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Impact of virtual education on English learning in Ecuadorian basic education students

Impacto de la educación virtual en el aprendizaje del inglés en estudiantes de básica ecuatoriana

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ABSTRACT

Virtual education reached Ecuadorian schools in March 2020 without enough devices or trained teachers, since English learning became dependent on each household's connectivity. The study therefore aimed to analyze the impact of virtual education on English learning in Ecuadorian basic education students. A descriptive, documentary and comparative methodology was used, taking as corpus 25 sources (2012-2025) contrasted through matrices by country, level, technology and outcome. The results showed that digital tools produce positive effects under planned conditions, while in Ecuador the lack of devices, unstable connections and scarce interaction limited oral practice. It was concluded that the impact depends less on the platform than on access, teacher mediation and family support.

Descriptors: e-learning; second language instruction; English; primary education. (Source: UNESCO Thesaurus).

RESUMEN

La educación virtual llegó a las escuelas ecuatorianas en marzo de 2020 sin equipos suficientes ni docentes preparados, por cuanto el aprendizaje del inglés quedó sujeto a la conectividad de cada hogar. Es así que el estudio se planteó como objetivo analizar el impacto de la educación virtual en el aprendizaje del inglés en estudiantes de básica ecuatoriana. En este sentido se empleó una metodología descriptiva, documental y comparativa, teniéndose como corpus 25 fuentes (2012-2025) contrastadas mediante matrices por país, nivel, tecnología y resultado. Entre los resultados se obtuvo que las herramientas digitales producen efectos positivos en condiciones planificadas, mientras en Ecuador la falta de dispositivos, la conexión irregular y la escasa interacción limitaron la práctica oral. Entre las conclusiones se estableció que el impacto depende menos de la plataforma que del acceso, la mediación docente y el acompañamiento familiar.

Descriptores: aprendizaje en línea; enseñanza de una segunda lengua; inglés; enseñanza primaria. (Fuente: Tesauro UNESCO).

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Research Articles Section

INTRODUCTION

When Asanov et al. (2021) interviewed more than 1500 Ecuadorian students aged 14 to 18 by telephone during the 2020 quarantine, they found that only 59% had both internet access at home and a computer or tablet, although 74% participated in some form of online or television-based learning and 16% had scores consistent with depression, so that virtual schooling worked for some and only partially reached others. In line with these data, Cárdenas-Tapia et al. (2022) surveyed 6206 mothers, fathers and guardians of primary and secondary students and recorded that 54% of families with three children had only two mobile devices, a proportion that rose to 90% in households with four children that had three devices or fewer.

For its part, English entered the pandemic with prior disadvantages, since the 2016 curriculum had extended its teaching to general basic education (Ministerio de Educación del Ecuador, 2016) without solving the problems that Calle et al. (2012) had documented among 168 teachers in public schools in Cuenca, including traditional strategies, a teacher-centered approach and little interaction in the target language. In fact, Alvarez et al. (2025) surveyed 113 English teachers in public primary schools and found that 80% considered class hours insufficient, the same percentage stated that students lack access to technology and 70% judged the Ministry's resources unsatisfactory.

At the international level, research on computer-assisted language learning has accumulated decades of results, and Grgurović et al. (2013) brought together 37 studies with 52 effect sizes to conclude that technology-supported instruction produces a small, positive and significant effect, at least equal to that of instruction without it. However, these studies were conducted under planned conditions, with available equipment and trained teachers, whereas virtual education in 2020 was an emergency response, which raises the question of whether the accumulated evidence can explain what happened in Ecuador's basic education classrooms.

But what impact did virtual education really have on the English learning of children and adolescents in basic education, when the class depended on a shared phone and an intermittent connection? Based on the above, the research aims to analyze the impact of virtual education on English learning in Ecuadorian basic education students.

METHOD

The methodology used is descriptive, documentary and comparative, since the findings of published studies were described, the work was carried out exclusively with documents and the results were contrasted according to country, educational level, technology used and learning outcome. Accordingly, a corpus of 25 sources published between 2012 and 2025 was assembled, of which 24 are articles in peer-reviewed journals and one is Ecuador's official English curriculum, as summarized in Table 1.

Table 1. *Protocol of the comparative documentary review*.

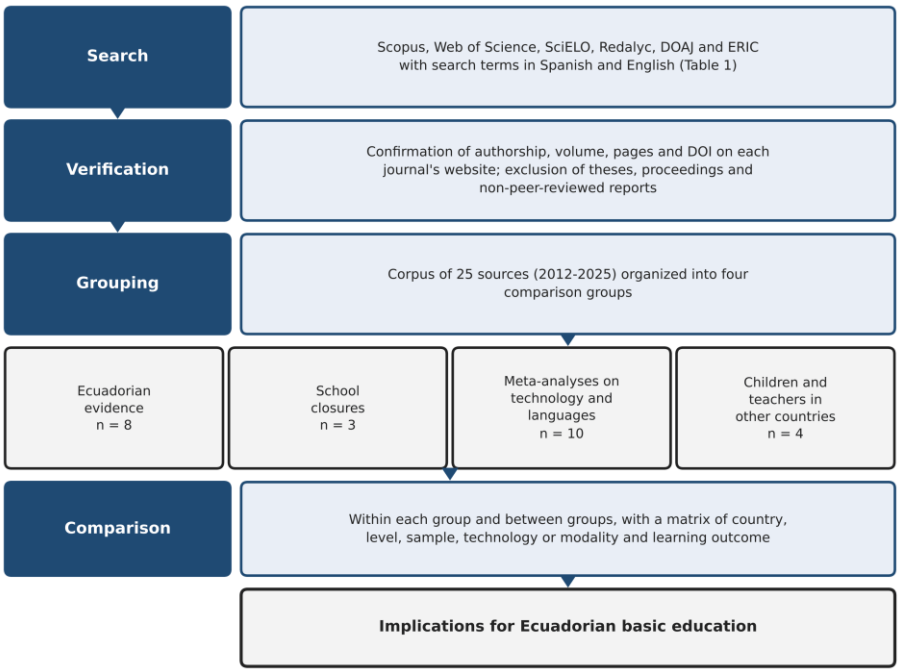
Element	Description
Type of study	Descriptive, documentary and comparative
Databases consulted	Scopus, Web of Science, SciELO, Redalyc, DOAJ and ERIC; website of Ecuador's Ministry of Education
Search terms	("educación virtual" OR "online learning" OR "emergency remote teaching" OR "CALL" OR "MALL") AND ("inglés" OR "English" OR "EFL") AND ("Ecuador" OR "young learners" OR "primary" OR "COVID-19")
Period	2012-2025
Inclusion criteria	Peer-reviewed articles with a DOI or verifiable record; studies on virtual or technology-based English teaching, or on learning during school closures; official Ecuadorian curriculum
Exclusion criteria	Theses, conference proceedings, non-peer-reviewed reports, press, blogs, non-peer-reviewed or predatory journals and duplicate records
Comparison groups	Ecuadorian evidence (n = 8); learning during school closures (n = 3); meta-analyses and reviews on technology and languages (n = 10); children and teachers in other countries (n = 4)
Comparison criteria	Country, educational level, sample, technology or modality and learning outcome

Note: developed in-house.

Regarding the procedure, the search was carried out in Scopus, Web of Science, SciELO, Redalyc, DOAJ and ERIC, and each record was verified on the journal's website to confirm authorship, volume, pages and DOI, while theses, conference proceedings, non-peer-reviewed reports and journals of doubtful editorial quality were discarded. Subsequently, the corpus was organized into four comparison groups, namely Ecuadorian evidence on virtual English teaching, studies on learning during school closures, meta-analyses and reviews on technology and languages, and international studies with children and English teachers in remote teaching.

Therefore, the comparison was carried out first within each group and then between groups, to contrast what international research attributes to technology with what Ecuadorian studies report, so that the implications for basic education are presented as the authors' inference from this triangulation. Figure 1 represents the route followed.

Figure 1. *Route of the comparative documentary review*.



Note: developed in-house.

RESULTS

What the Ecuadorian evidence shows

Studies conducted in the country agree in identifying access as the first barrier, and Caizaluisa-Alvarado et al. (2022) documented this by interviewing eight English teachers from seven institutions, four public and three private, during the 2020-2021 school year. According to their testimonies, classes were sustained with Microsoft Teams, WhatsApp, Google Classroom and Zoom, materials were prepared in PowerPoint and Prezi and assessments in Google Forms, while songs, games, videos and arts-and-crafts activities sought to hold the children's attention, although connectivity, lack of preparation, the few hours of English and scarce parental support limited the reach of these strategies.

At the university level, Sevy-Biloon (2021) observed 20 intermediate-level virtual English classes at the Universidad Nacional de Educación over one semester and found that between 60% and 90% of students kept their cameras off and only about half participated actively, so that about 70% of the 69 pre-service teachers consulted preferred to return to face-to-face classes. Likewise, Argudo-Serrano et al. (2023) surveyed 703 English students at the Universidad de Cuenca and recorded significant levels of engagement in online classes, which indicates that motivation did not disappear, although the conditions for practicing the language authentically were reduced.

This invites reflection on a paradox, since if university students with greater autonomy turned off their cameras and avoided speaking, it can be assumed that basic education children, who depended on an adult to connect, had even fewer opportunities for oral production in English. Table 2 brings together the comparison for this group and Figure 2 gathers the indicators that the corpus offers on the conditions of virtual education in the country.

Table 2. *Comparison of Ecuadorian evidence on virtual education and English*.

Study	Level	Sample	Finding
Calle et al. (2012)	Public schools in Cuenca	168 teachers surveyed	Traditional strategies and little interaction in English
Asanov et al. (2021)	Secondary	More than 1500 students	59% with internet and a computer; 74% in remote education
Sevy-Biloon (2021)	University (UNAE)	69 students; 20 classes observed	About 70% prefer face-to-face classes; cameras off
Caizaluisa-Alvarado et al. (2022)	Basic and upper secondary	Eight teachers from seven institutions	Barriers of connectivity, hours and family support
Cárdenas-Tapia et al. (2022)	Primary and secondary	6206 mothers, fathers and guardians	Fewer devices than children in online classes
Argudo-Serrano et al. (2023)	Universidad de Cuenca	703 English students	Significant engagement in online classes
Alvarez et al. (2025)	Public primary	113 teachers; 12 interviews	80% report lack of access to technology and insufficient hours

Note: developed in-house from the corpus reviewed; the eighth document in the group is the 2016 English curriculum.

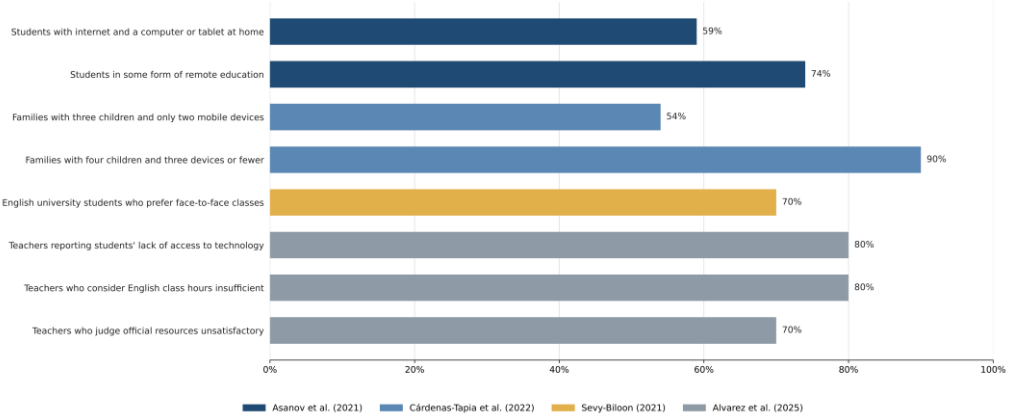


Figure 2. *Indicators on the conditions of virtual education and English in Ecuador*. **Note:** developed in-house from Asanov et al. (2021), Sevy-Biloon (2021), Cárdenas-Tapia et al. (2022) and Alvarez et al. (2025).

What is known about learning during school closures

Second, research on general learning during the pandemic makes it possible to gauge the scale of the problem, and Engzell et al. (2021) showed in the Netherlands, a country with high connectivity, that eight weeks of closure produced a loss of about 3 percentile points, equivalent to 0.08 standard deviations, with losses up to 60% greater among students from less-educated homes. In turn, Betthäuser et al. (2023) brought together 42 studies from 15 countries in a meta-analysis published in *Nature Human Behaviour* and estimated an overall deficit of d = -0.14, more pronounced among students of low socioeconomic status and in middle-income countries, the group to which Ecuador belongs.

In Latin America, Lichand et al. (2022) compared the results of secondary students in the state of São Paulo before and during remote education and found that the risk of dropout increased by 365% and that grades fell by 0.32 standard deviations, so that students learned about 27.5% of what they would have learned in face-to-face classes. This indicates that the impact of virtual education on English cannot be separated from the general impact of school closures, which in the region were longer and more unequal than in the countries where most of the research originates.

What meta-analyses say about technology and languages

On the other hand, accumulated research on technology and language learning offers favorable results when the conditions are in place, and Golonka et al. (2014) reviewed the types of technology used in foreign language teaching and concluded that the strongest evidence supports chat and computer-mediated communication for oral production, while other tools lacked rigorous studies. Along these lines, Lin (2015) analyzed 25 studies on computer-mediated communication and found a moderate positive effect on second language oral proficiency compared with face-to-face interaction or no interaction.

With regard to mobile devices, Burston (2015) examined 291 studies of language learning with phones and tablets and found that only 35 met minimum conditions of duration and sample size and that just 19 had a reliable design, of which 15 reported positive results. Later, Chen et al. (2020) confirmed, in a meta-analysis published in *Educational Technology Research and Development*, the favorable effect of mobile devices on language learning, while Hwang & Fu (2019) noted that most of these studies focus on vocabulary and on university students, with little presence of primary education.

As regards games, Hung et al. (2018) reviewed research on digital game-based language learning and found favorable effects on motivation and vocabulary, while Lee & Baek (2023) brought together eleven Korean studies with 610 participants and obtained a mean effect of g = 0.517 of gamification on English proficiency, higher in primary school (g = 0.801) than in

secondary school (g = 0.624) or at university (g = 0.270). Similarly, Yu (2023) compared, in Beijing, 35 students who learned vocabulary with a gamified application with 36 who used printed dictionaries and obtained favorable differences in outcomes, motivation and satisfaction. Finally, Plonsky & Ziegler (2016) synthesized previous meta-analyses and warned that effects vary according to technology, skill and the quality of the research design. Table 3 summarizes this comparison.

Table 3. *Comparison of meta-analyses and reviews on technology and language learning*.

Study	Corpus analyzed	Technology	Result
Grgurović et al. (2013)	37 studies; 52 effect sizes	Computers in general	Small, positive and significant effect
Golonka et al. (2014)	Review by type of technology	Various	Strongest support for chat in oral production
Burston (2015)	291 studies; 19 reliable	Mobile devices	15 of 19 with positive results
Lin (2015)	25 studies	Computer-mediated communication	Moderate effect on oral proficiency
Plonsky & Ziegler (2016)	Synthesis of meta-analyses	CALL	Variable effects by technology and design
Hung et al. (2018)	Scoping review	Digital games	Supports motivation and vocabulary
Hwang & Fu (2019)	Publications 2007-2016	Mobile learning	Little research in primary education
Chen et al. (2020)	Meta-analysis	Mobile devices	Favorable effect on learning
Lee & Baek (2023)	11 studies; 610 participants	Gamification	g = 0.517; primary g = 0.801
Yu (2023)	71 university students	Gamified application	Better outcomes, motivation and satisfaction

Note: developed in-house from the corpus reviewed.

What studies with children and teachers in other countries show

As for remote teaching with children, Kałdonek-Crnjaković (2022) interviewed four novice English teachers in Warsaw, two from a public primary school and two from a private language school, and found that online classes were reduced to 30 minutes compared with 45 face-to-face, that shyer children communicated better through chat, and that shared devices, screen fatigue and lack of support for students with special educational needs affected the process. Likewise, Moorhouse & Wong (2022) surveyed 73 primary and secondary English teachers in Hong Kong and recorded that 57% combined synchronous and asynchronous sessions, while 43% worked only asynchronously, which is why they proposed a sequence that alternates both modalities.

Nevertheless, the experience of Colombia shows that virtual learning can also open opportunities, since Cohen & Calderón-Aponte (2021) organized four synchronous sessions via Google Meet between English students at a Colombian public university and pre-service teachers at a U.S. university, and eight of the ten participants who answered the questionnaire considered them relevant to their goals, although unstable connections, power outages and shared homes made the meetings difficult. Butler (2015), reviewing a decade of research on English for children in East Asia, recalls that an early start does not guarantee better results if exposure time and the quality of interaction are insufficient, a warning that carries more weight when the class is reduced to a screen.

Conditions that explain the impact in Ecuadorian basic education

Thus, the comparison between groups makes it possible to establish that technology did not by itself produce the observed impact, since the positive effects reported in meta-analyses depend on conditions that were not guaranteed in Ecuador in 2020, such as individual access to a device, a stable connection, teachers trained in digital pedagogy and sufficient time for interaction in the language. Table 4 contrasts these conditions with national and international evidence and derives implications for basic education, while Figure 3 represents, as the authors' inference, the relationship among access, mediation and learning outcomes.

Table 4. *Conditions of the impact of virtual education on English and implications for basic*

education.

Condition	Ecuadorian evidence	International evidence	Implication for basic education
Access to devices	Fewer devices than children in class (Cárdenas-Tapia et al., 2022)	Shared devices affect children (Kałdonek-Crnjaković, 2022)	Ensure one device per student or planned shifts
Connectivity	59% with internet and a computer (Asanov et al., 2021)	Connection and power outages (Cohen & Calderón-Aponte, 2021)	Lightweight, downloadable materials for mobile data
Class time	Insufficient hours for 80% of teachers (Alvarez et al., 2025)	30-minute classes compared with 45 (Kałdonek-Crnjaković, 2022)	Combine short synchronous sessions with asynchronous tasks
Oral interaction	Cameras off and low participation (Sevy-Biloon, 2021)	Moderate effect of mediated interaction (Lin, 2015)	Speaking turns in small groups and guided chat
Teacher training	Lack of preparation for virtual teaching (Caizaluisa-Alvarado et al., 2022)	Sequences that blend modalities (Moorhouse & Wong, 2022)	Training in digital pedagogy for children
Motivation	Sustained online engagement (Argudo-Serrano et al., 2023)	Gamification with a greater effect in primary school (Lee & Baek, 2023)	Games and applications with a learning purpose
Family	Different support in rural and urban areas (Cárdenas-Tapia et al., 2022)	Greater parental involvement at home (Kałdonek-Crnjaković, 2022)	Activities that guardians can support

Note: developed in-house from the corpus reviewed.

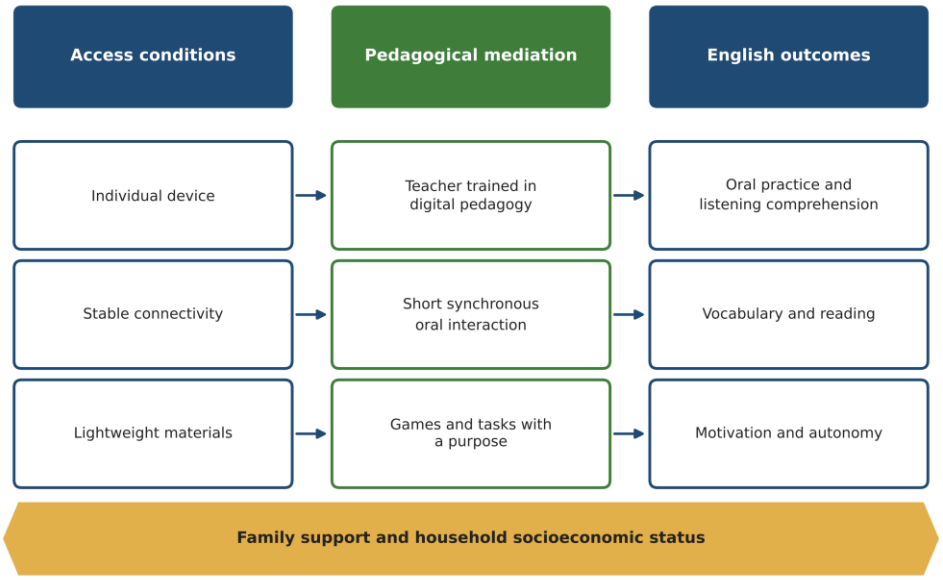


Figure 3. *Conditions that mediate the impact of virtual education on English learning in basic education*. **Note:** developed in-house from the corpus reviewed.

Another aspect that should be examined is the role of the family, since in basic education children

do not connect on their own, and Cárdenas-Tapia et al. (2022) observed that in rural areas parents focused on discipline and completing homework, while in urban areas they paid more attention to academic and emotional support, which suggests that support in English also depended on the cultural capital of each household. Hence an intrinsic challenge for institutions, which is to design activities that guardians can support even if they do not speak the language.

Consequently, the experience of virtual education leaves lessons that remain valid in face-to-face teaching, including the advisability of combining short synchronous moments for oral interaction with lightweight asynchronous materials that work on phones and with mobile data, as Moorhouse & Wong (2022) propose, and that of incorporating games and applications with a defined purpose, whose effects in primary school were greater according to Lee & Baek (2023). In this regard, Alvarez et al. (2025) recall that 80% of public primary teachers feel underprepared for this level, so that any digital proposal requires specific training for teachers of English to children.

CONCLUSIONS

The objective of analyzing the impact of virtual education on English learning in Ecuadorian basic education students was achieved through the comparison of 25 sources covering national evidence, studies on school closures, meta-analyses on technology and languages and research with children and teachers in other countries. In light of the above, technology supports English learning when it is used under planned conditions, with individual access, a stable connection and trained teachers, whereas in Ecuador emergency virtual education took place without these conditions.

The comparison shows that the impact on basic education was uneven, since the lack of devices, irregular connections, reduced class time and scarce oral interaction limited language practice, and that these losses were greater in rural and lower socioeconomic households. This indicates that the impact of virtual education depends less on the platform used than on access, teacher mediation and family support.

Therefore, educational institutions and the Ministry of Education are advised to ensure devices and connectivity for basic education students, to train English teachers in digital pedagogy for children and to design materials that work with low connectivity. Likewise, a challenge for future research is to measure, with standardized tests, the English performance of the cohorts that attended basic education during the pandemic, compared with earlier and later cohorts, in different regions of the country.

FINANCING

Non-monetary.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest with any individuals or institutions related to this research.

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