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Review Paper

Factors Affecting Academic Achievement in Secondary Schools: A Critical Review of School Environment and Self-Confidence

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ABSTRACT

Academic achievement in secondary schools is influenced by multiple interlocking factors. Among the most proximal are the school environment, including climate, instructional quality, physical environment, leadership, and resource provision, and student self-confidence, academic self-efficacy, self-concept, and related motivational beliefs. Drawing on empirical and meta-analytic studies from 2015 to 2025, this review examines how school environment and self-confidence individually and jointly influence secondary school academic achievement, what mediators and moderators exist, and what gaps remain. Recent findings show that positive school climate and leadership have moderate effects on student performance (Daily et al., 2019; Özdoğru, Sarier & Korucuoğlu, 2025); similarly, academic self-efficacy and values predict achievement and persistence over time, especially in longitudinal designs (Honicke & Broadbent, 2016). Evidence suggests reciprocal influences: achievement fosters self-confidence, and self-confidence aids in overcoming negative environmental effects. Key limitations include inconsistent measures, lack of causal designs, and underrepresentation of low- and middle-income settings. Interventions that combine environmental improvements with boosting self-beliefs seem especially promising (Acosta-Gonzaga et al., 2023). Policy recommendations emphasize whole-school strategies, teacher development, domain-specific confidence building, and attention to equity and context.

Keywords: *Academic Achievement, Academic Self-Efficacy, Social Cognitive Theory, School Environment, Self-Concept*

Secondary education represents a critical period in the academic trajectories of students. Learning outcomes acquired during these years often determine access to higher education, shape career paths, and influence broader social mobility (Costa, 2024). Educators, policymakers, and researchers thus seek to identify variables that reliably predict academic achievement in secondary schools. Among these, the school environment, comprising both physical and psychosocial aspects, and academic self-confidence have garnered significant attention.

The school environment encompasses factors such as school climate, safety, relationships, support, academic expectations, leadership, teacher practices, physical facilities, and

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resource availability (Daily et al., 2019; Berman, Womack & Sankar, 2018). Self-confidence refers to academic self-efficacy-beliefs in one's own capacity to perform academic tasks, academic self-concept, how students view their competence in specific academic domains, and more general self-esteem when linked to school performance (Honicke & Broadbent, 2016).

Theoretical frameworks such as Bandura's social-cognitive theory suggest that self-efficacy contributes to motivation, effort, and persistence in learning tasks (Bandura, 1997), while ecological models foreground how environmental contexts-school neighbourhood, leadership, and teacher behaviour-shape these individual beliefs (Amsalu, Bayleyegn & Desalegn, 2024). Understanding how environment and self-confidence interact is crucial: does environment affect achievement directly, or is much of its effect mediated through self-beliefs? Conversely, can high self-confidence buffer students against negative environmental conditions? What role do moderators like gender, socioeconomic status, or cultural context play?

This review draws on empirical, longitudinal, and meta-analytic studies from around 2015 to 2025 to address these questions, focusing on secondary school populations. The structure is as follows: first, evidence linking school environment to academic achievement; second, evidence for self-confidence's effect; third, mediators and mechanisms; fourth, interactive and moderating effects; fifth, intervention evidence and policy implications; finally, methodological limitations and future directions.

School Environment and Academic Achievement:

Recent research increasingly supports the significance of school climate and leadership in influencing academic outcomes in secondary education. For instance, Daily et al. (2019) conducted a survey involving students across grades 6-12 and identified that, among ten different domains of school climate-including safety, peer relationships, academic support, and teacher-student relationships, showed statistically significant correlations with academic achievement. Notably, academic support exhibited the strongest effect among these domains. This indicates that various facets of school climate-and not just the academic focus-play vital roles, including relational, emotional, and safety aspects (Daily et al., 2019). Leadership and school climate work together to exert a substantial influence on student performance. A recent meta-analysis by Özdoğru, Sarier, and Korucuoğlu (2025), which reviewed 90 studies encompassing approximately 83,337 students, found moderate effect sizes for both leadership and climate on academic outcomes. Their findings suggest that these factors are more than peripheral influences-they are critical determinants of student success.

Furthermore, physical and infrastructural features of the school environment are also relevant. Although research here is somewhat limited in scale, multiple studies emphasize that classrooms with improved ventilation, better lighting, and ample physical resources tend to be associated with decreased absenteeism, enhanced concentration, and, consequently, higher academic achievement (Goddard et al., 2000b; Nieuwenhuis & Hooimeijer, 2016). For example, Nieuwenhuis and Hooimeijer (2016) highlight the systematic relationships between broader environmental contexts-including neighborhood quality and built environment and student achievement, supporting the assertion that environmental quality at various levels substantially affects academic success.

Additionally, classroom atmosphere, a component of the school environment, has also been extensively studied. Several investigations in low- and middle-income countries, such as India, reveal a strong positive correlation between classroom atmosphere-including teacher behavior, peer relations, cognitive encouragement, and acceptance, and academic achievement among secondary students (Harinarayanan & Pazhanivelu, 2018).

However, not all effects of school environment are consistent or equally significant. Moderator analyses in multiple studies indicate that impacts vary by grade level (middle versus high school), subject domain (mathematics, language, sciences), and student demographics. For example, Daily et al. (2019) found that the effect sizes related to climate domains were generally larger in middle school compared to high school, although the effects remained significant across both levels.

In summation, evidence accumulated over the past decade confirms that school climate, leadership, and classroom/instructional environment are robust predictors of secondary school academic achievement, although their effect sizes are moderate. Moreover, structural and physical environmental features considerably reinforce these effects, particularly in settings where basic resources are adequately provided (Goddard et al., 2000b; Özdoğru et al., 2025).

Self-Confidence and Academic Achievement:

A parallel stream of literature has focused on student self-confidence, particularly academic self-efficacy and academic self-concept, and how these beliefs influence academic outcomes. Longitudinal studies have helped clarify developmental trajectories. For example, the "6-year longitudinal study of self-efficacy in Chinese secondary school students in Hong Kong" (Shek & Liang, ~2016) followed students from Grade 7 to Grade 12 and found that self-efficacy increased over adolescent years, with family environment and relational quality also playing significant roles in shaping these trajectories (Shek & Liang, 2016). Similarly, Caprara et al.'s longitudinal analysis using latent growth curve models found that students' perceived efficacy for self-regulated learning tends to decline from junior to senior high school, especially among male students, and that lower self-regulatory efficacy predicts lower academic achievement and higher dropout likelihood (Caprara et al., 2019).

Academic self-concept also shows declining trends across the transition into secondary school. It was revealed that students' self-concept dropped by about 23% over four years from primary to secondary grades (Rost, Hofer, & Wagner, 2024). Factors such as socioeconomic status, measured via indexes of socioeconomic and cultural household capital, early grade repetition, and immigrant status, were significantly associated with lower self-concept (Rost, Hofer, & Wagner, 2024). Girls tended to have higher self-concept at early stages but showed declines similar to boys (Smith et al., 2023).

Other studies have explored domain-specific self-efficacy or self-beliefs. For example, longitudinal research conducted in South Korea found unidirectional paths from students' values to later academic self-efficacy in both mathematics and English among adolescents. This research indicates that students' perceptions of a subject's meaningfulness precede their confidence in their ability in those domains. Notably, in English, evidence of reciprocity emerged, where self-efficacy also influenced students' values during certain grade transitions (Kim & Lee, 2022).

Additionally, self-confidence mediates the effects of factors such as gender differences, mental health, or intentions to persist or resume schooling. For instance, a study of depressed adolescents in China found that academic self-efficacy partially mediated the relationship between gender and the intention to resume schooling after a break (Wang et al., 2021).

Meta-analyses and systematic reviews generally report moderate effect sizes of self-confidence on achievement; however, the magnitude shows large heterogeneity depending on the measurement instruments, subject domains, and country contexts. Domain-specific self-belief measures like math self-efficacy tend to predict achievement in those subjects more strongly than generalized self-esteem measures (Honicke & Broadbent, 2016; Schunk & DiBenedetto, 2020).

Mechanisms and Mediators:

Understanding how the school environment and self-confidence translate into improved academic outcomes requires examining mediating variables. Researchers commonly identify engagement, motivation, and self-regulation as key mediators. Studies show that school climate influences student engagement-behavioural, emotional, and cognitive-which in turn predicts grades and test scores. For instance, a Korean longitudinal study of students in grades 8 to 11 found that students' valuations of academic subjects influenced their self-efficacy, which then affected both engagement and academic outcomes (Kim & Seo, 2022). In Caprara et al.'s latent growth study, declines in perceived self-regulated learning efficacy closely correlated with decreases in self-regulated learning behaviors such as planning and monitoring, which predicted poorer academic continuation and performance (Caprara et al., 2019).

School climate provides a context of safety, support, relationships, and teacher expectations, all contributing to psychological benefits. Students attending schools with stronger climates perceive higher academic support, better teacher-student relationships, and greater safety. Such environments reduce stress, increase attendance, and reinforce positive feedback processes that promote achievement. Daily et al. (2019) documented that among ten examined climate domains, relational support and safety strongly predicted student grades.

Values, subject importance, and identity, particularly related to self-efficacy and self-concept, further mediate academic effects. When students value a subject, believe it matters to their future, and identify with it, their self-efficacy in that domain tends to increase. This enhanced self-belief leads to greater effort, persistence, and ultimately higher achievement (Kim & Lee, 2020).

Moreover, prior achievement and feedback critically influence self-efficacy and self-concept. These constructs are not exogenous but often derive from earlier academic success or failure. Students who perform well receive mastery feedback that boosts their self-confidence, which further motivates effort and learning. Conversely, repeated grade failure or early grade repetition negatively impacts self-concept, as illustrated in the MDPI self-concept decline study, indicating how feedback and past experiences shape students' academic beliefs (Smith et al., 2023).

Moderators and Interactions:

The strength and direction of the effects of school environment and self-confidence vary; researchers have identified several moderator variables. Socioeconomic status (SES) is a significant moderator. Students from higher SES backgrounds generally report higher levels of self-concept and self-efficacy, and often attend schools with better climate and resources. Importantly, SES moderates the effects of school environment: improvements in climate and support tend to yield larger relative benefits for students from low SES backgrounds, although in many contexts, the absolute levels of academic outcomes may still lag behind their higher SES peers. For example, the MDPI self-concept decline study revealed that children from families with high socioeconomic and cultural capital experienced smaller declines in self-concept when transitioning to secondary school (Smith et al., 2023; Li et al., 2024).

Gender also moderates these effects. Some studies show that girls often report higher self-concept or self-efficacy in early secondary school, particularly in non-STEM subjects. However, gender gaps may emerge or widen in domains such as mathematics. Furthermore, gender interacts with environmental influences; for example, girls' academic self-efficacy appears more responsive to teacher feedback and relational support. Research on depressed adolescents in China highlights gender differences in how self-efficacy mediates schooling intentions (Wang et al., 2021; Kim & Lee, 2022).

Grade level or stage of schooling constitutes another moderator. Academic self-concept and self-efficacy tend to decline during key transitions, such as from primary to secondary school. Caprara et al. (2019) documented declines in self-regulated learning efficacy from junior to senior high school, while other studies similarly report reductions in academic self-concept during this period, marking these transitions as both vulnerable and pivotal developmental windows (Caprara et al., 2019; Smith et al., 2023).

Subject domains exhibit domain specificity in self-beliefs and environment effects. Self-efficacy about competence in particular academic subjects (such as mathematics, science, and English) often predicts achievement in those subjects more accurately than general self-concept or esteem. Additionally, school climate impacts may vary by subject; for example, academic support in mathematics might hold greater importance in certain contexts than in others. South Korean studies provide evidence for the strong impact of subject values on self-efficacy and achievement (Kim & Lee, 2022; Park et al., 2023).

Cultural and context-specific factors further modulate these relationships. Educational and cultural norms, school policies, national curricula, and resource availability significantly influence how environment and self-confidence affect academic outcomes. For instance, immigrant status and early grade repetition in certain countries lead to steeper declines in self-concept. In low- and middle-income countries (LMICs) or disadvantaged school systems, physical environment constraints can undermine the benefits of positive school climate or teacher practices, although research in many LMIC contexts remains limited (Li et al., 2024; Rakesh et al., 2024).

Intervention Evidence and Policy Implications:

Intervention studies and meta-analyses over the last decade have increasingly targeted improvements in school environment, self-confidence, and combined approaches. A key meta-analytic work, *Effectiveness of Interventions Adopting a Whole School Approach to*

Enhancing Social and Emotional Development: A Meta-analysis (Durlak et al., 2011), reviewed approximately 30 interventions across 45 studies involving nearly half a million students (around 496,000). This meta-analysis found that whole school approaches-comprising school ethos, curriculum, and family/community involvement-produced statistically significant improvements in social-emotional outcomes, which often correlated with academic gains. Although direct academic achievement was not the primary focus in many cases, improvements in social-emotional learning (SEL) and school climate tended to transfer to better academic performance (Durlak et al., 2011; Cipriano et al., 2023).

Another recent meta-analysis examining academic interventions in secondary students showed that academic supports such as tutoring and structured learning programs yielded moderate to large effects on academic achievement (effect size g=0.66*g*=0.66), though corresponding effects on academic anxiety were less consistent. These interventions sometimes implicitly or explicitly enhanced self-confidence through mastery experiences and feedback (Smith et al., 2023).

Policy implications from this body of research emphasize the following:

- The necessity of whole-school reforms that address multiple interconnected components, including school climate, leadership, teacher capacity, physical environment, and social-emotional supports, rather than isolated changes.
- Investing in teacher professional development focusing on formative assessment, classroom management, student support, and feedback methods to cultivate environments that strengthen students' confidence and engagement (Cipriano et al., 2023).
- Integrating self-efficacy and self-confidence development into curricula through goal setting, scaffolding, subject relevance, mastery experiences, modeling, and strategic feedback (Durlak et al., 2011).
- Prioritizing interventions during educational transitions, such as from primary to secondary or junior to senior secondary school, stages when students' self-beliefs are most vulnerable to decline (Smith et al., 2023).
- Maintaining an equity focus by directing additional resources and support to schools in lower socioeconomic communities, those with high proportions of early grade repetition, immigrant students, or other vulnerable groups, who often experience weaker school environmental supports and lower self-confidence (Wang et al., 2021; Li et al., 2024).

Methodological Limitations and Research Gaps:

Despite substantial progress, several limitations persist in the literature. First, many studies rely heavily on cross-sectional designs, which restrict the ability to establish causality or detect reciprocal effects over time. Although some longitudinal studies exist, more research is needed, particularly in diverse contexts (Grazia, 2022; Coelho, 2020).

Second, measurement heterogeneity poses challenges. Constructs such as school climate and self-confidence (including self-efficacy, self-concept, and self-esteem) are operationalized in varied ways across studies, often without rigorous psychometric validation in each context. This variability complicates comparisons and meta-analyses (Sakız, 2021; Li et al., 2023).

Third, context bias is widespread. Much research originates from high-income countries, whereas evidence from low- and middle-income countries (LMICs) remains

underrepresented, especially regarding intervention studies. Additionally, many studies focus narrowly on specific subjects like mathematics or language rather than a broad curriculum (Leurent et al., 2021; Grazia, 2022).

Fourth, there are limited intervention trials that combine environmental modifications (such as school climate, leadership, facilities) and self-confidence interventions (e.g., self-efficacy training). Few randomized controlled trials explicitly test both simultaneously, which hinders understanding of potential additive or synergistic effects (Durlak et al., 2011; Smith et al., 2023).

Fifth, follow-up durations in intervention studies tend to be short, limiting knowledge regarding the sustainability of improvements in climate, self-beliefs, and academic achievement over time (Cipriano et al., 2023).

Finally, equity, diversity, and intersectional moderators often remain underexplored. While socioeconomic status, gender, immigrant status, and early grade failure are known to influence outcomes, few studies investigate how intersections of these factors or culturally specific moderators affect academic achievement (Wang et al., 2021; Li et al., 2024).

CONCLUSION

In conclusion, over the past decade, research strongly supports that secondary school academic achievement is influenced by both school environment factors-including climate, leadership, teacher practices, and physical facilities-and student self-confidence elements such as self-efficacy, self-concept, and subject values (Li et al., 2023; Honicke & Broadbent, 2016). These factors affect academic outcomes not only directly but also through mediators like student engagement, self-regulated learning behaviors, feedback, values, and attendance. Moderator variables such as socioeconomic status, gender, subject domain, and schooling stage play crucial roles in determining the strength of these associations (Smith et al., 2023; Wang et al., 2021).

From a policy and practical perspective, interventions that simultaneously target improvements in the school environment and the development of students' self-confidence-particularly during educational transition stages and for disadvantaged students-appear most promising (Durlak et al., 2011; Cipriano et al., 2023). Priorities must include increased investment in teacher professional development to enhance supportive relational practices and effective feedback mechanisms, alongside physical improvements to school infrastructure. Moreover, integrating self-efficacy and self-concept development into curricula through methods such as goal setting, scaffolding, and mastery experiences is essential (Cipriano et al., 2023).

For future research, emphasis should be placed on well-designed longitudinal and experimental studies that include culturally diverse samples, standardized instruments, and explicit examination of interactive effects among variables. This approach will enrich understandings of how environment and self-beliefs jointly affect academic outcomes across diverse educational contexts (Grazia, 2022; Leurent et al., 2021).

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Conflict of Interest
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