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A NARRATIVE REVIEW OF ECONOMIC, SOCIAL, AND CULTURAL STATUS (ESCS) AND ITS IMPACT ON STUDENT ACHIEVEMENT IN CROSS-NATIONAL CONTEXTS

Theresa Arhimah[a], Matilda Thompson[b*]
[a] *Department of Mathematical Sciences, Ball State University, Indiana, USA*
[b] *Department of English, University of Ghana, Ghana*
**Corresponding Author: Matilda Thompson*

ABSTRACT
This study presents a systematic literature review (SLR) on the influence of Economic, Social, and Cultural Status (ESCS) on student academic achievement across multiple cycles of the Programme for International Student Assessment (PISA). By synthesizing empirical findings from diverse national contexts, the research identifies consistent patterns in how ESCS dimensions—such as parental education, household resources, and cultural capital—affect performance in reading, mathematics, and science. Using a structured search across databases including Scopus, Web of Science, ERIC, ScienceDirect, and Google Scholar, the study selected peer-reviewed articles that utilized PISA data and employed rigorous quantitative methods. A narrative synthesis approach was adopted due to heterogeneity in study designs and methodologies. Findings reveal that students from higher ESCS backgrounds consistently outperform their lower-ESCS peers across academic domains, with the achievement gap most pronounced in countries with rigid tracking or stratified school systems. In contrast, nations with equitable education policies and inclusive reforms tend to show narrower performance disparities. The study contributes to a deeper understanding of global educational inequalities and offers insights to inform policies aimed at reducing achievement gaps and promoting equity in education.

KEYWORDS: *Economic, Social, and Cultural Status (ESCS), PISA, Student Achievement, Educational Inequality, Systematic Literature Review*

1. INTRODUCTION

Education is a critical pathway to social mobility and economic development, yet disparities in student achievement persist globally. A growing body of research highlights that a student's Economic, Social, and Cultural Status (ESCS) significantly influences educational outcomes. The ESCS index, as defined by the Organisation for Economic Co-operation and Development (OECD), incorporates parental occupation, parental education, and household resources, each which can affect access to learning opportunities and academic support (OECD, 2019).

Students from higher ESCS backgrounds tend to have better academic outcomes across reading, mathematics, and science (Sirin, 2005; OECD, 2018). Economic resources enable access to private tutoring, high-quality schools, and educational materials, which are often out of reach for students from low-income families (Chmielewski, 2019). Moreover, parents' education levels and involvement significantly influence children's academic aspirations, forming the social and cultural context within which learning occurs.

Recent studies have deepened our understanding of how socioeconomic factors influence student achievement across different countries. For instance, Nonoyama-Tarumi and Reardon (2024) analyzed data from international large-scale assessments and found that the size of achievement gaps associated with socioeconomic status (SES) varies significantly across nations. Their research suggests that both lower-tail and upper-tail SES achievement gaps are influenced by economic and educational inequalities within countries.

International studies using data from the Programme for International Student Assessment (PISA) have provided valuable insights into how ESCS affects student performance across different countries and time periods. Chmielewski and Reardon (2016) showed that the strength of the income-achievement relationship varies notably across nations, often shaped by income inequality and education policy. Similarly, Jerrim and Macmillan (2015) emphasized the importance of cross-national research to understand the extent and mechanisms of educational inequalities.

Despite substantial empirical evidence, several gaps remain in the literature. First, many studies focus on high-income, Western countries, limiting global generalizability (Chmielewski & Reardon, 2016). Second, inconsistent definitions and operationalizations of ESCS make it difficult to compare findings across studies. Third, relatively few studies adopt multilevel modeling to account for the nested nature

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of educational data—students within schools, and schools within countries. Finally, the role of policy reforms, digital equity, and longitudinal change remains underexplored, especially in the post-pandemic context.

This narrative review aims to examine the relationship between ESCS and student achievement across countries, educational systems, and PISA cycles. Specifically, it explores how economic (e.g., parental employment), social (e.g., parental education), and cultural (e.g., home possessions) factors predict performance in mathematics, reading, and science. It also analyzes whether educational contexts—such as school quality or national policy—moderate the ESCS-achievement gap. The review offers insights to support evidence-based policymaking and enhance educational equity on a global scale.

2. LITERATURE REVIEW

2.1 Theoretical Frameworks on Socioeconomic Status and Educational Achievement

The impact of socioeconomic background on educational outcomes has been extensively examined through various sociological and educational theories. Bourdieu's Theory of Cultural Capital posits that individuals from higher socioeconomic backgrounds possess cultural assets—such as language proficiency and familiarity with dominant cultural codes—that align with the expectations of educational institutions, thereby facilitating academic success (Bourdieu, 1986).

Coleman's Social Capital Theory emphasizes the role of social networks and relationships in providing support and resources that contribute to educational achievement (Coleman, 1988). Building upon these foundational theories, Bronfenbrenner's Ecological Systems Theory highlights the multiple environmental systems influencing a child's development, including family, school, and broader societal contexts (Bronfenbrenner, 1979).

Recent research underscores the multidimensional nature of socioeconomic status (SES), advocating for a more nuanced understanding that considers various indicators such as parental education, occupational status, and access to resources (Eriksson et al., 2021). This approach recognizes that the specific components of SES contributing to student achievement may vary across different societal contexts.

2.2 Empirical Evidence on ESCS and Student Achievement

Empirical studies consistently demonstrate the significant influence of ESCS on educational performance. For instance, Sirin (2005) conducted a meta-analysis revealing a strong correlation between SES and academic achievement. Data from the Programme for International Student Assessment (PISA) further indicates that socioeconomic disparities account for a substantial proportion of the variance in student performance across OECD countries (OECD, 2019).

Chmielewski (2019) found that the socioeconomic achievement gap has widened in many countries over recent decades, particularly in nations experiencing rising income inequality. This widening gap underscores the need for targeted policy interventions to address educational disparities. Research by Hanushek and Woessmann (2011) explored the role of school quality in mitigating socioeconomic disadvantages. Their findings indicate that enhancing educational quality-particularly through improved teacher effectiveness and cognitive skill development, reduces the negative impact of low ESCS (Economic, Social, and Cultural Status) on student outcomes. While institutional structures and family background remain influential, their work underscores that prioritizing measurable school quality factors, rather than quantitative inputs like funding or class size, is critical for supporting disadvantaged students.

Table 1: Summary of Key Empirical Findings on ESCS and Student Achievement

Study	Data Source / Method	Key Findings	Implications
Sirin (2005)	Meta-analysis of 74 studies	Found a strong, consistent correlation between socioeconomic status (SES) and academic achievement across various settings.	Reinforces the centrality of SES in predicting student performance.
OECD (2019)	PISA data across OECD countries	Socioeconomic disparities account for a significant share of variation in student outcomes.	Cross-national policy focus needed to close ESCS-related achievement gaps.
Chmielewski (2019)	Cross-national longitudinal analysis	Socioeconomic achievement gaps have widened in many countries alongside rising income inequality.	Highlights the urgency of addressing inequality as a systemic barrier to education equity.
Hanushek & Woessmann (2011)	Cross-country analysis with focus on school quality	School quality (e.g., effective teaching, cognitive skill development) mitigates the negative impact of low ESCS more effectively than inputs like class size.	Emphasizes need for quality-focused reforms to support disadvantaged learners.

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2.3 Cross-Country Variations in ESCS Impact

The relationship between ESCS and student achievement varies significantly across countries, influenced by educational policies and institutional structures. PISA data show that in countries like China, Spain, and Portugal, students from less privileged backgrounds achieve relatively strong academic outcomes compared to global averages, suggesting systemic factors such as targeted resource allocation or curriculum design may mitigate socioeconomic disadvantages (Neuman, 2022; Avvisati, & Wuyts, 2024).

In contrast, Latin American countries exhibit pronounced disparities in educational performance linked to socioeconomic status, with 75% of 15-year-olds struggling in mathematics and widespread inequality in access to quality education. These gaps underscore the importance of equitable school environments and policy interventions to address socioeconomic barriers (Friedrich Naumann Foundation, 2024; Schleicher 2022; Avvisati, & Wuyts, 2024).

Educational tracking systems, which sort students into academic pathways, exacerbate inequality. Hanushek and Woessmann (2006) demonstrated that early tracking amplifies performance disparities across socioeconomic groups without improving average outcomes. While some argue tracking enhances achievement through classroom homogeneity (Heisig & Matthewes, 2022), rigorous multiverse analyses of PISA, TIMSS, and PIRLS data (1995–2019) reveal limited empirical support for this claim, particularly when controlling for pre-existing student achievement and socioeconomic segregation (Brinkmann et al., 2024).

2.4 Influence of ESCS on Different Educational Cycles

The influence of ESCS on student achievement begins early and persists throughout a student's educational journey. Research indicates that children from lower ESCS backgrounds often start school with fewer cognitive and non-cognitive skills, and these initial disadvantages tend to accumulate, leading to widening achievement gaps over time (OECD, 2022). International assessments such as PISA confirm that socio-economic disparities in skills are already evident by age five and continue to grow through primary and secondary education. By age 15, students from disadvantaged backgrounds perform significantly lower in mathematics, reading, and science compared to their more advantaged peers (OECD, 2022). These students are also more likely to attend schools with fewer resources and less experienced teachers, further compounding educational inequities (Chzhen & Leesch, 2023).

Heckman (2006) emphasizes the importance of early childhood experiences in shaping cognitive and non-cognitive skills, noting that children from low-ESCS backgrounds often enter school with weaker foundational skills. Longitudinal studies support the view that early disadvantages accumulate over time, reinforcing and expanding achievement gaps throughout a student's academic career.

2.5 ESCS Indicators in Educational Research

The PISA framework measures ESCS as a composite index based on three main components:

- Parental education level
- Parental occupational status (using the Highest International Socio-Economic Index of Occupational Status, HISEI)
- Home possessions, including educational resources such as books, computers, and other cultural assets (Avvisati, & Wuyts, 2024; OECD. 2022).

Empirical studies consistently find that ESCS is a strong predictor of student achievement. For example, analyses of PISA data show that, on average across OECD countries, ESCS accounts for about 15% of the variation in mathematics performance, and a one-unit increase in the ESCS index is associated with a 39-point increase in mathematics scores. This relationship is robust across reading and science as well, and students from higher ESCS backgrounds consistently outperform their peers (Esen & Adıgüzel, 2023; OECD. (2022).

2.6 Methodological Approaches in ESCS Research

Researchers employ a range of statistical models to analyze the relationship between ESCS and student achievement. While traditional regression models are common, the nested structure of educational data- students within schools, schools within countries- makes hierarchical linear models (HLM) and mixed-effects models especially suitable, as they account for both within-school and between-school variations (Raudenbush, 2002). These models have been shown to effectively capture the multi-level influences of ESCS on educational outcomes (Perry & McConney, 2010). In recent years, advanced machine learning methods, such as random forests and XGBoost, have also been used to identify non-linear relationships and complex interactions in large-scale educational datasets (Cutler et al., 2007).

2.7 Gaps in Existing Literature

Despite extensive research, several gaps remain. First, there is limited longitudinal analysis of how ESCS-related disparities evolve across educational cycles and over time, particularly in the context of successive PISA assessments. Second, while many studies focus

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on single-country analyses, there is a need for more comparative cross-national research to identify effective policy responses and international best practices. Finally, research on the interactive and combined effects of the economic, social, and cultural components of ESCS is still underdeveloped, as most studies consider these indicators in aggregate rather than examining their individual or synergistic contributions.

3. REVIEW METHOD

This study employed a **systematic literature review (SLR)** to explore the impact of Economic, Social, and Cultural Status (ESCS) on student achievement across different PISA cycles. The SLR approach ensured methodological transparency and allowed for a comprehensive synthesis of existing quantitative research.

A detailed search was conducted across major academic databases—**Scopus, Web of Science, ERIC, ScienceDirect, and Google Scholar**—using relevant terms such as "PISA," "ESCS," "socioeconomic status," "student achievement," and the PISA cycles "2015," "2018," and "2022." The inclusion criteria focused on **peer-reviewed, English-language studies** that used PISA data and quantitatively analyzed the relationship between ESCS and academic outcomes in reading, mathematics, or science.

Studies were selected based on **relevance, methodological rigor, and clarity in how ESCS was measured**. Due to differences in research design and country contexts, a **narrative synthesis** was used rather than a meta-analysis. Key patterns in the influence of ESCS were identified, with attention to **cross-country comparisons**, the distinct roles of economic, social, and cultural capital, and **policy or structural factors** that shaped outcomes.

Although the exclusion of qualitative and non-English studies may limit the scope of insights, the method's rigor and broad database coverage strengthen the validity and applicability of the review's findings.

4. LITERATURE SYNTHESIS AND THEMATIC DISCUSSION

This section synthesizes key findings from the literature into five thematic areas that collectively explain how economic, social, and cultural status (ESCS) shapes educational outcomes. Each theme contributes to a deeper understanding of the dynamics between students' backgrounds and their academic performance across different countries and over time, particularly through data obtained from the Programme for International Student Assessment (PISA).

a. Economic Status and Educational Outcomes

One of the most consistent predictors of academic achievement is economic status, typically measured through indicators such as parental occupation and home possessions. Numerous studies confirm that students from higher socioeconomic backgrounds tend to perform better academically due to access to a broader range of educational resources, stable housing, nutritious food, and enriching extracurricular activities (Perry & McConney, 2010). These factors create a conducive learning environment that supports cognitive and emotional development.

It's important to note that in PISA, economic status is not measured directly through family income, but rather through the highest parental occupation (HISEI) and home possessions (HOMEPOS) components of the ESCS index. The HOMEPOS component serves as a proxy for family wealth since direct income measures are not available in PISA data
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Disparities in educational investment further exacerbate these inequalities. Chmielewski (2019) provides compelling evidence that income inequality at the national level magnifies the relationship between economic status and student performance. In countries with high income inequality, children from low-income families face greater educational disadvantages, partly because public education systems often fail to compensate for these gaps. In contrast, more egalitarian societies-typically in Northern and Western Europe-demonstrate narrower performance gaps between socioeconomic groups.

Additionally, family resources influence a family's ability to invest in private tutoring, educational technologies, and access to selective schools-resources that significantly affect student outcomes. The cumulative effect of these investments reinforces achievement disparities, particularly in market-driven educational systems.

b. Social and Cultural Capital

Beyond financial resources, social and cultural capital significantly contribute to educational attainment. Drawing from Bourdieu's theory, cultural capital encompasses non-economic assets such as knowledge, behaviors, language proficiency, and educational

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credentials that promote social mobility and educational success. Parental education, as a key indicator of cultural capital, shapes children's exposure to language, learning habits, and structured environments, which in turn foster literacy and numeracy skills (Sullivan, 2002; Lundborg et al.,2014).

The home literacy environment-measured by the availability of books, frequency of reading activities, and parental engagement in schooling-has been shown to mediate the relationship between socioeconomic status and academic achievement, especially in reading (Sullivan, A. (2001). Social capital, defined as the resources and support accessible through family and social networks, also plays a crucial role in educational outcomes. Children from higher social classes often benefit from well-resourced schools, supportive peer networks, and guidance that enhance their academic prospects (Easy Sociology, 2024).

Importantly, the value and definition of cultural capital can vary across national and cultural contexts. For example, while Western educational systems may emphasize cultural participation and language exposure, East Asian systems often prioritize discipline, effort, and exam performance, reflecting different forms of cultural advantage.

c. Cross-National Differences in ESCS Effects

The effect of ESCS on academic performance varies significantly across countries. Large-scale assessments like PISA have enabled comparative analyses that reveal substantial cross-national differences in the strength and nature of this relationship. Recent research shows that, contrary to common assumptions, SES-related achievement gaps in the Nordic countries (Denmark, Finland, Iceland, Norway, and Sweden) are not particularly small; over the past two decades, these gaps have widened and now resemble those in other European countries, despite strong social welfare systems and public investments in education (Nonoyama-Tarumi & Reardon, 2024; Chmielewski & Reardon (2016); Carneiro et al., 2024).

In Anglo-American countries such as the United States and the United Kingdom, student achievement is highly sensitive to socioeconomic background, with larger SES gradients compared to many other developed nations. East Asian countries (e.g., South Korea, Japan, Singapore) tend to achieve high average academic performance, but often have hidden inequalities linked to private tutoring and intense academic competition. Latin American countries, characterized by high income inequality and underfunded education systems, generally display some of the largest ESCS-achievement gaps.

These differences are shaped by national education policies, including levels of public investment in early childhood education, the prevalence of ability grouping or tracking, and the degree of school autonomy in curricular and personnel decisions (Hanushek & Woessmann, 2006; Heisig & Matthewes, 2022).

d. Temporal Trends Across PISA Cycles

Research examining how the relationship between Economic, Social, and Cultural Status (ESCS) and academic performance has evolved over time reveals mixed but concerning patterns. OECD PISA data from 2000 to 2022 indicate that in many countries, the socioeconomic achievement gap has remained relatively stable over the last decade, though some countries have successfully narrowed the gap while others have seen it widen slightly.

Longitudinal analyses by Chmielewski (2019) show that socioeconomic achievement gaps increased globally between 1964 and 2015, a trend that recent PISA results largely reinforce. Schleicher (2019) notes that countries undergoing rapid educational expansion often experience temporary increases in inequality, as initial benefits tend to accrue disproportionately to more advantaged groups.

Notably, the influence of ESCS on achievement is more pronounced in mathematics and science than in reading, with disparities often widening as students' progress through their education. This widening gap is attributed to unequal access to advanced coursework, quality instruction, and extracurricular academic support. These findings emphasize the importance of early and sustained policy interventions to promote equity in educational outcomes.

e. School-Level Moderators

Schools play a pivotal role in either amplifying or mitigating the effects of socioeconomic disadvantage on student achievement. Key factors such as school infrastructure quality, teacher qualifications, and overall school climate significantly influence how Economic, Social, and Cultural Status (ESCS) translates into academic outcomes. High-quality schools can serve as equalizers by providing enriched learning environments that compensate for students' disadvantaged backgrounds. Research indicates that students from low-SES backgrounds benefit more from attending schools with strong professional communities and effective teaching practices (Raudenbush, 2002).

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Tracking Policies: The practice of grouping students by ability, known as tracking, has been scrutinized for its impact on educational equity. While some argue that tracking allows for tailored instruction, evidence suggests it often reinforces existing inequalities. Early tracking can limit low-SES students' access to high-quality instruction and advanced coursework, thereby exacerbating achievement gaps (Hanushek & Wößmann, 2006; 2020; Strello et al., 2021).

Teacher Quality: The distribution of qualified and experienced teachers is often uneven, with under-resourced schools more likely to have less experienced educators. This disparity contributes to the persistence of achievement gaps, as teacher effectiveness is a critical determinant of student success. Studies have shown that students in disadvantaged schools are more likely to be taught by unqualified or novice teachers, which can negatively impact their academic outcomes (Clotfelter et al., 2006; Nyatsikor et al., 2020).

School Autonomy and Governance: The impact of school autonomy on educational outcomes varies depending on the type of autonomy and accountability structures. While autonomy in curriculum design and budget management can foster innovation, evidence from cross-national studies shows that without robust accountability mechanisms, increased autonomy often exacerbates achievement gaps by disproportionately benefiting high-SES students while disadvantaging low-SES and immigrant students (Irmert et al., 2024).

Analytical Approaches: Understanding the complex interplay between individual and school-level factors requires sophisticated analytical methods. Hierarchical Linear Modeling (HLM) is particularly useful in this context, as it accounts for the nested structure of educational data—students within schools—and allows researchers to disentangle the effects of various predictors on student achievement (Raudenbush, 2002).

5. CONCLUSION

This systematic literature review examined how Economic, Social, and Cultural Status (ESCS) influences student achievement across multiple PISA cycles. The findings consistently show that students from higher ESCS backgrounds perform better in reading, mathematics, and science, with parental education and cultural capital emerging as key drivers. Cross-country comparisons revealed that education systems with stronger equity measures tend to exhibit smaller achievement gaps, while those with rigid tracking or stratification show wider disparities. Although much of the research focuses on high-income countries using quantitative methods, there is a need for more diverse, context-sensitive studies—particularly in low- and middle-income settings. Ultimately, addressing ESCS-related disparities is crucial to improving educational equity. Targeted interventions such as equitable school funding, early learning support, and family engagement can help mitigate the effects of disadvantage. Continued international assessments like PISA remain essential for guiding evidence-based education policies.

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