. All four hypothesized mediation pathways were confirmed through bootstrap procedures:
 1. ‘Psychological capital’ significantly mediated the effect of ‘classroom climate’ on ‘Achievement in English’ (indirect effect significant at $p < .001$).
 2. ‘Student engagement’ significantly mediated the effect of ‘classroom climate’ on ‘Achievement in English’ (indirect effect significant at $p < .001$), showing the strongest mediation effect.
 3. ‘Psychological capital’ significantly mediated the effect of ‘parental involvement’ on ‘Achievement in English’ (indirect effect significant at $p < .001$).
 4. ‘Student engagement’ significantly mediated the effect of ‘parental involvement’ on ‘Achievement in English’ (indirect effect significant at $p < .001$).

‘Student engagement’ emerged as the most powerful mediator overall, suggesting it is a primary mechanism through which environmental and family support translates into learning outcomes.

FINDINGS

The objective-wise findings of the study are summarized below:

Objective 1: To explore the nature of the classroom climate and the levels of parental involvement, psychological capital, and engagement among secondary students.

- The sample comprised 1,605 secondary school students from 107 schools with excellent representativeness: 52.6% female, 47.4% male; 66.4% rural, 33.6% urban; mean age 16.74 years.
- All study variables demonstrated normal distributions suitable for parametric analyses, with skewness and kurtosis values within acceptable ranges (all $< |2.0|$).
- Achievement in English showed substantial variability (Mean = 15.24, Median = 15.00, Mode = 17.0, SD = 7.160, range 0-30), indicating diverse English language learning outcomes.
- Classroom climate scores were generally high (Mean = 60.01, Median = 60.00, Mode = 60.0, SD = 3.945, range 45-71), suggesting predominantly positive learning environments.
- Parental involvement levels showed moderate to high engagement (Mean = 34.84, Median = 34.00, Mode = 34.0, SD = 8.224, range 15-59) with considerable family variation.

- Psychological capital was at moderate levels (Mean = 41.96, Median = 42.00, Mode = 42.0, SD = 10.03, range 17-72).
- Student engagement was at moderate levels (Mean = 33.66, Median = 34.00, Mode = 35.0, SD = 8.26, range 12-59).

Objective 2: To identify differences in the study variables based on gender and the locale (urban/rural) of the school.

- Gender comparisons revealed no significant differences across any study variables (all $p > .05$, effect sizes $-.049$ to $.011$), confirming excellent gender equivalence.
- Location comparisons showed significant differences in parental involvement ($p < .001$, $d = .186$) and Achievement in English ($p = .002$, $d = .164$), with urban students scoring higher.
- No significant Location $\times$ Gender interactions were found (all $p > .05$), indicating consistent demographic patterns across groups.
- Findings support broad applicability of the theoretical model across diverse student populations.

Objective 3: To determine the interrelationships among classroom climate, parental involvement, psychological capital, engagement, and achievement in English.

- All 10 correlations among study variables achieved statistical significance ($p < .001$), providing strong support for the interconnected theoretical framework.
- Correlation magnitudes ranged from moderate ($r = .252$) to strong ($r = .586$), with 60% demonstrating large effects ($r \geq .50$).
- Partial correlations controlling for demographics remained robust and significant, confirming relationships are not demographic artifacts.
- The correlation pattern supported theoretical predictions and provided an excellent foundation for regression and mediation analyses.
- Simple regression analyses demonstrated that each predictor individually had a significant positive effect on Achievement in English.
- Multiple regression analysis revealed that when all predictors were considered simultaneously, 'classroom climate' demonstrated a significant positive direct effect on

Achievement in English ($\beta = .069$, $p = .007$), and 'parental involvement' showed a significant positive direct effect on Achievement in English ($\beta = .105$, $p < .001$).

- The model accounted for 31.4% variance in Achievement in English, representing a large effect.
- 'Student engagement' emerged as the strongest predictor ($\beta = .327$, $p < .001$), followed by 'psychological capital' ($\beta = .191$, $p < .001$).

Objectives 4-7: To investigate the mediating roles of Psychological Capital and Student Engagement in the relationships between environmental/family factors and Achievement in English.

- Two separate mediation analyses were conducted as advised by the Research Advisory Committee.
- 'Psychological capital' significantly mediated the 'classroom climate'-'Achievement in English' relationship (indirect effect significant at $p < .001$).
- 'Student engagement' significantly mediated the 'classroom climate'-'Achievement in English' relationship (indirect effect significant at $p < .001$), showing the strongest mediation effect.
- 'Psychological capital' significantly mediated the 'parental involvement'-'Achievement in English' relationship (indirect effect significant at $p < .001$).
- 'Student engagement' significantly mediated the 'parental involvement'-'Achievement in English' relationship (indirect effect significant at $p < .001$).
- All four hypothesized mediation pathways were confirmed through bootstrap procedures with 5,000 resamples.
- 'Classroom climate' operated primarily through indirect pathways, with a substantial portion of its total effect mediated through 'psychological capital' and 'student engagement'.
- 'Parental involvement' showed balanced influences, with significant effects occurring through both direct and indirect pathways.
- 'Student engagement' emerged as the most important mediator overall, demonstrating the strongest effects for both 'classroom climate' and 'parental involvement'.

- Partial mediation was confirmed for both predictors, as direct effects remained significant alongside substantial indirect effects.
- Findings demonstrate multiple mechanisms through which environmental and family factors influence Achievement in English.

IMPLICATIONS OF THE STUDY

This study has offered significant theoretical and practical implications. Theoretically, it has advanced our understanding of how external environmental factors are translated into academic outcomes through internal psychological and behavioral mechanisms. It has confirmed that factors like ‘classroom climate’ and ‘parental involvement’ do not operate in a vacuum but influence achievement by nurturing students’ ‘psychological capital’ and fostering their ‘engagement’ in learning.

Practically, the findings strongly advocate for the adoption of comprehensive, multi-pronged intervention strategies. Instead of focusing on single factors in isolation, schools and educators should aim to simultaneously:

- Create Positive Classroom Climates: Foster supportive, respectful, and intellectually stimulating learning environments.
- Promote Meaningful Parental Involvement: Develop stronger home-school partnerships.
- Develop Psychological Capital: Implement programs to build students’ hope, self-efficacy, resilience, and optimism.
- Enhance Student Engagement: Use pedagogical strategies that boost students’ active involvement in their learning.

Educational policies should be reoriented to support these multi-pathway approaches, with resource allocation prioritizing the student-centered factors of ‘psychological capital’ and ‘engagement’, which have demonstrated the strongest mediating effects.

CONCLUSION

In conclusion, this investigation examined the intricate relationships between ‘classroom climate’, ‘parental involvement’, and English language achievement among secondary school students in the North 24 Parganas and Nadia districts of West Bengal. The research also analyzed the mediating roles of ‘psychological capital’ and ‘student engagement’ within these relationships. The findings have demonstrated that both a positive classroom climate and active parental involvement served as significant predictors of students’ achievement in English.

Furthermore, the investigation has offered strong evidence for the mediating effects of ‘psychological capital’ (encompassing hope, efficacy, resilience, and optimism) and ‘student engagement’ (behavioral, emotional, and cognitive). These factors have functioned as crucial mechanisms through which classroom and family environments shaped academic outcomes. The results revealed that a supportive classroom and involved parents fostered higher levels of ‘psychological capital’ and ‘engagement’, which consequently led to better performance in English.

These findings carry important implications for educators, parents, and policymakers. They emphasize the necessity for a holistic approach that addresses not only the learning environment but also the psychological and behavioral resources of students. Interventions designed to enhance classroom climate, promote parental involvement, and develop students’ ‘psychological capital’ and ‘engagement’ are likely to prove effective in improving English language achievement. This research has advanced a deeper understanding of the complex interplay of factors that shape language learning and has provided valuable insights for formulating targeted educational strategies.

5.9 Concluding Remarks

This study embarked on an ambitious journey to unravel the complex web of factors that contribute to English language achievement among secondary school students in West Bengal. By integrating insights from ‘Social Cognitive Theory’, ‘Self-Determination Theory’, ‘Positive Psychology’, and ‘Engagement Theory’, the research moved beyond a simplistic search for single causes to a more holistic and nuanced exploration of the mechanisms through which environmental supports are translated into academic success. The findings paint a clear and compelling picture: supportive classroom climates and involved parents foster students’ psychological resources and active engagement, which in turn pave the way for higher achievement. The study underscores the profound importance of ‘student engagement’ as the final common pathway to learning, and it highlights the critical role of teachers and parents in creating the conditions that make such engagement possible.

While the study has limitations, its findings have significant implications for theory, practice, and policy. Theoretically, the study validates an integrated ‘socio-ecological model’ of achievement and demonstrates the cross-cultural applicability of key Western theories. Practically, it provides a clear, evidence-based roadmap for educators, school leaders, and parents seeking to support student success. The findings call for a shift in focus from a narrow emphasis on curriculum and instruction to a more holistic approach that prioritizes positive

relationships, psychological well-being, and active student engagement. For policymakers, the study highlights the need for comprehensive, multi-pronged initiatives that address the interconnectedness of classroom, family, and student-level factors.

In the end, the message of this research is one of empowerment and hope. It suggests that academic achievement is not a fixed outcome determined by innate ability or background, but is rather a malleable product of the environments we create and the psychological resources we cultivate. By fostering supportive classroom climates, by empowering parents to be effective partners in their children's education, and by systematically building students' 'hope', 'efficacy', 'resilience', and 'optimism', we can unlock their potential and set them on a path to lifelong learning and success. This study provides a scientific foundation for this hopeful vision and offers a clear direction for the work that lies ahead.

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Appendices

LIST OF APPENDICES

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To,

The Principal / Head of Institution

Subject: Doctoral Research Study Information Statement for School Principals / Heads of Institutions / Coordinators

Respected Sir/Madam,

I am Palash Majumder, a research scholar in the School of Education, Lovely Professional University (LPU), Phagwara, Punjab. I am conducting my doctoral research under the supervision and guidance of Prof. Dr. Nimisha Beri, Professor and Head, School of Education, Lovely Professional University.

I seek your kind permission to involve students of your esteemed institution in my doctoral research study. The details of the study are as follows:

Doctoral Research Study Details

Title of the Research:

Relationship of Classroom Climate and Parental Involvement with the Achievement of Secondary School Students in English: Mediating Role of Psychological Capital and Engagement

Aim of the Research:

The study aims to examine how school and home environments contribute to students' psychological capital, engagement, and English achievement. It seeks to explore the associations among classroom climate, parental involvement, psychological capital, student engagement, and English academic outcomes among secondary school students.

Who will participate:

Approximately 20 students from Class XII (from any academic stream—Science, Commerce, or Humanities) will participate in this study. Both boys and girls from diverse socio-economic and cultural backgrounds will be included to ensure fair and representative participation.

Benefits of the Research Study to Schools:

The findings of this study will be shared with participating institutions. Insights derived from the analysis can help teachers and school leaders enhance classroom climate, strengthen parental collaboration, and design programs that foster engagement, motivation, and achievement among senior secondary students—particularly in English.

Risks involved in the study:

None. The study involves completing questionnaires and a short English Achievement Test. It does not involve any psychological, physical, or academic risk to participants.

Ethical considerations:

This study strictly adheres to the ethical guidelines of Lovely Professional University's Institutional Ethics Committee. Permission is being sought from you and your school to conduct the data collection. All responses will remain anonymous, and no personally identifiable information (student name, parent details, or school identifiers) will be disclosed. The data will be used purely for academic purposes and will remain strictly confidential. No photography, videography, or audio recording will be done at any stage.

Mode of Data Collection:

The data will be collected in physical mode through printed questionnaires and standardized research instruments. The process will be carried out within school premises during regular hours. All research helpers involved in this process are trained in ethical data collection procedures, and I will personally supervise the process to ensure accuracy and compliance.

Researcher Contact Details:

For any queries or clarifications, please feel free to contact:

Name: Palash Majumder

Email: rajumajumder56@gmail.com

Mobile: 7001952801

Institution: Lovely Professional University (LPU), Phagwara, Punjab

I sincerely thank you for your kind cooperation and support in facilitating this academic endeavor. Your valuable assistance will contribute significantly to the successful completion of this research work.

Thanking you,

Yours faithfully,

(Signature)

Palash Majumder

Research Scholar (Ph.D. – Part Time)

School of Education

Lovely Professional University (LPU), Phagwara, Punjab

Place: West Bengal

Date: _____

CLASSROOM CLIMATE SCALE

ADMINISTRATOR INSTRUCTIONS

Purpose: To measure students' perceptions of their classroom environment

Number of Items: 20 items

Time Required: 10-12 minutes

Special Note: This scale contains 10 negatively worded items (marked with *) that require reverse scoring.

ADMINISTRATION SCRIPT

Say to students:

"Good morning/afternoon. Today you will complete a questionnaire about your classroom environment. This is not a test. There are no right or wrong answers. We want your honest opinions.

The questionnaire will take about 10-12 minutes. Your responses will be kept completely confidential. Your teachers will not see your individual answers.

Please fill in the demographic information first, then read the instructions carefully before starting. Answer all questions honestly. Raise your hand if you have questions.

You may begin now."

During administration: Monitor quietly, answer questions neutrally, give a 2-minute warning near the end.

After completion: "Please check that you have answered all 20 questions. Thank you for your participation."

STUDENT QUESTIONNAIRE

DEMOGRAPHIC INFORMATION

Student Identification Number or Name (Optional): _____

Class and Section: _____

School Name: _____

School Locale: ☐ Rural ☐ Urban

Gender: ☐ Male ☐ Female ☐ Other

Date: _____

INSTRUCTIONS FOR STUDENTS

Dear Student,

This questionnaire asks about your classroom environment. Please read each statement carefully and mark the option that best describes your opinion. Think about your current classroom when responding.

There are no right or wrong answers. Your honest responses will help us improve the learning environment. All responses are confidential.

Mark (✓) one option for each statement:

- **Strongly Agree** – You completely agree
- **Agree** – You agree
- **Neutral** – You neither agree nor disagree
- **Disagree** – You disagree
- **Strongly Disagree** – You completely disagree

Note: Some statements are marked with *. Please read these carefully.

Time: 10-12 minutes

QUESTIONNAIRE ITEMS

No.	Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	Our teacher spends little time talking to us.*					
2	Our teacher gives a chance to each student of my class to talk to him or her.					
3	Leaders in my class are selected according to their abilities rather than position in the exams.					
4	Our teacher just reads from the text book while teaching a lesson in class.*					
5	Our teacher listens to us before she or he gives us punishment.					
6	Good discipline is maintained in my class.					
7	Our teacher has to keep on shouting to make the students quiet.*					
8	Discussion in my class ends up in confusion.*					
9	Our class is very noisy.*					
10	I feel uncomfortable with my teachers behavior.*					
11	Our teacher forgets the names of the students in the class.*					
12	Our classroom is cleaned everyday of the week.					
13	Students in my class take part in interclass competitions.					
14	In my class, we go on talking to each other even in the presence of the teacher.*					

No.	Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
15	Our teacher discourages us from asking questions in the class.*					
16	Students enjoy class room activities so much that they dislike to remain absent from school.					
17	Teachers say that our class is well behaved.					
18	The activities in my class are planned in advance.					
19	I feel my class is like a prison.*					
20	Our teacher uses different teaching aids like charts, models etc. while teaching a lesson.					

Please check that you have answered all 20 questions. Thank you!

SCORING INSTRUCTIONS

STEP 1: IDENTIFY ITEM TYPES

Positive Items (10 items): 2, 3, 5, 6, 12, 13, 16, 17, 18, 20

Negative Items (10 items): 1, 4, 7, 8, 9, 10, 11, 14, 15, 19 (marked with *)

STEP 2: ASSIGN POINTS

For Positive Items (2, 3, 5, 6, 12, 13, 16, 17, 18, 20):

Response	Points
Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

For Negative Items (1, 4, 7, 8, 9, 10, 11, 14, 15, 19) - REVERSE SCORE:

Response	Points
Strongly Agree	1
Agree	2
Neutral	3
Disagree	4

Response	Points
Strongly Disagree	5

STEP 3: CALCULATE TOTAL SCORE

- 1 Score all positive items using the positive scoring key
- 2 Score all negative items using the reverse scoring key
- 3 Add all 20 item scores together
- 4 **Total Score = Sum of all items**

Possible Score Range: 20 to 100

SCORING EXAMPLE

Example 1 - Positive Item:

Item 2: "Our teacher gives a chance to each student..."

Student marks: **Agree** → Score = **4 points**

Example 2 - Negative Item (Reverse Scored):

Item 1: "Our teacher spends little time talking to us."

Student marks: **Agree** → Score = **2 points** (reversed)

Student marks: **Disagree** → Score = **4 points** (reversed)

QUICK REFERENCE GUIDE

Administration Time: 10-12 minutes

Total Items: 20

Response Scale: 5-point Likert (Strongly Agree to Strongly Disagree)

Scoring:

- Positive items: 5-4-3-2-1
- Negative items: 1-2-3-4-5 (reverse)

Score Range: 20-100

Reliability: Cronbach's Alpha > 0.90

END OF CLASSROOM CLIMATE SCALE

PARENTAL INVOLVEMENT SCALE

ADMINISTRATOR INSTRUCTIONS

Purpose: To measure the level of parental involvement in students' education

Number of Items: 15 items

Time Required: 5-7 minutes

Special Note: All items are positively worded. Higher scores indicate greater parental involvement.

ADMINISTRATION SCRIPT

Say to students:

"Good morning/afternoon. Today you will complete a questionnaire about your parents' involvement in your education. This is not a test. There are no right or wrong answers. We want your honest opinions about how your parents support your learning.

The questionnaire will take about 5-7 minutes. Your responses will be kept completely confidential. Your teachers and parents will not see your individual answers.

Please fill in the demographic information first, then read the instructions carefully before starting. Answer all questions honestly based on what your parents actually do. Raise your hand if you have questions.

You may begin now."

During administration: Monitor quietly, answer questions neutrally, give a 2-minute warning near the end.

After completion: "Please check that you have answered all 15 questions. Thank you for your participation."

STUDENT QUESTIONNAIRE

DEMOGRAPHIC INFORMATION

Student Identification Number or Name (Optional): _____

Class and Section: _____

School Name: _____

School Locale: ☐ Rural ☐ Urban

Gender: ☐ Male ☐ Female ☐ Other

Date: _____

INSTRUCTIONS FOR STUDENTS

Dear Student,

This questionnaire asks about your parents' involvement in your education. Please read each statement carefully and mark how often your parents do the activities mentioned.

There are no right or wrong answers. Your honest responses will help us understand the role of parents in student learning. All responses are confidential.

Mark (✓) one option for each statement:

- **Always** – Your parents do this all the time
- **Mostly** – Your parents do this most of the time
- **Sometimes** – Your parents do this occasionally
- **Rarely** – Your parents do this very seldom or almost never

Time: 5-7 minutes

QUESTIONNAIRE ITEMS

No.	Statements	Always	Mostly	Sometimes	Rarely
1	My parents enquire me about the home work given in class.				
2	My parents take my opinions seriously while making decisions.				
3	My parents want me to spend my time usefully.				
4	My parents help me to complete the assignments, and projects on time.				
5	My parents patiently listen to my problems.				
6	My parents are particular that I come back home before a specific time.				
7	My parents regularly ask my teachers about my progress.				
8	My parents provide me a good atmosphere to study by sacrificing their own comforts.				
9	My parents insist me to read aloud to correct my vocabulary and pronunciation.				
10	My parents want me to learn lessons from great people.				
11	My parents spend time with me.				
12	My parents encourage me to read newspapers, books and magazines that enhance general knowledge.				
13	My parents guide me visit useful internet sites.				
14	My parents monitor me when I use internet.				
15	My parents are interested to know about my teachers' attitude towards me.				

Please check that you have answered all 15 questions. Thank you!

SCORING INSTRUCTIONS

STEP 1: ASSIGN POINTS

For All Items (All 15 items are positively worded):

Response	Points
Always	4
Mostly	3
Sometimes	2
Rarely	1

STEP 2: CALCULATE TOTAL SCORE

- 1 Score all 15 items using the scoring key above
- 2 Add all 15 item scores together
- 3 **Total Score = Sum of all items**

Possible Score Range: 15 to 60

SCORING EXAMPLE

Example:

Item 1: "My parents enquire me about the home work given in class."

- Student marks: **Always** → Score = **4 points**
- Student marks: **Mostly** → Score = **3 points**
- Student marks: **Sometimes** → Score = **2 points**
- Student marks: **Rarely** → Score = **1 point**

Sample Calculation:

If a student scores:

- Items 1-5: Always (4 points each) = 20 points
- Items 6-10: Mostly (3 points each) = 15 points
- Items 11-15: Sometimes (2 points each) = 10 points

Total Score = 20 + 15 + 10 = 45 points (High Parental Involvement)

QUICK REFERENCE GUIDE

Administration Time: 5-7 minutes

Total Items: 15

Response Scale: 4-point frequency scale (Always, Mostly, Sometimes, Rarely)

Scoring:

- Always = 4, Mostly = 3, Sometimes = 2, Rarely = 1
- All items scored the same way (no reverse scoring)

Score Range: 15-60

Reliability: Cronbach's Alpha > 0.90

END OF PARENTAL INVOLVEMENT SCALE

PSYCHOLOGICAL CAPITAL ASSESSMENT SCALE

ADMINISTRATOR INSTRUCTIONS

Purpose: To measure students' psychological capital (hope, efficacy, resilience, and optimism)

Number of Items: 15 items

Time Required: 6-8 minutes

Special Note: All items are positively worded. Higher scores indicate greater psychological capital.

ADMINISTRATION SCRIPT

Say to students:

"Good morning/afternoon. Today you will complete a questionnaire about your positive psychological resources such as hope, confidence, resilience, and optimism. This is not a test. There are no right or wrong answers. We want your honest opinions about your own feelings and beliefs.

The questionnaire will take about 6-8 minutes. Your responses will be kept completely confidential. Your teachers will not see your individual answers.

Please fill in the demographic information first, then read the instructions carefully before starting. Think about your own feelings and beliefs when responding. Answer all questions honestly. Raise your hand if you have questions.

You may begin now."

During administration: Monitor quietly, answer questions neutrally, give a 2-minute warning near the end.

After completion: "Please check that you have answered all 15 questions. Thank you for your participation."

STUDENT QUESTIONNAIRE

DEMOGRAPHIC INFORMATION

Student Identification Number or Name (Optional): _____

Class and Section: _____

School Name: _____

School Locale: ☐ Rural ☐ Urban

Gender: ☐ Male ☐ Female ☐ Other

Date: _____

INSTRUCTIONS FOR STUDENTS

Dear Student,

This questionnaire asks about your positive psychological resources such as hope, confidence, resilience, and optimism. Please read each statement carefully and mark the option that best describes your opinion. Think about your own feelings and beliefs when responding.

There are no right or wrong answers. Your honest responses will help us understand factors that contribute to student success. All responses are confidential.

Mark (✓) one option for each statement:

- **Strongly Agree** – You completely agree
- **Agree** – You agree
- **Neutral** – You neither agree nor disagree
- **Disagree** – You disagree
- **Strongly Disagree** – You completely disagree

Time: 6-8 minutes

QUESTIONNAIRE ITEMS

No.	Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	I usually expect the best, when result seems to me uncertain.					
2	If face failure, I work hard to get success.					

No.	Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
3	If something goes wrong for me, I try hard.					
4	Failures motivate me to go ahead without any break.					
5	Looking on the brighter side of everything concerning with my studies help me in achieving good result.					
6	I am strong believer of the fact that 'Hard work always pays'.					
7	I feel confident in participating in class discussion.					
8	I am very positive about my future.					
9	I am confident in finding the solution to any problem.					
10	I could think divergently to find the solution whenever any problem encounters.					
11	I feel every problem have solutions.					
12	I feel I enjoy good position in class.					
13	I never face difficulties in managing my works.					
14	I can think of many solutions for a given problem.					
15	I take that work only in which I feel, I can give my best.					

Please check that you have answered all 15 questions. Thank you!

SCORING INSTRUCTIONS

STEP 1: ASSIGN POINTS

For All Items (All 15 items are positively worded):

Response	Points
Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

STEP 2: CALCULATE TOTAL SCORE

- 1 Score all 15 items using the scoring key above
- 2 Add all 15 item scores together
- 3 **Total Score = Sum of all items**

Possible Score Range: 15 to 75

SCORING EXAMPLE

Example:

Item 1: "I usually expect the best, when result seems to me uncertain."

- Student marks: **Strongly Agree** → Score = **5 points**
- Student marks: **Agree** → Score = **4 points**
- Student marks: **Neutral** → Score = **3 points**
- Student marks: **Disagree** → Score = **2 points**
- Student marks: **Strongly Disagree** → Score = **1 point**

Sample Calculation:

If a student scores:

- Items 1-5: Strongly Agree (5 points each) = 25 points
- Items 6-10: Agree (4 points each) = 20 points

- Items 11-15: Neutral (3 points each) = 15 points

Total Score = 25 + 20 + 15 = 60 points (High Psychological Capital)

QUICK REFERENCE GUIDE

Administration Time: 6-8 minutes

Total Items: 15

Response Scale: 5-point Likert scale (Strongly Agree to Strongly Disagree)

Scoring:

- Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, Strongly Disagree = 1
- All items scored the same way (no reverse scoring)

Score Range: 15-75

Reliability: Cronbach's Alpha > 0.90

Note: This scale measures four dimensions of psychological capital:

- **Hope** (goal-directed thinking)
- **Efficacy** (confidence in abilities)
- **Resilience** (bouncing back from adversity)
- **Optimism** (positive expectations about the future)

END OF PSYCHOLOGICAL CAPITAL ASSESSMENT SCALE

STUDENT ENGAGEMENT SCALE

ADMINISTRATOR INSTRUCTIONS

Purpose: To measure students' behavioral, cognitive, and emotional engagement in learning

Number of Items: 12 items

Time Required: 5-7 minutes

Special Note: All items are positively worded. Higher scores indicate greater student engagement.

ADMINISTRATION SCRIPT

Say to students:

"Good morning/afternoon. Today you will complete a questionnaire about your engagement and involvement in learning activities. This is not a test. There are no right or wrong answers. We want your honest opinions about your typical behavior in school.

The questionnaire will take about 5-7 minutes. Your responses will be kept completely confidential. Your teachers will not see your individual answers.

Please fill in the demographic information first, then read the instructions carefully before starting. Think about your typical behavior in school when responding. Answer all questions honestly. Raise your hand if you have questions.

You may begin now."

During administration: Monitor quietly, answer questions neutrally, give a 2-minute warning near the end.

After completion: "Please check that you have answered all 12 questions. Thank you for your participation."

STUDENT QUESTIONNAIRE

DEMOGRAPHIC INFORMATION

Student Identification Number or Name (Optional): _____

Class and Section: _____

School Name: _____

School Locale: ☐ Rural ☐ Urban

Gender: ☐ Male ☐ Female ☐ Other

Date: _____

INSTRUCTIONS FOR STUDENTS

Dear Student,

This questionnaire asks about your engagement and involvement in learning activities. Please read each statement carefully and mark the option that best describes your opinion. Think about your typical behavior in school when responding.

There are no right or wrong answers. Your honest responses will help us understand factors that contribute to effective learning. All responses are confidential.

Mark (✓) one option for each statement:

- **Strongly Agree** – You completely agree
- **Agree** – You agree
- **Neutral** – You neither agree nor disagree
- **Disagree** – You disagree
- **Strongly Disagree** – You completely disagree

Time: 5-7 minutes

QUESTIONNAIRE ITEMS

No.	Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	I try my best to do in-depth study of a topic by identifying the key points.					
2	In order to understand important topics, I take examples from my daily life.					

No.	Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
3	I often try to associate learning material in one class with learning about similar things in other classes.					
4	I enjoy using online resources to explore more about topics.					
5	I feel interested in working to do new in the class.					
6	I feel excited while participating in various school activities.					
7	I enjoy healthy classroom interactions.					
8	I feel comfortable in sharing my problems with my teachers.					
9	I take active participation in question-answer session.					
10	I carefully listen to the viewpoints of my classmates on various topics in the class.					
11	When I don't understand a topic, I never hesitate in discussing it with my teacher.					
12	I give sufficient time to my homework.					

Please check that you have answered all 12 questions. Thank you!

SCORING INSTRUCTIONS

STEP 1: ASSIGN POINTS

For All Items (All 12 items are positively worded):

Response	Points
Strongly Agree	5
Agree	4
Neutral	3
Disagree	2
Strongly Disagree	1

STEP 2: CALCULATE TOTAL SCORE

- 1 Score all 12 items using the scoring key above
- 2 Add all 12 item scores together
- 3 **Total Score = Sum of all items**

Possible Score Range: 12 to 60

SCORING EXAMPLE

Example:

Item 1: "I try my best to do in-depth study of a topic by identifying the key points."

- Student marks: **Strongly Agree** → Score = **5 points**
- Student marks: **Agree** → Score = **4 points**
- Student marks: **Neutral** → Score = **3 points**
- Student marks: **Disagree** → Score = **2 points**
- Student marks: **Strongly Disagree** → Score = **1 point**

Sample Calculation:

If a student scores:

- Items 1-4: Strongly Agree (5 points each) = 20 points

- Items 5-8: Agree (4 points each) = 16 points
- Items 9-12: Agree (4 points each) = 16 points

Total Score = 20 + 16 + 16 = 52 points (High Engagement)

QUICK REFERENCE GUIDE

Administration Time: 5-7 minutes

Total Items: 12

Response Scale: 5-point Likert scale (Strongly Agree to Strongly Disagree)

Scoring:

- Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2, Strongly Disagree = 1
- All items scored the same way (no reverse scoring)

Score Range: 12-60

Reliability: Cronbach's Alpha > 0.90

Note: This scale measures three dimensions of student engagement:

- **Behavioral Engagement** (effort, persistence, participation)
- **Cognitive Engagement** (deep learning strategies, self-regulation)
- **Emotional Engagement** (interest, enjoyment, sense of belonging)

END OF STUDENT ENGAGEMENT SCALE

ENGLISH ACHIEVEMENT TEST

ADMINISTRATOR INSTRUCTIONS

Purpose: To measure students' achievement in English language across reading comprehension, vocabulary, and grammar

Number of Items: 30 multiple-choice questions

- Part A: Reading Comprehension (9 questions)
- Part B: Vocabulary (9 questions)
- Part C: Grammar (12 questions)

Time Required: 30 minutes

Special Note: This is an achievement test with correct and incorrect answers. An answer key is provided for scoring.

ADMINISTRATION SCRIPT

Say to students:

"Good morning/afternoon. Today you will take an English Achievement Test. This test has three parts: Reading Comprehension, Vocabulary, and Grammar. There are 30 questions in total.

You will have 30 minutes to complete the test. Read all instructions and questions carefully. Choose the most appropriate answer for each question and put a tick mark in the box beside your chosen option.

Do not use dictionaries, mobile phones, or any other aids. There is no negative marking for wrong answers, so attempt all questions even if you are not completely sure.

Please fill in the demographic information first. Are there any questions before we begin?

You may begin now."

During administration:

- Monitor quietly to prevent cheating
- Give time warnings at 15 minutes and 5 minutes remaining
- Do not answer questions about test content

After completion: "Please check that you have answered all 30 questions. Make sure your name and other details are filled in. You may submit your test paper now."

STUDENT TEST BOOKLET

DEMOGRAPHIC INFORMATION

Name: _____

Student Identification Number or Roll Number: _____

Class and Section: _____

School Name: _____

School Locale: ☐ Rural ☐ Urban

Gender: ☐ Male ☐ Female ☐ Other

Date: _____

GENERAL INSTRUCTIONS FOR STUDENTS

Dear Student,

This is a test to assess your achievement in English language. The test consists of three parts: Reading Comprehension, Vocabulary, and Grammar. There are **30 questions** in total, and each question carries **1 mark**.

Important Instructions:

- 1 Read each question carefully before selecting your answer
- 2 Choose the **most appropriate option** (a, b, c, or d) for each question
- 3 Put a **tick mark (✓)** in the box beside your selected option
- 4 Mark **only one option** per question
- 5 If you wish to change an answer, erase the previous mark completely and mark the new option
- 6 Do not use dictionaries, mobile phones, or any other aids
- 7 There is **no negative marking** for wrong answers

Total Marks: 30

Time Allowed: 30 minutes

All the best!

PART A: READING COMPREHENSION

Instructions: Please read the passage carefully and then answer the multiple-choice questions based on the information provided.

Questions: 1-9 (9 marks)

Passage:

West Bengal, like many other regions of India, is facing significant environmental challenges, exacerbated by climate change and population growth. Climate change has had a substantial impact on our lives, manifesting in rising temperatures, irregular rainfall patterns, and increasing sea levels. These issues adversely affect agriculture, public health, and biodiversity.

Deforestation is another major problem, leading to ecological imbalance. The reduction of forest areas results in the destruction of wildlife habitats and a decrease in biodiversity. Tree plantation and forest conservation can play crucial roles in addressing this issue.

Water pollution is also a serious concern. Industrial waste, household waste, and agricultural chemicals are contaminating rivers and water bodies. This pollution poses a severe threat to human health and aquatic life. Effective waste management and the implementation of stricter pollution control measures are essential to combat this issue.

Moreover, air pollution is becoming an increasing problem, particularly in urban areas. Emissions from vehicles, industries, and the burning of fossil fuels contribute to the degradation of air quality. Poor air quality can lead to respiratory diseases and other health problems, particularly among children and the elderly.

Soil erosion is yet another environmental issue that West Bengal faces. Unsustainable agricultural practices, deforestation, and heavy rainfall contribute to the loss of fertile topsoil. This can reduce agricultural productivity and lead to the siltation of rivers, exacerbating flooding.

Community awareness and participation are critical in addressing these environmental issues. Public education campaigns, stricter enforcement of environmental regulations, and community-driven conservation projects can all play a part in preserving West Bengal's natural resources for future generations.

1. What are the main factors contributing to water pollution in West Bengal?

- ☐ a. Rising temperatures and deforestation
- ☐ b. Irregular rainfall and climate change
- ☐ c. Industrial waste, household waste, and agricultural chemicals
- ☐ d. Tree plantation and forest conservation

2. According to the passage, how does climate change affect agriculture?

- ☐ a. By increasing biodiversity
- ☐ b. Through ecological imbalance
- ☐ c. By causing rising temperatures and irregular rainfall
- ☐ d. By promoting tree plantation

3. What measures are suggested to combat deforestation in the passage?

- ☐ a. Industrial development
- ☐ b. Climate change mitigation
- ☐ c. Waste management
- ☐ d. Tree plantation and forest conservation

4. Why is water pollution a serious concern as per the passage?

- ☐ a. It leads to deforestation
- ☐ b. It destroys biodiversity
- ☐ c. It poses a threat to human health and aquatic life
- ☐ d. It increases sea levels

5. Which of the following best describes the tone of the passage?

- ☐ a. Optimistic and hopeful
- ☐ b. Informative and concerned
- ☐ c. Indifferent and detached
- ☐ d. Critical and harsh

6. What is the writer's purpose in this passage?

- ☐ a. To entertain readers with stories of wildlife
- ☐ b. To inform readers about the environmental issues in West Bengal
- ☐ c. To persuade readers to avoid tree plantation
- ☐ d. To criticize industrial development

7. Which of the following statements is true based on the passage?

- ☐ a. Climate change only affects public health
- ☐ b. Deforestation helps in controlling water pollution
- ☐ c. Effective waste management can help combat water pollution

☐ d. Rising sea levels do not impact agriculture

8. How does air pollution primarily impact human health according to the passage?

- ☐ a. Causes water contamination
 - ☐ b. Leads to respiratory diseases
 - ☐ c. Promotes biodiversity
 - ☐ d. Increases agricultural productivity
-

9. Which practice is identified as contributing to soil erosion in West Bengal?

- ☐ a. Industrial development
 - ☐ b. Tree plantation
 - ☐ c. Unsustainable agricultural practices
 - ☐ d. Effective waste management
-

PART B: VOCABULARY

Instructions: Read the passage carefully and answer the following questions. Use contextual clues from the passage to infer the meanings of unfamiliar vocabulary.

Questions: 10-18 (9 marks)

Passage: The River and the Village

The small river flowed gently through the beautiful village, its clear waters providing a lifeline to the community. Villagers depended on the river for their daily needs, drawing water for drinking, cooking, and irrigation. The river also supported a variety of fish, which the villagers relied on for food and income. However, recent industrial developments upstream had started to pollute the river, threatening the villagers' way of life. The once pristine waters began to show signs of contamination, with an increasing presence of trash and chemical waste. Concerned about their future, the villagers organized a meeting to discuss the steps they could take to protect their precious resource. They considered various strategies, from petitioning the government to taking legal action against the polluting companies. The community knew that preserving the river was essential not just for their survival, but for the future generations that would call the village home.

10. In the passage, what does "providing a lifeline" mean?

- ☐ a. Offering a rescue

- ☐ b. Supplying vital support
 - ☐ c. Drawing water
 - ☐ d. Increasing pollution
-

11. What does the term "clear waters" suggest about the river?

- ☐ a. The water is muddy
 - ☐ b. The water is transparent
 - ☐ c. The water is deep
 - ☐ d. The water is scarce
-

12. What does "industrial developments" imply about the changes upstream?

- ☐ a. Agricultural activities
 - ☐ b. Construction of factories
 - ☐ c. Establishment of schools
 - ☐ d. Increase in wildlife
-

13. What does "threatening the villagers' way of life" mean?

- ☐ a. Improving their lifestyle
 - ☐ b. Endangering their existence
 - ☐ c. Changing their culture
 - ☐ d. Supporting their traditions
-

14. What does the word "precious" most likely mean in the context of the villagers' view of the river?

- ☐ a. Rare
 - ☐ b. Valuable
 - ☐ c. Ordinary
 - ☐ d. Unimportant
-

15. What can be inferred about the villagers' reliance on fish from the river?

- ☐ a. They do not eat fish
 - ☐ b. Fish are a major part of their diet and income
 - ☐ c. They only catch fish for sport
 - ☐ d. Fish are scarce in the river
-

16. What does the phrase "pristine waters" most likely mean?

- ☐ a. Polluted
 - ☐ b. Clean and unspoiled
 - ☐ c. Stagnant
 - ☐ d. Murky
-

17. What can be inferred about the villagers' attitude towards industrial developments?

- ☐ a. They support the developments
 - ☐ b. They are indifferent to the developments
 - ☐ c. They are concerned about the developments
 - ☐ d. They initiated the developments
-

18. What is the likely purpose of the villagers considering "various strategies" to protect the river?

- ☐ a. To abandon the village
 - ☐ b. To ensure the river's protection
 - ☐ c. To increase pollution
 - ☐ d. To sell the river
-

PART C: GRAMMAR

Instructions: Read each question carefully and select the best answer from the options provided.

Questions: 19-30 (12 marks)

19. Which of the following sentences demonstrates the correct usage of the present perfect tense?

- ☐ a. She goes to the gym every day
 - ☐ b. He has finished his homework already
 - ☐ c. They will visit the museum tomorrow
 - ☐ d. I am reading a book yesterday
-

20. In the sentence "The cat chased the mouse," what is the type of sentence structure?

- ☐ a. Simple
 - ☐ b. Compound
 - ☐ c. Complex
 - ☐ d. Compound-complex
-

21. Identify the clause in the following sentence: "Although it was raining, they went for a picnic."

- ☐ a. Although it was raining
 - ☐ b. they went for a picnic
 - ☐ c. it was raining
 - ☐ d. went for a picnic
-

22. Which of the following sentences demonstrates the correct usage of the passive voice?

- ☐ a. The chef cooks delicious meals every day
 - ☐ b. The cake was baked by Mary
 - ☐ c. She will complete the project tomorrow
 - ☐ d. They are playing football in the park
-

23. Choose the sentence that correctly uses a modal auxiliary based on semantic considerations.

- ☐ a. He must to finish his assignment
- ☐ b. She should to go to the doctor

- ☐ c. They might arrive late due to traffic
 - ☐ d. We would can help you with the move
-

24. Select the sentence with the correct usage of the past perfect tense.

- ☐ a. I will have finished my work by noon
 - ☐ b. She is going to the party tonight
 - ☐ c. They were studying when the power went out
 - ☐ d. He had eaten lunch before the meeting started
-

25. Which sentence is an example of a complex sentence?

- ☐ a. She dances well
 - ☐ b. They went to the market, and they bought fruits
 - ☐ c. Although it was raining, they went for a walk
 - ☐ d. He is tall, dark, and handsome
-

26. Identify the modal auxiliary in the sentence: "You should take your umbrella with you."

- ☐ a. You
 - ☐ b. should
 - ☐ c. take
 - ☐ d. with
-

27. Which of the following sentences uses the correct form of the verb in the conditional mood?

- ☐ a. If I was rich, I would travel the world
 - ☐ b. If I were rich, I would travel the world
 - ☐ c. If I am rich, I would travel the world
 - ☐ d. If I will be rich, I would travel the world
-

28. Which sentence correctly demonstrates the use of the passive voice in scientific writing?

- ☐ a. The scientist conducted the experiment carefully
 - ☐ b. The results of the experiment were analyzed by the research team
 - ☐ c. We will present our findings at the conference
 - ☐ d. They are discussing the latest research in the field
-

29. Choose the sentence that demonstrates the correct usage of modal auxiliaries in expressing possibility.

- ☐ a. She can to swim very fast
 - ☐ b. They might come to the party if they finish their work
 - ☐ c. He must goes to the doctor for a check-up
 - ☐ d. We will to leave early to catch the train
-

30. Choose the sentence that correctly demonstrates the use of modal auxiliaries in expressing obligation.

- ☐ a. He could finish his homework on time
 - ☐ b. You must complete the task by tomorrow
 - ☐ c. She should to visit her grandparents soon
 - ☐ d. They might go to the concert if they get tickets
-

Please check that you have answered all 30 questions before submitting your test.

ANSWER KEY (FOR ADMINISTRATORS ONLY)

Question	Correct Answer	Question	Correct Answer	Question	Correct Answer
1	c	11	b	21	a
2	c	12	b	22	b
3	d	13	b	23	c
4	c	14	b	24	d
5	b	15	b	25	c
6	b	16	b	26	b
7	c	17	c	27	b
8	b	18	b	28	b
9	c	19	b	29	b
10	b	20	a	30	b

SCORING INSTRUCTIONS

STEP 1: CHECK ANSWERS

- 8 Use the answer key provided above
 - 9 Compare each student's answer with the correct answer
 - 10 Mark each question as correct (✓) or incorrect (X)
-

STEP 2: CALCULATE TOTAL SCORE

- 11 Count the number of correct answers

- 12 **Total Score = Number of correct answers**
- 13 Each correct answer = 1 mark
- 14 No negative marking for incorrect answers

Possible Score Range: 0 to 30

STEP 3: CALCULATE PERCENTAGE

Percentage = (Total Score ÷ 30) × 100

Example:

- If a student scores 24 correct answers
- Percentage = $(24 \div 30) \times 100 = 80\%$

QUICK REFERENCE GUIDE

Administration Time: 30 minutes

Total Items: 30 multiple-choice questions

- Reading Comprehension: 9 questions
- Vocabulary: 9 questions
- Grammar: 12 questions

Scoring:

- Each correct answer = 1 mark
- No negative marking
- Total marks = 30

Reliability: Cronbach's Alpha > 0.90

END OF ENGLISH ACHIEVEMENT TEST

LIST OF PUBLICATIONS

Sl. No	Type of Paper	Name of the Journal/Conference/ Book	Journal indexing	Title of the Paper Published	Date/ Year
1	Journal Paper	Multidisciplinary Reviews	Scopus	Systematic review of classroom climate and its influence on English language achievement	2024
2	Journal paper	Journal of Educare (JoE)	UGC Care, Aliah University	Engaging Classrooms, Empowered Learners: Mediating Role Of Student Engagement Between Classroom Climate And English Achievement In Government-Sponsored Schools	2025
3	Journal paper	OEIL RESEARCH JOURNAL	Non-Scopus	Balancing Brevity and Validity: A Psychometric Refinement of the Student Engagement Scale for Educational Contexts	2025
4	Journal Paper	International Journal For Multidisciplinary Research	Non-Scopus	Conceptualizing Student Engagement through the Panchakosha Framework: A Holistic Theoretical Model for Secondary Education	2025
5	Journal Paper	International Journal of Evaluation and Research in Education (IJERE)	Scopus	Classroom climate and absenteeism: modeling English achievement mediated by engagement	2025
6	Book	How To Manage Your ESL Classroom To Make It More Engaging	Non-Scopus	How To Manage Your ESL Classroom To Make It More Engaging (Full Book with ISBN-9698317482664)	2025
7	Journal Paper	International Journal of Innovative Science	Non-Scopus	Modelling the Latent Dynamics of Digital	2026

Sl. No	Type of Paper	Name of the Journal/Conference/ Book	Journal indexing	Title of the Paper Published	Date/ Year
		and Research Technology ISSN No: -2456-2165		Device Use, Parental Involvement, Psychological Capital and English Achievement: A Bayesian Finite Mixture Structural Modelling Approach with Data-Driven Class Enumeration	
8	Journal Paper (under review)	Journal of Interdisciplinary Studies in Education Special Issue on AI and Digital Teaching Methods in Language Education	Scopus	Evaluating the Impact of AI-Based Classroom Planning on Classroom Climate and ESL Achievement: An Experimental Study with Student Engagement as a Mediating Variable	2026 (under review)
9	Journal Paper (under review)	Journal of Education and Learning (EduLearn)	Scopus	Confirmatory Network Analysis of English Achievement: Classroom Climate, Parental Involvement, Psychological Capital, and Student Engagement	2026 (under review)

LIST OF PRESENTATIONS

Sl. No	Type of Paper	Name of the Journal/Conference/ Book	Journal indexing	Title of the Paper Published	Date/ Year
1	Conference Proceedings	Diversity, Psycho-social Aspects, and Empowerment: Gender Perspective through an Interdisciplinary Lens	Non-Scopus	An Analysis of Psychological Capital Among Secondary School Students in West Bengal: Examining Hope, Efficacy, Resilience, and Optimism	2024
2	Conference proceedings	ICSSR Sponsored National Seminar held at Khalsa College of Education, Ranjit Avenue, Amritsar, on 21st March 2025	Non-Scopus	Integrating Inquiry-Based Learning and Parental Involvement: Lessons from Rishi Varuna and Bhrgu for Enhancing Student Engagement in ESL Classrooms	2025
3	Conference proceedings	INDO-BHUTAN SOCIAL SCIENCE CONFERENCE “Envisioning the Future: Interdisciplinary Approaches to resilience, inclusion, sustainability, Social Transformation and saving the planet”	Non-Scopus	Fostering Resilience and Equity: A Mixed Methods Study of a Classroom-Based Intervention to Enhance Psychological Capital and Engagement by Reducing Absenteeism among At-Risk Secondary Students in West Bengal	2025
4	Conference proceedings	Two-day International Seminar on Education in 21st Century: Technology Integration, Sustainability, and Inclusiveness	Non-Scopus	The Interplay of Digital Device Use, Parental Involvement, and Psychological Capital on ESL Achievement in Marginalized Communities of West Bengal	2025
5	Conference	ICSSR-sponsored two-	Non-	Assessing Student	2025

	proceedings	day national seminar on ‘AI and Related Technologies in Education: Cutting Edge Issues’, organized by the Department of Education, Bankura University.	Scopus	Engagement in Secondary Schools: Current Trends and Potential Role of Artificial Intelligence	
6	Conference proceedings	International Seminar on Gender Fluidity and Non-Binary Identities in Society, organized by the North Bengal University.	Non-Scopus	Psychological Capital as a Mediator between Gender Identity Expression and English Achievement Among Secondary School Students.	2025
7	Conference proceedings	Two-Day International Symposium on Education 5.0: Expected Roles of Teachers & Learners Organized by: Department of Education, School of Education, Netaji Subhas Open University	Non-Scopus	Integrated AI Solutions for Fostering Joyful Learning, Enhancing Engagement, and Mitigating Absenteeism in Secondary ESL Contexts	2025
8	Conference proceedings	National Seminar on Innovative Pedagogy: Opportunities and Challenges organized by Department of Education University of Allahabad, Prayagraj	Non-Scopus	Small Loops, Big Gains: An AI-Supported Formative Micro-Intervention to Boost Engagement in Class VIII ESL Learning—A Quasi-Experimental Study	2025
9	Conference proceedings	International Conference On Educational Technology And Global Sustainability (Icetgs-2026)	Non-Scopus	AI-Based Classroom Planning: Enhancing ESL Achievement Through Structured Classroom Climate and Student Engagement	2026

PLAGIARISM CHECK REPORT

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Yu Sun, Qian Liu, Xiaona Liu. "The Impact of Career Planning and Self-Concept on Employability among University Students: Exploring the Mediating Role of Learning

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