EJSIT
European Journal of Science, Innovation and Technology
ISSN: 2786-4936
www.ejsit-journal.com
Volume 5 | Number 4 | 2025

Investigating the Multi-Faceted Influences on Academic Outcomes in Early Schooling: Primary Years

Aishah Khan
International School, Saudi Arabia

ABSTRACT

Academic outcomes in early childhood are shaped by a complex interaction of factors, yet much of the existing literature approaches these influences in isolation—focusing separately on individual traits, family background, or school quality. This fragmented approach creates a gap in understanding how these forces interact dynamically in the formative years of education. This paper addresses that gap by adopting an ecological, systems-based perspective to explore the multifaceted nature of early academic development.

Drawing on Bronfenbrenner's Ecological Systems Theory, the review critically synthesises evidence from studies related to cognitive traits, socio-emotional skills, parenting practices, school climate, peer relationships, and community conditions. Each layer of influence—ranging from the child's immediate behavioural patterns to broader societal structures—is evaluated for its individual contribution and its interdependence with other domains. The literature review moves beyond descriptive summaries by identifying methodological limitations, contradictions across findings, and gaps in sample diversity.

The discussion section reframes academic performance as the outcome of interacting systems rather than isolated variables. It also highlights the mediating and moderating pathways through which risk and resilience operate. Based on these findings, the paper proposes practical strategies for educators, school leaders, and policymakers, while also outlining feasible implementation pathways. Finally, recommendations for future research emphasise the need for longitudinal and inclusive studies to address persistent equity gaps and develop more context-sensitive educational policies.

Keywords: Academic outcomes, Early schooling, Primary years, Multi-faceted influences, Educational achievement

1. INTRODUCTION

Understanding the factors that influence academic achievement in early primary education is essential for improving educational outcomes and reducing systemic disparities. Numerous studies have examined the roles of cognitive ability, socio-emotional development, parenting style, teacher-student relationships, and school-level policies. However, much of this research remains fragmented, with each factor often explored in isolation. This piecemeal approach fails to capture the complex, interdependent systems that shape children's academic trajectories [1].

The core problem this paper addresses is the lack of an integrated, ecological understanding of how these diverse influences operate in combination. In particular, there is a critical need to examine not just individual or family-level predictors, but how school, peer, and community environments interact with these personal factors to shape early academic development [2]. Without such a holistic perspective, interventions risk being narrowly targeted and less effective, especially for children in under-resourced or high-risk settings.

To address this gap, the present paper adopts Bronfenbrenner's Ecological Systems Theory as a conceptual lens for critically reviewing the multi-layered influences on academic outcomes in primary school-aged children. This framework enables the identification of both

direct and indirect pathways through which development is shaped, including mediating and moderating effects across individual, familial, and societal levels [3].

Research Questions:

- How do individual, familial, educational, and community factors interact to influence academic outcomes in early primary education?
- What critical gaps, methodological limitations, or overlooked intersections exist in the current literature, and how can these inform future research and practice?

2. LITERATURE REVIEW

A scrutiny of the domains that encompass several interconnected realms is compulsory to comprehend the determinants on which academic results in early schooling depend. Past research has analysed in depth the ways that both individual characteristics of a child, relationships between parental and a child, early educational experiences, and the community in large have an impact on a child's academic performance [4]. This part examines the available literature from these areas in order to gain comprehensive understanding about what they did with the primary years.

2.1 Individual and Behavioural Factors

Children's cognitive traits, self-regulation, and emotional behaviours significantly shape their capacity to adapt and thrive in primary school environments [5]. Research consistently links behavioural challenges such as inattention, hyperactivity, and impulsivity to later academic underperformance. These findings, however, often rely on parent or teacher observations, which may introduce subjective bias and reduce measurement precision.

Executive functions like working memory, attention control, and cognitive flexibility have been identified as strong predictors of academic success. Intervention studies targeting these skills demonstrate promising outcomes, particularly in early mathematics and literacy. Yet, the generalizability of such results is limited by narrow participant samples and short intervention durations. Moreover, few studies explore how these cognitive skills interact with social-emotional factors in real classroom contexts [6].

Temperament, including levels of reactivity and adaptability, also plays a critical role in shaping classroom behaviour and student-teacher relationships [7]. While some findings highlight the importance of "goodness-of-fit" between children's temperaments and teaching styles, these studies often rely on cross-sectional data, making it difficult to draw firm conclusions about developmental trajectories. Additionally, many overlook how structural supports such as classroom routines or individualised instruction might buffer the risks associated with difficult temperaments.

Synthesis Insight:

While individual traits clearly influence academic pathways, most current research treats them as static, isolated variables [8], [9]. There is a need for studies that examine how behavioural and cognitive profiles evolve over time and how they are shaped by continuous interactions with teachers, peers, and home environments. Future research should incorporate longitudinal tracking and observational studies to better capture how behavioural tendencies interact with evolving home and classroom environments over time [10].

These traits do not operate in a vacuum; their expression and impact are often shaped by family routines, teacher expectations, and classroom structure [11], [12]. Understanding individual behaviour in isolation risks overlooking the ways in which the environment amplifies or mitigates its effects.

2.2 Family and Parenting Influences

The home environment plays a foundational role in shaping children's academic trajectories. Parenting behaviours, family routines, emotional climate, and expectations around learning all influence school readiness and long-term achievement [13]. While studies consistently link parental involvement to positive educational outcomes, the nature and quality of this involvement vary widely and are often shaped by socioeconomic and cultural factors.

Research highlights that supportive parenting characterised by warmth, responsiveness, and consistent discipline promotes cognitive development and self-regulation. However, many studies conflate involvement with quantity of engagement, rather than examining the content and context of parental interactions. This creates gaps in understanding how different types of support such as reading aloud, discussing emotions, or supervising homework differentially affect learning outcomes [14].

Parental education level and socioeconomic status are also repeatedly associated with children's academic success, but these findings risk oversimplification. Socioeconomic status influences access to resources, time availability, and stress levels, which in turn shape parenting behaviours [15]. Few studies critically unpack how these indirect pathways operate, or how families from lower-income backgrounds may compensate through other strengths like communal support or religious engagement.

Moreover, existing research tends to underrepresent diverse family structures and cultural contexts [16]. There is limited exploration of how extended family dynamics, intergenerational caregiving, or language brokering among immigrant families impact early academic engagement [17]. Without acknowledging these nuances, many studies perpetuate deficit-based narratives and fail to inform inclusive educational practices.

Synthesis Insight:

While the influence of family and parenting on early learning is widely acknowledged, there remains a pressing need for research that accounts for cultural variation, indirect effects of poverty, and the specific mechanisms through which home environments shape learning—not just whether involvement occurs. Without acknowledging these nuances, many studies perpetuate deficit-based narratives and fail to inform inclusive educational practices [18]. There is a need for ethnographic approaches, mixed-method studies, and culturally grounded surveys to better understand how different parenting styles operate across diverse sociocultural settings [19].

Parenting practices are not solely a function of household dynamics—they are shaped by socioeconomic context, community stressors, and school-level engagement [20]. Family influence, therefore, should be understood as both a driver of development and a mediator of broader systemic conditions.

2.3 School and Teacher-Related Factors

The school environment plays a central role in shaping students' academic engagement, sense of belonging, and long-term achievement [21]. Classroom structure, teacher expectations, instructional methods, and emotional climate all contribute significantly to a child's academic experience [22]. While much research affirms the importance of effective teaching practices, many studies focus narrowly on outcomes like test scores, often neglecting the broader psychological and relational dimensions of learning [23].

Positive teacher-student relationships are repeatedly linked to improved behavioural outcomes, increased motivation, and better academic performance. However, many studies are correlational, limiting claims about causality. In addition, few account for how relational dynamics shift across developmental stages or how they may be influenced by factors such as teacher bias, class size, or institutional pressures [24].

Figure 1 illustrates three core psychological components: behaviour, motivational level, and attitude that influence academic engagement. **Behaviour** refers to self-regulation, task persistence, and classroom conduct; **Motivational level** reflects a child's drive to achieve and belief in their academic ability; and **Attitude** captures their general disposition toward learning, including curiosity and resilience. These variables interact to shape a child's consistency, effort, and responsiveness in classroom settings.

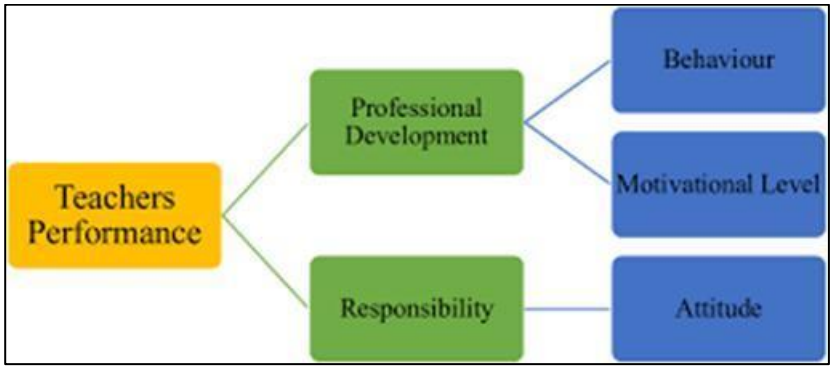

Figure 1: Factors affecting Teachers

Instructional quality and teacher expectations also influence student success, particularly in literacy and numeracy. Yet, much of the research assumes a one-size-fits-all approach, offering limited insight into how culturally responsive pedagogy or differentiated instruction affects diverse learners. Studies tend to underexplore how teaching methods intersect with students' linguistic backgrounds, learning profiles, or socio-emotional needs [25].

The physical school environment such as noise levels, seating arrangements, and access to resources has also been shown to influence cognitive focus and emotional regulation. However, these structural aspects are often treated as secondary, despite their significant impact on children with neurodivergent profiles or attention-related challenges [26].

Synthesis Insight:

Although the school environment is widely acknowledged as a key influence on academic success, research often isolates factors instead of examining their cumulative or interacting effects. Future studies should explore how instructional quality, teacher relationships, and environmental design work together to shape academic resilience across different learner profiles. Future studies should apply classroom-based interventions, teacher journaling, and video ethnography to explore how teaching quality and school culture shape academic resilience under real-world conditions [27].

School environments interact continuously with home life and peer dynamics [28]. For example, a supportive teacher-student relationship may buffer the negative effects of household instability or peer rejection, highlighting the school's role as a site of both academic instruction and emotional regulation [29].

2.4 Early School Entry and Developmental Timing

Peer interactions during early schooling significantly shape both academic outcomes and socio-emotional development. Positive peer relationships can enhance engagement, promote collaboration, and foster a sense of belonging. Conversely, peer rejection, bullying, or exclusion can contribute to school avoidance, reduced motivation, and emotional distress. Despite widespread acknowledgment of these dynamics, many studies treat peer influence as a static variable, failing to capture the fluid and reciprocal nature of social relationships in primary school settings [30].

Research exploring peer acceptance often relies on teacher or student reports, which are limited by perception bias and inconsistent criteria for social status. Furthermore, studies rarely examine how peer influence interacts with other factors, such as classroom norms, teacher management styles, or home-based socialisation practices. For example, the extent to which inclusive classroom strategies buffer the effects of peer conflict remains underexplored [31].

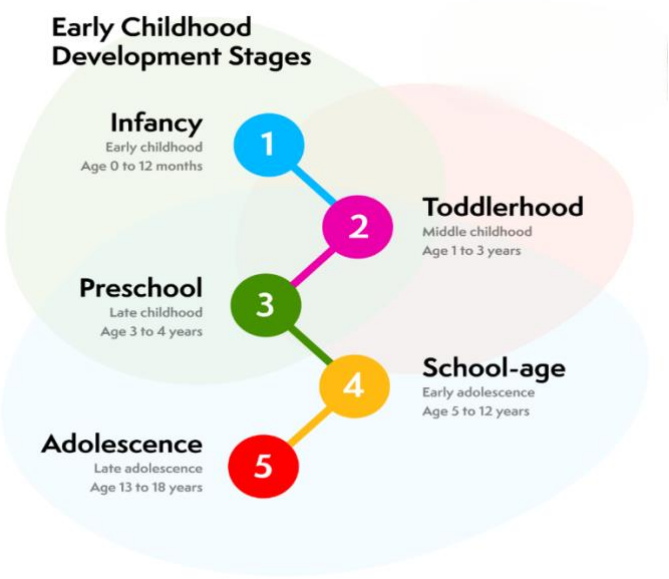

Figure 2: Stages of Child Development

Figure 2 underscores the importance of developmental timing by mapping how various environmental systems influence academic readiness at different life stages. This visual reinforces the ecological perspective by illustrating when and where different factors such as family, school, and peer groups exert their strongest influence on learning outcomes.

Gender and cultural norms also shape how peer dynamics unfold, yet many studies focus predominantly on Western, individualistic contexts, ignoring variations in collectivist cultures where group cohesion may be emphasised over competition. Moreover, most research overlooks the role of digital peer interactions—especially relevant as children increasingly communicate and form relationships online, even in the early years.

Synthesis Insight:

The influence of peers on academic and emotional outcomes is undeniable, but current research often fails to examine the contextual and reciprocal nature of these relationships. Future studies should adopt longitudinal and culturally diverse approaches to explore how peer dynamics evolve and how school structures can mediate their impact. To deepen understanding, researchers should consider social network analysis, behavioural mapping, and teacher-reported interaction scales to trace peer dynamics across time and context.

Peer acceptance and conflict are also shaped by the emotional competencies developed at home and the behavioural norms promoted by teachers. Thus, peer dynamics reflect not just social tendencies but the ripple effects of family, school, and cultural systems.

2.5 Literacy and Foundational Skills

Beyond the family and school, broader community and societal factors play a significant role in shaping academic outcomes during early childhood. Access to safe neighbourhoods, quality childcare, libraries, after-school programs, and community support networks can either enhance or limit educational opportunities [32]. While research often acknowledges these

external influences, the pathways through which they affect academic development are not always clearly articulated.

Many studies link neighbourhood disadvantage to reduced academic performance, but these findings often conflate correlation with causation. It remains unclear whether the outcomes are directly due to community-level deprivation or indirectly shaped by its influence on parental stress, school funding, or exposure to environmental hazards. In addition, few studies disaggregate the unique contributions of different community resources, such as mentorship programs, recreational facilities, or faith-based support systems.

Societal-level influences, including educational policies, funding inequities, and systemic discrimination, are frequently under examined in early childhood research. While structural issues such as housing instability, food insecurity, and digital exclusion are well-documented barriers to learning, they are rarely integrated into school-based intervention models. This gap limits the effectiveness of efforts to promote equity in education, as individual-focused strategies may overlook systemic constraints [33].

Synthesis Insight:

Community and societal factors shape the educational landscape in which children grow, yet much research fails to unpack their complex and layered effects. There is a need for integrated studies that explore how local and national systems intersect with personal and institutional factors to influence learning outcomes. Methodologically, this area would benefit from multi-level modelling, GIS-based community mapping, and policy evaluation studies to trace the effects of structural conditions on local academic environments.

Community context often determines what resources are available to families, what stressors educators must manage, and how inclusive or fragmented peer groups become. As such, community influences underpin and shape the environments in which all other factors unfold.

Table 1: Summary of Key Literature on Academic Outcomes in Early Schooling

Author(s)	Focus Area	Key Finding	Year
Checa et al.	Parenting Style & Behaviour	Parenting style affects both behaviour and academic results	2019
Sayal et al.	Behavioural Development	Early behavioural issues predict lower academic achievement	2015
Herbaut et al.	Early School Entry	Starting school at age 2 helps reduce developmental gaps	2024
Thompson et al.	School Influence	School quality shapes inequality in cognitive and social skills	2023
Park et al.	Reading Fluency	Early mastery of fluency correlates with academic success	2015
Perry & Weinstein	Social Context	Positive school social context aids school adjustment	1998

Taken together, these studies provide an important description of the myriad of forces bearing on academic outcomes during the primary years. From household dynamics and behavioural traits to institutional quality and peer interactions, literature points out that early education is not isolated but rather it is located within a child's larger ecology.

3. THEORETICAL FRAMEWORK: BRONFENBRENNER'S ECOLOGICAL SYSTEMS THEORY

Understanding the complex web of influences that shape academic outcomes in early childhood requires a theoretical framework capable of capturing multidimensional interactions. Bronfenbrenner's Ecological Systems Theory (1979) offers a robust conceptual lens through which to interpret the dynamic relationships between a child and their environments. This theory identifies five nested environmental systems—microsystem, mesosystem, exosystem, macrosystem, and chronosystem—each of which contributes to a child's development in unique and overlapping ways.

Microsystem: This innermost layer includes the direct, immediate contexts in which children live and learn, such as their home, school, and peer groups. Individual traits such as executive functioning, behavioural tendencies, and emotional self-regulation operate within this level, alongside proximal factors like teacher-student relationships and classroom environments. Studies emphasising attention regulation and teacher expectations fall within this sphere.

Mesosystem: This level represents the interconnections between different microsystems—for example, the relationship between home and school. Parental involvement in education and consistent communication with teachers reflect mesosystemic interactions that amplify or buffer the effects of each individual context. Research showing how family literacy practices complement school-based instruction exemplifies this dynamic.

Exosystem: This refers to external environments that indirectly affect the child, such as parents' workplaces, social service availability, or governmental funding policies. Socioeconomic status (SES), including access to resources and time availability of parents, is a central exosystemic factor, [34]. The impact of economic stress on parenting behaviour and children's academic outcomes illustrates this indirect pathway.

Macrosystem: This encompasses the overarching cultural, societal, and institutional structures that define normative values and expectations. Cultural attitudes toward education, national curriculum mandates, and systemic inequalities influence all lower systems. For instance, Finland's culturally rooted play-based early education approach (Finnish National Agency for Education, 2021) reflects macrosystemic values that prioritise developmental readiness over early formal instruction [35].

Chronosystem: This final system captures the dimension of time, including both the timing of life events and historical changes that influence development. Examples include the long-term impact of early school entry or transitions during critical developmental windows and the evolving influence of digital technologies on attention spans and learning behaviours over the past decade.

Bronfenbrenner's model is particularly well-suited to this study because it explicitly emphasises the bidirectional, layered, and context-dependent nature of child development. Academic outcomes are not merely products of isolated influences but rather emerge from the cumulative, dynamic interplay between individual traits and multilevel environmental contexts. This ecological framing supports the integrative analysis employed in the present review and offers a conceptual map for understanding the findings discussed in later sections.

4. METHODOLOGY

This study employs a narrative literature review to explore the diverse and interacting influences on academic outcomes in early schooling. Rather than conducting primary data collection, this approach enables the integration and critical synthesis of existing scholarly research across disciplines such as developmental psychology, early childhood education, and educational sociology. The purpose is to develop a coherent understanding of how various factors converge to shape children's educational trajectories during the primary years [36].

4.1 Research Design

The research follows an exploratory design, grounded in the narrative review format. This choice was made to allow flexibility in engaging with a wide spectrum of themes related to early academic achievement. Unlike systematic reviews that pursue comprehensive coverage of narrowly defined questions, this design facilitates the conceptual exploration of interrelated influences—ranging from micro-level child traits to broader socio-environmental conditions. This makes it especially suitable for examining the complex, multi-layered nature of educational outcomes in children aged five to eleven.

4.2 Literature Selection

The selection of literature was carried out through targeted searches in established academic databases, including Scopus, Web of Science, JSTOR, and ERIC. Only peer-reviewed publications were considered, with a primary focus on studies published within the last twenty-five years. However, older, seminal works were also included where foundational relevance was evident. Studies were selected based on their relevance to primary school-age children and their contribution to understanding academic achievement, cognitive and emotional development, and educational engagement. Preference was given to empirical research employing robust methodologies, such as longitudinal designs, mixed methods, and nationally representative datasets, to ensure analytical depth and credibility.

4.3 Thematic Framework

The thematic analysis within this review is informed by Bronfenbrenner's Ecological Systems Theory, which highlights the dynamic interactions between individual development and surrounding environmental systems. In accordance with this perspective, the literature was analysed in relation to five central domains: individual child characteristics, family environment, school and teacher-related factors, peer and social relationships, and community-level influences. This thematic structure provided a conceptual framework for examining how the different systems in a child's life converge and interact to influence educational outcome.

4.4 Analytical Approach

To extract meaningful insights from the literature, both deductive and inductive approaches to thematic coding were employed. The deductive component drew on established theoretical constructs to guide initial categorisation, while the inductive aspect allowed for the emergence of new patterns and relationships not pre-defined at the outset. This dual method enabled the identification of converging evidence across studies, as well as recognition of cultural and contextual divergences. The overall analytical goal was to generate a well-integrated interpretation of the data, highlighting critical mechanisms and conditions that shape academic achievement during the early years of formal education.

5. RESULTS AND DISCUSSION

The thematic analysis reveals that academic achievement in early schooling is influenced by an intricate interplay of developmental, familial, educational, social, and community-based factors. Rather than acting in isolation, these elements form a dynamic ecosystem that shapes a child's readiness, engagement, and capacity to succeed academically during the formative primary years.

5.1 Interactions between Individual Traits and Home Environment

Academic achievement in early schooling is not shaped by isolated influences, but by a layered, interacting system of personal traits, family dynamics, and institutional environments

[37]. Understanding how these variables interconnect is critical for identifying the root drivers of educational disparities and for designing holistic interventions.

Individual behavioural characteristics—such as attentional control and emotional regulation—are often regarded as personal traits, yet they are deeply embedded within the family and school microsystems. For instance, a child's ability to concentrate in class may be heavily mediated by the emotional climate at home and the consistency of routines such as sleep or reading. Likewise, temperamentally reactive children may struggle less in classrooms where teachers are trained in social-emotional learning and apply proactive behavioural support. Thus, personal traits do not act independently; they are shaped, supported, or exacerbated by their surrounding environments.

5.2 School Climate as a Moderator of Family and Individual Risk

Family dynamics also extend beyond direct academic support to shape the child's readiness for school engagement [38]. Socioeconomic status influences not only the availability of learning resources but also the emotional availability of caregivers, which in turn affects children's confidence and motivation. Parental stress—often linked to financial instability—can lead to harsher discipline or reduced cognitive stimulation at home, both of which negatively influence school readiness.

In this sense, SES does not act as a distant background factor, but as a powerful exosystemic driver that modulates the quality of proximal interactions in the microsystem. Teacher behaviours and school climates serve both as independent factors and as moderators of risk or resilience emerging from the home. For example, teacher sensitivity may buffer the negative effects of poor peer relationships or home instability. Children who face adversity in one system often show remarkable academic adaptation when supported in another—particularly when school environments are nurturing and predictable [38].

5.3 Peer Dynamics and Their Link to Emotional Security and Learning

Peer relationships play a dual role in early academic outcomes—as both a reflection of and an influence on a child's emotional and cognitive development. Children who experience peer acceptance tend to show greater engagement and motivation, while those facing exclusion or bullying are at risk for school avoidance and internalising behaviours. However, these outcomes are not solely the product of peer dynamics in isolation; they are shaped by broader emotional and behavioural skills that develop at home and are reinforced in school settings [39].

The relationship between peer interactions and academic performance is often mediated by classroom context. Supportive teacher practices—such as structured group work or emotion coaching—can mitigate the negative effects of peer conflict. At the same time, students who receive emotional support at home are often better equipped to navigate social challenges at school. These patterns illustrate a bidirectional model where emotional security acts as a bridge between social connection and academic persistence [40].

5.4 Community and Societal Forces: Shaping Opportunity and Access

Community and societal conditions form the outer layers of influence in a child's educational experience. Neighbourhood safety, access to enrichment programs, and availability of community resources influence not only school attendance but also parental stress, after-school learning, and exposure to language and social norms. These external environments may not directly interact with the child on a daily basis, but they structure the opportunities available within the home and school microsystems [41].

Moreover, systemic factors such as poverty, housing instability, and policy inequities shape how schools function and how families engage [42]. When schools in under-resourced

areas lack staff continuity or access to learning materials, even the most motivated students may struggle [43]. Similarly, policies that ignore the complexities of language, disability, or cultural context can unintentionally marginalise learners. These examples demonstrate how macro-level decisions cascade down to shape micro-level experiences, highlighting the importance of addressing structural barriers alongside individual and family interventions.

Table 2: Summary of Key Factors Influencing Academic Success in Primary School and School-Based Strategies

Factor	Relative Influence	Examples of School-Based Strategies
Cognitive and Executive Functioning	High	Differentiated instruction, early screening for learning difficulties, cognitive skill-building activities
Motivation and Self-Regulation	High	Incorporation of goal-setting tasks, self-monitoring tools, structured routines, classroom SEL programs
Parental Involvement	High	Family engagement workshops, regular parent-teacher communication, home learning support initiatives
Socioeconomic Status (SES)	High	Targeted interventions (e.g., Pupil Premium support), free school meals, after-school tutoring
Teacher Quality and Relationships	High	Ongoing professional development, emotionally responsive teaching, consistent classroom routines
School Infrastructure and Resources	Moderate	Investment in learning materials, technology access, classroom environment improvements
Peer Relationships	Moderate	Peer mentoring, anti-bullying campaigns, cooperative learning groups
Community Support and Environment	Moderate	School-community partnerships, outreach programs, child safety education
Health and Well-being	High	Health screenings, nutritional programs, mental health services
Birth Month	Low to Moderate (contextual)	Flexible school entry policies, differentiated expectations for younger cohort members

6. IMPLICATIONS FOR POLICY AND PRACTICE

The multifaceted nature of academic outcomes in early schooling requires interventions that are as layered and dynamic as the systems influencing them. Based on the critical synthesis of individual, familial, school-based, peer, and community-level factors, the following targeted recommendations are proposed for educators, policymakers, and families.

For Educators:

- **Implement relationship-centered classroom practices:** Prioritise teacher-student connection by integrating social-emotional learning (SEL) into daily routines. Offer professional development on emotion coaching, trauma-informed care, and culturally responsive pedagogy [44].
- **Use differentiated instruction frameworks:** Adjust teaching strategies to accommodate diverse learner profiles, particularly for students with attention, regulation, or language processing challenges.

- **Establish peer-support models:** Incorporate structured peer mentoring or buddy systems to support social inclusion, particularly for children at risk of isolation or exclusion.

For School Leaders and Policy Makers:

- **Invest in evidence-based teacher training:** Focus on professional development programs in phonics instruction, executive function development, and classroom behaviour management.
- **Address structural disparities through funding reform:** Allocate resources based on indices of community need, ensuring that under-resourced schools have access to staff continuity, learning materials, and safe infrastructure [45].
- **Support family-school partnerships:** Implement school-wide strategies that promote consistent, culturally sensitive communication with parents, particularly in multilingual or underserved communities.
- **Strengthen school-community partnerships:** Schools should engage local organisations, libraries, and after-school programs to create shared learning ecosystems. Hosting community events, establishing mentorship schemes, and encouraging joint planning with parents and neighbourhood leaders can promote educational equity and reinforce academic support outside the classroom. When schools serve as community hubs, they are better positioned to address the holistic needs of students and families—particularly in under-resourced areas [46].

For Parents and Caregivers:

- **Create predictable home learning environments:** Establish consistent routines (e.g., reading before bed, homework time) that support attention and self-regulation.
- **Engage in emotionally responsive parenting:** Foster secure attachment and emotional literacy through validation, conversation, and calm conflict resolution.
- **Advocate within community systems:** Join or support local parent groups, community education boards, or school committees to influence policies and resource allocation at the neighbourhood level.

Feasibility Considerations:

Implementing these recommendations in early education settings presents several systemic challenges. Funding for early years education is often fragmented across local authorities, NGOs, and school budgets, making it difficult to sustain large-scale interventions. Additionally, teacher burnout—exacerbated by high student-teacher ratios and administrative burdens—can hinder the uptake of new training initiatives. Parental engagement remains uneven, especially in underserved communities where time, language, or trust barriers complicate collaboration.

To address these realities, phased implementation is essential. For instance, the rollout of a school-wide social-emotional learning (SEL) program could begin with a pilot cohort of lower primary classrooms, accompanied by focused teacher training and parent orientation sessions. Once assessed and refined, the program could then expand to upper grades, supported by continuous feedback loops and stakeholder input [47]. This incremental model increases sustainability and helps build institutional confidence before full-scale adoption.

7. FUTURE RESEARCH DIRECTIONS

This review has underscored the deeply interconnected nature of influences on academic outcomes in early primary education, yet several gaps remain in the current body of literature. Addressing these will be essential to developing more effective, inclusive, and context-sensitive interventions.

Longitudinal, Mixed-Methods Research

Most existing studies rely on cross-sectional or short-term data, limiting understanding of how factors evolve over time. Future research should adopt longitudinal, mixed-methods designs to trace the co-development of cognitive, behavioural, and social competencies from early childhood through later schooling. Combining quantitative data with in-depth qualitative accounts from children, parents, and teachers would provide richer insight into developmental pathways.

Additionally, emerging variables such as children's relative age within their school cohort (i.e., month of birth) should be examined for their long-term impact on academic adjustment, especially in systems with rigid cut-off dates for school entry.

Interactional and Moderating Mechanisms

There is a need for studies that explicitly examine how different systems interact—for example, how school climate moderates the impact of family stress, or how peer acceptance mediates the relationship between emotional regulation and academic motivation. Using structural equation modelling or moderated mediation analyses could help disentangle these complex relationships.

Underrepresented and Diverse Populations

Much of the current research draws from Western, middle-class populations. Future studies should focus on culturally and linguistically diverse groups, children with disabilities, and those from structurally marginalised backgrounds [48]. This would ensure that findings are applicable across contexts and support the development of equity-driven educational practices.

Digital and Technological Influences

As digital exposure increases, there is a growing need to explore how screen time, educational technology, and online peer interactions affect attention, learning, and social development—particularly in early years. Longitudinal studies that evaluate the balance between tech use and developmental outcomes will be critical [49].

Policy-Linked Research and Implementation Studies

Few studies assess the real-world effectiveness of policy interventions designed to improve early academic outcomes. Future research should explore how teacher training programs, early childhood policies, or parental engagement initiatives translate into practice. Implementation science and participatory research models could be leveraged to bridge the research-practice gap.

Summary:

Future research must move beyond identifying single predictors to mapping the systemic, temporal, and cultural complexities that shape children's early learning. Methodological innovation, inclusive sampling, and applied relevance should drive the next wave of scholarship in this field [50].

CONCLUSION

Academic outcomes in early primary education are shaped by a web of interdependent influences that span individual traits, family dynamics, school environments, peer relationships, and broader community structures. This review has demonstrated that these factors do not operate in isolation; rather, they interact continuously across Bronfenbrenner's ecological systems, amplifying or buffering one another's effects. For example, a child's attentional control is influenced not only by inherent behavioural dispositions but also by parenting consistency, classroom climate, and peer acceptance.

Critically evaluating the literature reveals both the strengths and limitations of current research. While there is strong evidence linking early behavioural regulation, parental involvement, and teacher relationships to academic success, much of the research remains

fragmented and lacks attention to context, cultural variation, and systemic interactions. Furthermore, under representation of diverse populations and the absence of causal or longitudinal analyses leave important questions unanswered.

In response, this paper advocates for more holistic, equity-driven approaches to educational policy and practice. Interventions must be grounded in the complexity of children's lived environments—addressing both proximal supports and structural conditions. Specific strategies for teachers, families, and policymakers were outlined to foster more inclusive and resilient learning ecosystems.

Ultimately, improving academic outcomes in early schooling requires a paradigm shift: from treating learning as the product of individual ability, to recognising it as the outcome of layered, relational, and evolving systems. Future research must embrace this complexity to inform sustainable educational reform and child development practice.

REFERENCES

[1] Allen, K., Hansford, L., Hayes, R., Longdon, B., Allwood, M., Price, A., … Ford, T. (2022). Teachers' views on the acceptability and implementation of the Incredible Years® Teacher Classroom Management programme in English (UK) primary schools from the STARS trial. *British Journal of Educational Psychology, 92*(3), 1160–1177. https://doi.org/10.1111/bjep.12493

[2] Ashely-Welbeck, A., & Vlachopoulos, D. (2020). Teachers' perceptions on using Augmented Reality for language learning in Primary Years Programme (PYP) education. *International Journal of Emerging Technologies in Learning, 15*(12), 116–135. https://doi.org/10.3991/ijet.v15i12.13499

[3] Alturki, S., Hulpuș, I., & Stuckenschmidt, H. (2022). Predicting academic outcomes: A survey from 2007 till 2018. *Technology, Knowledge and Learning, 27*(1), 275-307. https://doi.org/10.1007/s10758-020-09476-0

[4] Akinyemiju, T., Abera, S., Ahmed, M., Alam, N., Alemayohu, M. A., Allen, C., ... & Global Burden of Disease Liver Cancer Collaboration. (2017). The burden of primary liver cancer and underlying etiologies from 1990 to 2015 at the global, regional, and national level: results from the global burden of disease study 2015. *JAMA oncology, 3*(12), 1683-1691.

[5] Blair, C., & Raver, C. C. (2015). School readiness and self-regulation: A developmental psychobiological approach. *Annual review of psychology, 66*(1), 711-731. https://doi.org/10.1146/annurev-psych-010814-015221

[6] Blystad, A., Moland, K. M., Munsaka, E., Sandøy, I., & Zulu, J. (2020). Vanilla bisquits and lobola bridewealth: Parallel discourses on early pregnancy and schooling in rural Zambia. *BMC Public Health, 20*(1). https://doi.org/10.1186/s12889-020-09555-y

[7] Brennan, E. B., & Acosta-Martinez, V. (2017). Cover cropping frequency is the main driver of soil microbial changes during six years of organic vegetable production. *Soil Biology and Biochemistry, 109*, 188-204. https://doi.org/10.1016/j.soilbio.2017.01.014

[8] Buchanan, D., Hargreaves, E., & Quick, L. (2023). Schools closed during the pandemic: revelations about the well-being of 'lower-attaining'primary-school children. *Education 3-13, 51*(7), 1077-1090. https://doi.org/10.1080/03004279.2022.2043405

[9] Checa, P., Abundis-Gutierrez, A., Pérez-Dueñas, C., & Fernández-Parra, A. (2019). Influence of maternal and paternal parenting style and behavior problems on academic outcomes in primary school. *Frontiers in Psychology, 10*(MAR). https://doi.org/10.3389/fpsyg.2019.00378

[10] Camilli, G., Vargas, S., Ryan, S., & Barnett, W. S. (2010). Meta-analysis of the effects of early education interventions on cognitive and social development. *Teachers college record, 112*(3), 579-620. https://doi.org/10.1177/016146811011200303

[11] Ciężki, S., Kurpiewska, E., Bossowski, A., & Głowińska-Olszewska, B. (2022, June 16). Multi-Faceted Influence of Obesity on Type 1 Diabetes in Children – From Disease Pathogenesis to Complications. *Frontiers in Endocrinology. Frontiers Media S.A.* https://doi.org/10.3389/fendo.2022.890833

[12] Casale, D. (2020). Recovery from stunting in early childhood and subsequent schooling outcomes: Evidence from NIDS Waves 1–5. *Development Southern Africa, 37*(3), 483–500. https://doi.org/10.1080/0376835X.2020.1715790

[13] Checa, P., Abundis-Gutierrez, A., Pérez-Dueñas, C., & Fernández-Parra, A. (2019). Influence of maternal and paternal parenting style and behavior problems on academic outcomes in primary school. *Frontiers in Psychology, 10*(MAR). https://doi.org/10.3389/fpsyg.2019.00378

[14] Crisp, G., Taggart, A., & Nora, A. (2015). Undergraduate Latina/o students: A systematic review of research identifying factors contributing to academic success outcomes. *Review of Educational Research, 85*(2), 249-274. https://doi.org/10.3102/0034654314551064

[15] Cvencek, D., Meltzoff, A. N., & Greenwald, A. G. (2011). Math–gender stereotypes in elementary school children. *Child development, 82*(3), 766-779. https://doi.org/10.1111/j.1467-8624.2010.01529.x

[16] Challender, D. W., Harrop, S. R., & MacMillan, D. C. (2015). Towards informed and multi-faceted wildlife trade interventions. *Global Ecology and Conservation, 3*, 129-148. https://doi.org/10.1016/j.gecco.2014.11.010

[17] Chaaban, Y., Naccache, H., & Elmadad, J. (2024). A Multi-Faceted Analysis of the Factors Influencing Adolescents' Career Aspirations: Recommendations for Policy. *Leadership and Policy in Schools,* 1-17. https://doi.org/10.1080/15700763.2024.2428313

[18] Dewald, J. F., Meijer, A. M., Oort, F. J., Kerkhof, G. A., & Bögels, S. M. (2010). The influence of sleep quality, sleep duration and sleepiness on school performance in children and adolescents: A meta-analytic review. *Sleep medicine reviews, 14*(3), 179-189. https://doi.org/10.1016/j.smrv.2009.10.004

[19] De Neve, J. W., & Subramanian, S. V. (2018). Causal Effect of Parental Schooling on Early Childhood Undernutrition: Quasi-Experimental Evidence from Zimbabwe. *American Journal of Epidemiology, 187*(1), 82–93. https://doi.org/10.1093/aje/kwx195

[20] El Nokali, N. E., Bachman, H. J., & Votruba-Drzal, E. (2010). Parent involvement and children's academic and social development in elementary school. *Child development, 81*(3), 988-1005. https://doi.org/10.1111/j.1467-8624.2010.01447.x

[21] Einarsdottir, J. (2010). Children's experiences of the first year of primary school. *European Early Childhood Education Research Journal, 18*(2), 163-180. https://doi.org/10.1080/13502931003784370

[22] Fishstrom, S., Wang, H. H., Bhat, B. H., Daniel, J., Dille, J., Capin, P., & Vaughn, S. (2022). A meta-analysis of the effects of academic interventions on academic achievement and academic anxiety outcomes in elementary school children. *Journal of School Psychology, 92*, 265–284. https://doi.org/10.1016/j.jsp.2022.03.011

[23] Ghoroi, C., Gurumurthy, L., McDaniel, D. J., Jallo, L. J., & Davé, R. N. (2013). Multi-faceted characterization of pharmaceutical powders to discern the influence of surface modification. *Powder Technology, 236*, 63-74. https://doi.org/10.1016/j.powtec.2012.05.039

[24] Ghosh, S., Jackson-Cook, C., Singhal, N., & Hui, S. P. (2023). Editorial: Down syndrome: Genetic and epigenetic influences on this multi-faceted condition. Frontiers in Genetics. *Frontiers Media S.A.* https://doi.org/10.3389/fgene.2023.1163133

[25] Herbaut, E., Farges, G., & Giret, J. F. (2024). Can early schooling at age 2 narrow the gaps in child development? Evidence from the French Elfe cohort. *Oxford Review of Education*. https://doi.org/10.1080/03054985.2024.2305474
[26] Hartney, M. T., & Flavin, P. (2014). The political foundations of the Black–White education achievement gap. *American Politics Research, 42*(1), 3-33. https://doi.org/10.1177/1532673X13482967
[27] Hamilton, C., & Murphy, V. A. (2024). Folk pedagogy? Investigating how and why UK early years and primary teachers use songs with young learners. *Education 3-13, 52*(8), 1488–1509. https://doi.org/10.1080/03004279.2023.2168132
[28] Hanushek, E. A., & Woessmann, L. (2011). The economics of international differences in educational achievement. *Handbook of the Economics of Education, 3*, 89-200. https://doi.org/10.1016/B978-0-444-53429-3.00002-8
[29] Houry, D., Swahn, M. H., & Hankin, A. (2013). Using a multidisciplinary approach for a multi-faceted public health problem. *Western journal of emergency medicine, 14*(4), 301. https://doi.org/10.5811/westjem.2013.3.16333
[30] Hedges, H., & Cullen, J. (2012). Participatory learning theories: A framework for early childhood pedagogy. *Early Child Development and Care, 182*(7), 921-940. https://doi.org/10.1080/03004430.2011.597504
[31] Jo, H., & Park, D. H. (2024). A Multi-Faceted Examination of Social Robots Adoption: Influences of Perceived Enjoyment, Social Attraction, and Pet Experience. *IEEE Access*. https://doi.org/10.1109/ACCESS.2024.3434544
[32] Kobicheva, A. (2022). Comparative Study on Students' Engagement and Academic Outcomes in Live Online Learning at University. *Education Sciences, 12*(6). https://doi.org/10.3390/educsci12060371
[33] Kao, G., & Tienda, M. (2022). Optimism and achievement: The educational performance of immigrant youth. In *The new immigrants and American schools* (pp. 83-101). Routledge.
[34] Kobicheva, A. (2022). Comparative Study on Students' Engagement and Academic Outcomes in Live Online Learning at University. *Education Sciences, 12*(6). https://doi.org/10.3390/educsci12060371
[35] König, J., Jäger-Biela, D. J., & Glutsch, N. (2020). Adapting to online teaching during COVID-19 school closure: teacher education and teacher competence effects among early career teachers in Germany. *European journal of teacher education, 43*(4), 608-622. https://doi.org/10.1080/02619768.2020.1809650
[36] Ladwig, J. G. (2010). Beyond academic outcomes. *Review of research in education, 34*(1), 113-141. https://doi.org/10.3102/0091732X09353062
[37] Liu, H., Zhu, Y., Wang, C., Ding, J., Yu, J., & Tang, F. (2023). Incorporating Heterogeneous User Behaviors and Social Influences for Predictive Analysis. *IEEE Transactions on Big Data, 9*(2), 716–732. https://doi.org/10.1109/TBDATA.2022.3193028
[38] Li, Y., Fan, J., Ovchinnikov, G., & Karras, P. (2019, April). Maximizing multifaceted network influence. In *2019 IEEE 35th International Conference on Data Engineering (ICDE)* (pp. 446-457). IEEE. https://doi.org/10.1109/ICDE.2019.00047
[39] Li, R., Che Hassan, N., & Saharuddin, N. (2023). *Psychological Capital Related to Academic Outcomes Among University Students: A Systematic Literature Review*. Psychology Research and Behavior Management. Dove Medical Press Ltd. https://doi.org/10.2147/PRBM.S421549
[40] Legewie, J., & DiPrete, T. A. (2012). School context and the gender gap in educational achievement. *American sociological review, 77*(3), 463-485. https://doi.org/10.1177/0003122412440802

[41] Li, I. W., Jackson, D., & Carroll, D. R. (2023). Influence of equity group status and entry pathway on academic outcomes in higher education. *Journal of Higher Education Policy and Management, 45*(2), 140-159. https://doi.org/10.1080/1360080X.2023.2180163

[42] Luo, X., Li, H., Zhang, J., & Shim, J. P. (2010). Examining multi-dimensional trust and multi-faceted risk in initial acceptance of emerging technologies: An empirical study of mobile banking services. *Decision support systems, 49*(2), 222-234. https://doi.org/10.1016/j.dss.2010.02.008

[43] Lauermann, F., & ten Hagen, I. (2021). Do teachers' perceived teaching competence and self-efficacy affect students' academic outcomes? A closer look at student-reported classroom processes and outcomes. *Educational psychologist, 56*(4), 265-282. https://doi.org/10.1080/00461520.2021.1991355

[44] Murphy, J. M., Guzmán, J., McCarthy, A. E., Squicciarini, A. M., George, M., Canenguez, K. M., ... & Jellinek, M. S. (2015). Mental health predicts better academic outcomes: A longitudinal study of elementary school students in Chile. *Child Psychiatry & Human Development, 46,* 245-256. https://doi.org/10.1007/s10578-014-0464-4

[45] Malvaso, C. G., Delfabbro, P. H., & Day, A. (2016). Risk factors that influence the maltreatment-offending association: A systematic review of prospective and longitudinal studies. *Aggression and violent behavior, 31*, 1-15. https://doi.org/10.1016/j.avb.2016.06.006

[46] Murphy, J. M., Guzmán, J., McCarthy, A. E., Squicciarini, A. M., George, M., Canenguez, K. M., ... & Jellinek, M. S. (2015). Mental health predicts better academic outcomes: A longitudinal study of elementary school students in Chile. *Child Psychiatry & Human Development, 46*, 245-256. https://doi.org/10.1027/2151-2604/a000287

[47] Nikolopoulou, K. (2022). Online Education in Early Primary Years: Teachers' Practices and Experiences during the COVID-19 Pandemic. *Education Sciences, 12*(2). https://doi.org/10.3390/educsci12020076

[48] Osborne, J. W., & Jones, B. D. (2011). Identification with academics and motivation to achieve in school: How the structure of the self influences academic outcomes. *Educational Psychology Review, 23,* 131-158. https://doi.org/10.1007/s10648-011-9151-1

[49] Ostrom, Q. T., Cioffi, G., Gittleman, H., Patil, N., Waite, K., Kruchko, C., & Barnholtz-Sloan, J. S. (2019). CBTRUS statistical report: primary brain and other central nervous system tumors diagnosed in the United States in 2012–2016. *Neuro-oncology, 21*(Supplement_5), v1-v100. https://doi.org/10.1093/neuonc/noz150

[50] Park, Y., Chaparro, E. A., Preciado, J., & Cummings, K. D. (2015). Is Earlier Better? Mastery of Reading Fluency in Early Schooling. *Early Education and Development, 26*(8), 1187–1209. https://doi.org/10.1080/10409289.2015.1015855