

# ***A Systematic Literature Review of the Influence of Remote Learning on Low SES Communities in Developing Countries***

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**Abstract:** This systematic literature review examines the impact of online education on low-income families in developing countries. Given the advancement and globalization of educational technology, there is a need and value for more research in this area. Researchers conducted a systematic screening of 252 studies and a subsequent in-depth analysis of the 24 most relevant studies. Findings reveal that while there is a wealth of research exploring how e-learning affects the quantifiable external performance of the low-SES group in developing countries, there is a paucity of research exploring how the low-SES group cognitively and psychologically ingests knowledge through e-learning. Besides, studies conclude that distance learning negatively impacts low-SES groups and attributes it to social factors, with little focus on psychological or mental causes on an individual level. The results of this study provide insight into potential future routes for practice and research on the influences of remote learning on specific populations.

**Keywords:** E-learning impact, Low-SES group, Cognitive and psychological perspectives.

## **1. Introduction**

With the continuous advancement of technology and the development of user experience, we can expect the diversification of content and technology in the field of live streaming. However, the lack of quality content has led to uneven levels of teaching. Online education provides low-cost learning opportunities for children from low-income families, enabling them to access more quality education resources and helping to upgrade their human capital and skill levels, thereby increasing future job competitiveness and income opportunities. In addition, online education breaks geographical restrictions, allowing children from low-income families in rural or remote areas to contact the wider world and broaden their horizons. At the same time, helping them to study independently without supervision is also one of the ways that online education can provide flexible learning time for children from low-income families.

However, the UNESCO (United Nations Educational) Director-General highlighted the twin crises of inequality in education and well-being exacerbated by COVID-19, armed conflict, climate change, and growing food shortages in 2019. These heart-wrenching statistics about out-of-school students and unwanted pregnancies support this claim. In addition, more and more young people are falling into depression and heightened stress due to worries about their future prospects. Further increasing pressure on health and overall well-being is leading to a surge in school dropouts and a shortage of

qualified educators. However, UNESCO (United Nations Educational) says most countries are using digital distance learning to ensure continuity of education in the face of school closures caused by COVID-19. But of the 826 million students suspended, 43 percent do not have a computer device or Internet connection. Inequality is particularly high in low-income countries.

To this extent, we frame our research questions as follows:

1. What studies have been conducted concerning the impact of distance education on low-SES populations in developing countries?
2. To what extent and in what ways does existing research engage with the influence of online learning on the education of low SES communities in developing countries?

Remote learning has become an integral part of modern education [1], particularly in the wake of the COVID-19 pandemic. Students from low socioeconomic status (SES) backgrounds often face unique challenges in remote learning environments, such as limited access to technological resources, inadequate support, and environmental distractions [2]. This theoretical framework aims to explore the application of behaviorism and cognitivism in remote learning and their potential impact on the academic achievement, motivation, and engagement of low SES students.

### 1.1. Behaviorism

Behaviorism, as proposed by B.F. Skinner emphasizes the role of environmental factors in shaping behavior [3]. It suggests that learning occurs through operant conditioning, where the consequences of actions influence the likelihood of repeating those actions [4]. In the context of remote learning, behaviorist principles can be applied by:

- Establishing clear expectations and rules: Remote learning environments may lack the structure and predictability that traditional classrooms provide [5]. By clearly outlining expectations and rules for virtual classroom behavior, educators can help students from low SES backgrounds feel more secure and focused on their learning goals.
- Providing immediate feedback and rewards: Positive reinforcement plays a critical role in motivating and engaging students [6]. In remote learning settings, educators can use digital tools to provide immediate feedback and rewards, which can encourage low SES students to actively participate in learning activities and improve their performance.
- Utilizing digital tools for tracking and monitoring progress: Learning management systems, educational apps, and other digital tools can help educators collect and analyze data on student progress [7]. This data-driven approach enables teachers to identify learning gaps, adjust instructional strategies, and provide targeted support for low SES students who may be struggling in remote learning environments.
- Developing a sense of structure and predictability: Low SES students may experience instability and distractions in their home environments, which can negatively impact their remote learning experiences [8]. By applying behaviorist principles, educators can create a more structured and predictable learning environment, fostering a greater sense of security and focus among these students.

### 1.2. Cognitivism

Cognitivism focuses on mental processes and how individuals actively construct knowledge [9]. Jean Piaget and Lev Vygotsky's theories highlight the importance of cognitive development and social interactions in learning [10]. Remote learning strategies rooted in cognitivism include:

- Scaffolding instruction: According to Piaget's theory, cognitive development occurs in stages, with learners requiring appropriate support to progress through these stages. Scaffolding involves

providing temporary assistance to help students grasp new concepts and skills [11]. For low SES students in remote learning environments, scaffolding can address specific challenges and bridge learning gaps.

- Connecting new knowledge to prior experiences: Cognitivism recognizes that learners construct new knowledge by building upon their existing understanding [12]. By helping low SES students make connections between their personal experiences and new concepts, educators can enhance comprehension and retention.
- Encouraging collaborative learning: Vygotsky's theory highlights the significance of social interactions in cognitive development [13]. In remote learning settings, educators can promote collaborative learning through group discussions, peer interactions, and cooperative projects. These experiences can benefit low SES students by providing opportunities to learn from their peers and develop social skills.
- Developing metacognitive skills: Metacognition refers to the ability to reflect on one's thinking and learning processes [14]. By promoting metacognitive skills in remote learning environments, educators can support low SES students in becoming more self-regulated learners, enabling them to better navigate the unique challenges of remote learning.

### 1.3. Implications for low SES students

Incorporating behaviorist and cognitivist principles into remote learning can provide valuable support for low SES students by:

- Fostering structure and predictability to counteract potential instability in home environments
- Enhancing motivation through positive reinforcement and feedback
- Encouraging social interactions and collaboration with peers
- Developing metacognitive skills to promote self-regulated learning

By considering the unique challenges faced by low SES students in remote learning contexts, educators can adapt and apply behaviorism and cognitivism to improve academic and emotional outcomes [15]. Future research may investigate the effectiveness of these approaches for specific subgroups within the low SES population and explore additional strategies to better support these students in remote learning environments.

## 2. Methods

*Literature Search.* We initiated our systematic literature review by conducting a thorough search within the EBSCO database, employing a carefully crafted combination of keywords and subject headings pertinent to our research, as outlined in Table 1. This strategy aimed to ensure the inclusion of relevant literature by utilizing the Boolean operator "OR" to link keywords, while "AND" was employed to combine different subject classifications. Our search focused on manuscripts published between January 2005 and December 2023, resulting in the identification of 252 relevant studies. All identified studies were then imported into the systematic review software Covidence for subsequent processing.

Table 1: Examples of search terms used in EBSCO database

Search Term Category (Joined with AND)	Search Terms in Abstract (Joined with OR)
Online learning	“web-based learn*” OR “online learn*” OR “online train*” OR e-learn* OR “virtual learn*” OR “digital educat*” OR “online educat*” OR “distance learn*” OR “distance educat*” OR “remote learn*” OR “education tech*” OR EdTech* OR “virtual class*” OR “online stud*” OR LMS* OR Toppr

Table 1: (continued)

	* OR BYJU’S* OR Vedantu* OR VLE*
Low Socioeconomic Status	“Disadvantage background*” OR “low-income*” OR “economic disadvantage*” OR poverty* OR “socioeconomic challenge*” OR “financial hardship*” OR “low-income family*” OR “resource scarcity*” OR “financial struggle*” OR “economic hardship*” OR “marginalized community*” OR underprivileged* OR “low socioeconomic*” OR “low SES*” OR “life quality*” OR “living wage*” OR “wealth gap*” OR “income inequality”
Developing Countries	India* OR China* OR “South Korea*” OR Malaysia* OR Thailand* OR Egypt* OR Nigeria* OR Kenya* OR “South Africa*” OR Brazil* OR Mexico* OR Argentina* OR Afghanistan* OR Indonesia* OR Pakistan* OR Bangladesh* OR Russia* OR Ethiopia* OR Philippines* OR Congo* OR Vietnam* OR Iran* OR Turkey* OR Tanzania* OR Myanmar* OR Colombia* OR Uganda* OR Sudan* OR Cambodia* OR “developing country*” OR “developing nation*” OR “third world*” OR “Southeast Asia*” OR “South Asia*” OR Africa* OR “South America*” OR “Middle East”

*Literature Screening.* During our screening process, Covidence automatically identified and removed 1 duplicate entry. Three reviewers then examined the remaining 251 studies by evaluating their titles and abstracts, applying the following exclusion criteria to eliminate certain articles:

1. Studies must be about education in developing countries.
2. The research object should mainly focus on low-SES groups or individuals in underdeveloped areas as a whole. Middle-class or groups that are not identified with socioeconomic status were excluded.
3. Studies ought to be specifically about the impact on low-SES groups with the use of technology in education, especially online education or online training; for example, the coverage of educational technology in low-SES areas was excluded.
4. Only studies focusing on the impact on low-SES groups were included, excluding those focusing on the impact on society.
5. Eligible studies must be written either in English or Chinese.

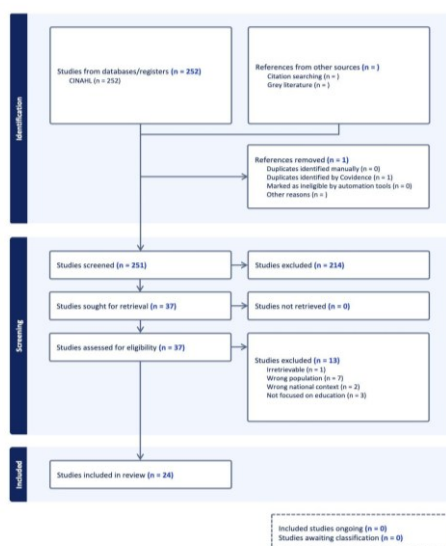


Figure 1: PRISMA diagram of the identification process through covidence

As shown in our PRISMA flow diagram (see Figure 1), all disputes amongst coders were settled by discussion, and 214 articles were eliminated during our first screening procedure, leaving 37

articles for full-text evaluation. Full texts were obtained from many databases and examined by the same group of coders, who once more deliberated over every issue before reaching a resolution. 13 more studies were disqualified due to irregularities with our criteria, including wrong population, wrong national context, not focused on education and irretrievable situation. Ultimately, 24 papers were found to be worthy of in-depth examination and additional research.

*Literature Analysis.* After screening the research, we continue with the extraction stage of analysis. These data are encoded in multiple steps, so that we can analyze the systematic literature review on how remote learning affects low socio-economic status communities in developing countries. Firstly, we will determine whether online learning in developing countries covers low-income populations and whether it has an impact on these groups. Secondly, we investigated the impact of online learning on low-income groups, using three types of labels: (1) whether to study online learning. (2) Does it have an impact on low-income groups? (3) Is it a developing country (see Table 1). We design categories based on whether research on online education focuses on influencing low-income populations in developing countries. In the next stage of research, we defined the research framework by first determining whether the study is based on behaviorism, cognitive constructivism, or socio-cultural factors and then categorizing whether the time frame of the study was during the pandemic. Finally, we investigate the impact of distance learning on communities with low socio-economic status in developing countries and its causes. Based on the first point, we will divide the research into (1) learning outcomes from a behaviorist perspective. (2) As a personal theme in the classroom. (3) Not included as a personal topic in the classroom (see Table 2). The reason is that we observed during the screening process that the impact of distance education on this group of people is more based on behaviorism [16].

Table 2: How to measure individuals' learning outcomes

Category of analysis	Definition	Example	Distribution of articles	Number of articles
Investigate Learning Outcomes from a Behaviorist perspective	The study considered grades/scores, classroom performance (participation), habits, enrollment rate, etc. as criteria for judging the learning outcomes of low-SES communities.	An example of this type of criteria is manifested in the paper of Wolf et al. using Literacy and math test scores including three sub-tasks measuring oral vocabulary, spelling, and, oral comprehension as measures for students' learning outcomes.	66.67%	16
Investigate Learning Outcomes from a Cognitive perspective	The study considered individuals' mindset and/or the processing of understanding knowledge in people's brain as criteria for judging the learning outcomes of low-SES communities.	An example of this type of criteria is exemplified by Sögüt et al., who collect data on learning effectiveness by preparing questionnaires containing questions on satisfaction with distance education and views on distance education.	8.33%	2
No Explicit or Implicit Outcomes Shown	The study does not contain any conclusions about the magnitude and effectiveness of distance education for the low-SES group.	/	25%	6

### 3. Hypothesis

1. A large number of studies on online education have been limited to the COVID-19 period, but the impact of many online education platforms is assumed to be continuing acting on the low-SES population even after the epidemic.

2. Most studies have examined the performance of people from different SES groups in online education from the perspective of behaviorism (statistics on class grades, class habits, etc.), but no study has explored what's happening inside the brain of a learner from low-SES communities or comparative studies with high-SES populations on the level of cognitivism.

a. Theoretical framework: behaviorism and cognitivism

3. In the studies that concluded that distance learning has a negative impact on the low-SES group, most of the scientific research attributed it to objective reasons such as lack of hardware and equipment, poor digital literacy, etc., and lack the exploration of the reasons on the psychological and mental level.

a. Theoretical framework: cognitivism

#### 3.1. Extraction code:

1. Examined online education specifically and solely during the COVID-19 period/non-epidemic period/both.

2. Examined the performance of people from low-SES groups based on their grades and performance in class/understanding of knowledge inside their mind/both.

3. Analyze reasons of distance education has a negative impact on low-SES groups from objective material deprivation/psychological realm/both.

### 4. Findings

Our research aims to examine two primary questions: (1) how existing studies measure the impact of distance education on low-SES groups and (2) the underlying causes of these impacts.

First, we categorized the literature by time frame and found that 43% of the studies focused exclusively on the COVID-19 period. (see Figure 2)

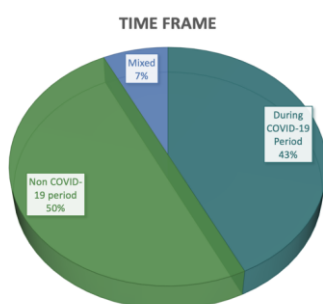


Figure 2: PRISMA diagram of the identification process through covidence

In terms of measuring learning outcomes, 66.67% of the literature applied a behaviorist approach, focusing on metrics such as grades, classroom participation, and learning habits. In contrast, only 8% of studies explored cognitive perspectives, analyzing learning outcomes in terms of how knowledge is constructed and understood by individuals. This imbalance indicates a significant gap in the literature, particularly in terms of understanding the deeper cognitive processes involved in learning among low-SES groups. (see Table 2).

Additionally, we observed that among the studies concluding that distance education has a negative impact on low-SES groups, all attributed these negative outcomes to structural injustices - such as societal inequalities or historical disadvantages. However, only one study focusing on Semi-private space and access to online education during COVID-19 in China addresses the role of individual factors like family composition in contributing to these negative impacts. To be specific, one of the prominent findings is that “Fathers’ guardianship has a negative impact on students’ access to online education.” [17]. But still, reasons behind the father being the primary guardian can lead to a lack of access to remote education. We have no means of knowing whether it is the psychological factors and personal experiences of the child molded by the upbringing or the material conditions that prevent the child from participating in remote education. (see Table 3)

This highlights the need for more nuanced analyses that consider both systemic and individual-level factors on the effectiveness of distance education for marginalized populations.

Table 3: Overview of outcomes and their cause

Study	Author, Date	Impact on Low-SES Groups	Scope of the Cause
THE DIGITAL DIVIDE AND HIGHER EDUCATION CHALLENGE WITH EMERGENCY ONLINE LEARNING: ANALYSIS OF TWEETS IN THE WAKE OF THE COVID-19 LOCKDOWN.	Aziona&Nhedzi, 2021	Negative	Social Level
An Exploratory Study of Online Postsecondary Education for Low-Income Working Adults: A View from Education Support Programs.	Benson, 2007	Positive	Individual Level
Blended learning to improve the quality of primary education among underprivileged school children in India.	Dey & Bandyopadhyay, 2018	Positive	Social Level & Individual Level
Online medical education: A student survey.	Gu, 2021	Negative	Social Level
Unequal experience of COVID-induced remote schooling in four developing countries.	Hossain, 2021	Negative	Social Level & Historical/Conceptual Level
Open and Distance Learning Programs for Nursing and Midwifery Education in East Africa: Protocol for a Scoping Review.	Wendland, 2012	Negative	Social Level & Historical/Conceptual Level
Pandemic-Led Challenges for Rural Students in Bangladesh.	Islam et al., 2023	Negative	Social Level & Historical/Conceptual Level
Poverty Alleviation through Access to Education: Can E-Learning Deliver?	Khan & Williams, 2006	Positive	Social Level
Distance Education's Impact During Economic Hardship: How Distance Learning Impacts Educational Institutions and Businesses in Times of Economic Hardship.	Larson & Murray, 2007	Not mentioned	Social Level
Who Gets the Highest Return to Distance Higher Education?	Wang & Li, 2023	Positive	Social Level
Can distance education increase educational equality? Evidence from the expansion of Chinese higher education.	Li et al., 2013	Negative	Social Level & Historical/Conceptual Level
The Socioeconomic Context of Home-Based Learning by Women in Malaysia.	Loh-Ludher, 2007	Positive	Social Level & Historical/Conceptual Level
The dark side of online home-schooling after COVID-19 in Sri Lanka	Suheera & Wazeema, 2022	Negative	Social Level & Historical/Conceptual Level
Impact of educational and gender inequality on income and income inequality in South Asian countries.	Munir & Kanwal, 2020	Negative	Social Level & Historical/Conceptual Level
Inequalities in access to education and healthcare.	Nunn et al., 2008	Positive	Social Level & Historical/Conceptual Level
Perspectives on STEAM Education during the COVID-19 Pandemic at an Underprivileged Elementary School in Thailand.	Phonnong & Keeratchamrorn, 2023	Positive	Not Mentioned
Skills for Development: A Study of Vocational Programme in Livestock and Poultry through Distance Mode.	Rahman, Abu Nasar Md. Aminoor et al., 2005	Negative	Social Level & Historical/Conceptual Level

Table 3: (continued)

Distance Education for Social Development in Bangladesh.	Shelley et al., 2011	Positive	Social Level & Historical/Conceptual Level & Individual Level
The Relationship Between eHealth Literacy and Self-Efficacy Levels in Midwifery Students Receiving Distance Education During the COVID-19 Pandemic.	SOGUT, Seda et al., 2013	Negative	Social Level
Online Learning on the Covid-19 Pandemic to Create Educational Access Inequality.	JSubur, 1993	Negative	Social Level
FUTURE-PROOFING IMPERATIVES FOR REMOTE ONLINE TEACHING, LEARNING AND STUDENT SUPPORT IN THE CONTEXT OF PANDEMIC CHANGE AND BEYOND: A CASE FOR SOUTH AFRICAN HIGHER EDUCATION TRANSFORMATION.	D & P, 2022	Positive	Social Level & Historical/Conceptual Level
Remote learning engagement and learning outcomes during school closures in Ghana.	Wolf et al., 2022	Negative	Social Level
Semiprivate space and access to online education during COVID-19: empirical tests from China.	Jiafeng Gu	Negative	Social Level & Individual Level
Distance Learning as a Tool for Poverty Reduction and Economic Development: A Focus on China and Mexico.	Richard C. Larson, and M. Elizabeth Murray	Positive	Social Level & Historical/Conceptual Level

## 5. Discussion

Our research paper is poised to make a significant and impactful contribution to the field of Learning Management Systems (LMS) by addressing two crucial and often overlooked areas. First, we fill a critical knowledge gap by shifting the focus from traditional, quantifiable metrics like grades and classroom performance to a Cognitivist perspective that deeply explores how learners internalize knowledge. The majority of existing research tends to prioritize measurable outcomes, often neglecting the nuanced internal processes that are vital to understanding true learning. By emphasizing this internalization, our work offers a more holistic view of the learning experience, which is essential for advancing both theory and practice in educational research.

Secondly, we advocate for a stronger emphasis on micro-narrative research. While structural injustices in education, particularly those affecting low-SES groups, have been well-documented, the individual journeys and personal experiences of learners are often underrepresented. By bringing these narratives to the forefront, we enable a more in-depth exploration of the negative impacts of current learning systems on marginalized populations. This approach not only adds richness to the existing body of research but also reinforces the Cognitivist perspective, providing a more scientifically rigorous and pragmatic foundation for educational reforms. In this way, our research broadens the scope of inquiry and opens new avenues for understanding the complex dynamics of learning in diverse contexts.

## 6. Conclusion

Our systematic literature review highlights significant findings regarding the impact of remote learning on low-socioeconomic status (SES) communities in developing countries. Primarily, we observed that existing research heavily favors behaviorist frameworks, focusing on quantifiable metrics such as grades and participation while largely neglecting cognitive processes, such as knowledge internalization and psychological factors. This gap underscores the need for a more comprehensive approach that includes cognitivist perspectives to better understand and address the learning experiences of these marginalized populations.

The implications of our findings are profound. They advocate for a paradigm shift in both research and practice. Addressing systemic barriers, such as access to technology and digital literacy, remains critical. However, equally vital is exploring individual-level psychological and cognitive factors that

influence learning outcomes. Future studies should strive to incorporate micro-narrative methodologies to capture the nuanced, personal experiences of learners from low-SES communities, fostering a holistic understanding of the challenges they face.

By bridging these gaps, our work not only enriches the theoretical landscape of remote learning research but also provides actionable insights for educators, policymakers, and technologists. These insights aim to create equitable, effective educational environments that empower learners from disadvantaged backgrounds, contributing to a more inclusive global education system.

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