

## **Bridging the Digital Divide: Exploring the use of ICT in English Language Teaching in Veraguas Secondary Schools.**

### ***Superando la brecha digital: Exploración del uso de las TIC en la enseñanza del idioma inglés en las escuelas secundarias de Veraguas.***

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Artículo recibido: 21 de julio de 2025

Artículo aceptado: 22 de septiembre de 2025

DOI: <https://doi.org/10.48204/j.colegiada.v7n1.a8394>

#### **ABSTRACT**

This study examines the integration of Information and Communication Technologies (ICT) in English language teaching across high schools in Veraguas, Panama. Entitled “*Bridging the Digital Divide: Exploration of ICT Use in English Language Teaching in High Schools in Veraguas*”, the research addresses the extent to which ICT contributes to digital literacy and language learning, while also highlighting persistent inequalities in access and use.

The study employed a survey-based methodology, gathering data from 200 students and 40 English teachers in suburban and rural schools of the province. The survey explored three primary dimensions: availability of ICT resources, teacher preparedness, and the impact of geographic location on access to technological infrastructure. Results indicate a pronounced disparity between urban and rural schools. Urban schools demonstrate greater access to ICT tools and higher levels of teacher digital proficiency, while rural schools continue to face severe limitations in infrastructure and training opportunities. Most teachers reported a pressing need for ongoing professional development to effectively integrate ICT into English language instruction. Similarly, students in rural areas identified limited access to digital resources as a major obstacle, directly influencing their learning outcomes. The study encountered limitations due to extended school closures during a national strike, which delayed data collection. For this reason, it is recommended that data collection resumes in March 2024 with a larger and more diverse sample. Overall, the findings emphasize the importance of reducing the digital divide through sustained investments in ICT infrastructure, continuous teacher training, and policy support from the Ministry of Education (MEDUCA). Addressing these gaps is essential to ensure equitable and effective English language teaching across all regions of Panama.

**KEYWORDS:** information technology, digital competence, digital divide, educational institutions, teachers.



## RESUMEN

Este estudio examina la integración de las Tecnologías de la Información y la Comunicación (TIC) en la enseñanza del idioma inglés en colegios de nivel medio en la provincia de Veraguas, Panamá. Bajo el título *“Reduciendo la brecha digital: exploración del uso de las TIC en la enseñanza del inglés en colegios de Veraguas”*, la investigación analiza en qué medida las TIC contribuyen al desarrollo de la alfabetización digital y al aprendizaje del idioma, al mismo tiempo que pone en evidencia las desigualdades persistentes en el acceso y uso de estas herramientas. La investigación utilizó una metodología basada en encuestas, aplicadas a 200 estudiantes y 40 docentes de inglés pertenecientes a escuelas suburbanas y rurales de la provincia. El cuestionario se enfocó en tres dimensiones principales: la disponibilidad de recursos tecnológicos, la preparación docente y la influencia de la ubicación geográfica en el acceso a la infraestructura tecnológica. Los resultados señalan una marcada disparidad entre escuelas urbanas y rurales. Las escuelas urbanas muestran mayor acceso a herramientas tecnológicas y un nivel más alto de competencia digital docente, mientras que las escuelas rurales enfrentan limitaciones significativas tanto en infraestructura como en capacitación. La mayoría de los docentes manifestó la necesidad de recibir formación continua para integrar eficazmente las TIC en la enseñanza del inglés. De igual manera, los estudiantes de áreas rurales identificaron un acceso limitado a recursos digitales, lo que repercutió directamente en sus resultados de aprendizaje. El estudio se vio limitado por los cierres prolongados de escuelas a raíz de una huelga nacional, lo que retrasó la recolección de datos. Por esta razón, se recomienda reanudar el levantamiento de información en marzo de 2024 con una muestra más amplia y diversa. En conclusión, los hallazgos subrayan la importancia de reducir la brecha digital mediante inversiones sostenidas en infraestructura tecnológica, programas continuos de formación docente y políticas educativas promovidas por el Ministerio de Educación (MEDUCA). Abordar estas carencias resulta esencial para garantizar una enseñanza del inglés equitativa y eficaz en todas las regiones de Panamá.

**PALABRAS CLAVE:** tecnología de la información, competencia digital, Brecha digital, instituciones de enseñanza, docente.

## INTRODUCTION

The integration of Information and Communication Technologies (ICT) into English language teaching and learning has become an essential component of contemporary education worldwide, as governments increasingly invest in digital tools to enhance learning outcomes. In Latin America, Panama has taken important steps toward promoting ICT use in schools to support English language instruction. Nevertheless, persistent challenges remain, particularly in rural regions. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2019), digital inclusion in education is a prerequisite for ensuring equity of access; however, significant disparities continue to shape the Panamanian educational landscape. These inequalities are especially pronounced in provinces such as Veraguas, where limited internet connectivity and restricted access to technological devices contrast sharply with the better-resourced urban areas.

At the national level, policy frameworks such as the *Panama Digital Agenda 4.0* have been introduced to modernize the education system by incorporating ICT and providing digital resources for both teachers and students (Autoridad Nacional para la Innovación Gubernamental [AIG], 2021). Despite these initiatives, the implementation of such policies has been uneven. Urban schools have benefitted disproportionately from technological advances, while rural institutions face barriers that constrain their effective use of ICT. This imbalance undermines student engagement and compromises the effectiveness of English language instruction, given that access to digital resources is a key determinant in fostering language acquisition (Severin and Capota, 2011). Furthermore, teachers in rural schools, particularly in Veraguas, frequently report inadequate professional development in the pedagogical use of ICT, further limiting the impact of these resources (Ministerio de Educación de Panamá, 2020).

Globally, ICT has reshaped educational practices by providing innovative tools and methodologies that enrich English language teaching and learning. Yet, equitable adoption of these technologies remains a pressing challenge, particularly in resource-constrained rural environments. Veraguas, one of Panama's largest provinces, exemplifies this disparity. Its geographic extension and infrastructural limitations hinder the integration of digital resources into classrooms. As Herrera and González (2020) observe, many schools in Veraguas lack even the most basic technological infrastructure such as high-speed internet or adequate computer access that is necessary to implement contemporary teaching practices. Similarly, Safira, Purnamika Utami, and Suwastini (2024) emphasize that inadequate technological conditions in rural schools restrict teachers' capacity to embed ICT in English classrooms, thereby limiting student participation and the development of essential linguistic competencies. In contrast, schools in urban centers benefit from better connectivity and equipment, reinforcing a digital divide that directly influences English learning outcomes.

Crucially, the integration of ICT in English language teaching is not solely dependent on access to digital tools, but also on teachers' ability to employ them effectively. Teacher training is thus a fundamental component of successful ICT implementation (López and Núñez, 2019). In Veraguas, however, many educators report insufficient preparation to use digital resources in pedagogically meaningful ways. This deficit diminishes students' opportunities to engage in interactive and dynamic learning environments, which are essential for acquiring a foreign language (Meskill and Anthony, 2015). Consequently, without both adequate resources and sustained professional development, the transformative potential of ICT in rural English classrooms remains unrealized.

Despite the global emphasis on ICT integration in education, scholarly attention to its application in English language teaching within Panama, particularly in rural high schools, remains limited. Existing studies tend to focus on the broader issue of the digital divide or on urban educational contexts, overlooking the specific realities of rural teachers and learners. This absence of localized research leaves a significant knowledge gap, neglecting key factors such as infrastructural limitations, uneven levels of digital literacy among teachers, and the distinctive needs of geographically dispersed student populations. Addressing this gap is critical for developing contextually relevant strategies that can maximize the benefits of ICT for English teaching and mitigate the inequities faced by rural communities.

The present study aims to examine the impact of ICT integration on English language teaching and learning in rural contexts in Panama, with a particular emphasis on the province of Veraguas. Specifically, it explores how digital tools influence student engagement in the English classroom, while also identifying the challenges teachers face in embedding these technologies into their pedagogical practices. By analyzing these dynamics, the study seeks to contribute to the refinement of national policies so that they better respond to the needs of rural schools. Ultimately, addressing these issues is indispensable not only for enhancing the quality of education but also for equipping Panamanian students with the skills required to thrive in an increasingly competitive, interconnected, and digitally driven world.

## **MATERIALS AND METHODS**

Given the objectives of this research, a survey-based design was adopted, combining quantitative and qualitative components to examine the integration of Information and Communication Technologies (ICT) in English language teaching. While the primary source of data was a structured questionnaire, the instrument incorporated both closed-ended and open-ended items, thereby allowing for the collection of numerical data as well as participants' written reflections. No formal interviews were conducted; instead, qualitative insights emerged from participants' responses to the open-ended items within the survey. This design aligns with Creswell and Creswell's (2017) definition of a mixed-methods approach, where a single instrument can generate complementary data types that are analyzed using both statistical and thematic procedures.

The study was conducted between August 2023 and April 2024 in the province of Veraguas, Panama, with data collected from secondary schools located in the districts of Soná and San Francisco. These sites were selected due to their diverse levels of ICT infrastructure, which allowed for comparative perspectives within rural educational contexts. In total, 200 students and 40 English teachers participated. The students ranged in age from 15 to 18 years, while the teachers reported an average of ten years of professional experience in English language teaching. The inclusion of both groups provided a more comprehensive understanding of ICT integration from the perspectives of learners and educators alike.

The sample frame was limited to ten rural secondary schools; thus, although the study acknowledges the national urban–rural digital divide, the empirical analysis is focused on rural settings in

Veraguas. This focus was deliberate, as Veraguas presents particularly acute challenges in terms of digital access and infrastructure, as documented in prior regional studies (Herrera and González, 2020).

The survey instrument consisted of three sections. The first included demographic items (age, gender, years of teaching experience, school infrastructure). The second section comprised closed-ended questions addressing the frequency of ICT use, access to digital resources, and perceptions of ICT effectiveness in English language teaching and learning. The third section presented open-ended prompts, allowing participants to describe in their own words the benefits, limitations, and challenges of ICT integration. The instrument was adapted from established ICT-education studies (Severin and Capota, 2011) and was piloted with a small group of five teachers and ten students to ensure clarity and contextual relevance. Minor revisions were made to wording based on the pilot feedback.

Quantitative data from closed-ended items were analyzed using descriptive statistics, enabling the identification of patterns in ICT use, access, and teacher preparation. Qualitative responses were analyzed using thematic coding, following Braun and Clarke's (2006) six-phase framework for thematic analysis. This process allowed for the extraction of recurring themes that captured participants' perspectives on the affordances and constraints of ICT in the English classroom. The integration of both forms of analysis ensured a balanced representation of measurable trends and experiential insights.

Ethical approval for the study was obtained from the Research Committee of the Regional University Center of Veraguas, Universidad de Panamá. Participation was voluntary, and informed consent was secured from all participants. Student participants under the age of 18 provided assents in addition to parental or guardian consent. Anonymity and confidentiality were strictly maintained throughout data collection and reporting.

## RESULTS

The survey data provided critical insights into the availability of ICT infrastructure in the participating schools of Veraguas. The results are presented in three main areas such as access to ICT infrastructure, teachers' interest in ICT-related professional development, and students' attitudes toward the integration of ICT in English language teaching and learning.

**Table 1.**

*Access to ICT Tools and Wi-Fi in Schools.*

| Access to ICT Tools        | Teachers | Students |
|----------------------------|----------|----------|
| Reliable Access to Wi-Fi   | 2.50%    | 0.50%    |
| Occasional Access to Wi-Fi | 2.50%    | 2.00%    |
| No Wi-Fi Access            | 95.00%   | 97.50%   |

As presented in Table 1, most of both teachers and students reported severe limitations in accessing reliable internet connectivity. Among teachers, 95.00% indicated that their schools lacked Wi-Fi access altogether, while 2.50% reported occasional connectivity and 2.50% reliable access. Students' responses closely reflected these results: 97.50% reported no Wi-Fi access, 2.00% reported occasional access, and only 0.50% agreed with consistent availability.

These findings underscore the pervasive digital infrastructure gap that constrains the effective integration of ICT into English language teaching in Veraguas. Without reliable internet access, teachers and students are unable to fully utilize online resources, interactive platforms, or digital learning tools that are widely recognized as essential for language acquisition. The lack of connectivity, particularly acute in rural contexts, therefore, represents a structural barrier that limits the pedagogical potential of ICT in English classrooms.

**Table 2.***Teachers' Interest in using ICT Training for English Teaching.*

| Interest in ICT Training | Teachers' Interest |
|--------------------------|--------------------|
| Highly Interested        | 92.50%             |
| Somewhat Interested      | 0.50%              |
| Not Interested           | 2.50%              |

Despite the infrastructural constraints described previously, teachers demonstrated a strong willingness to develop their digital competencies. As shown in Table 2, 92.50% of teachers reported being highly interested in receiving training on how to integrate ICT tools into their English language teaching practices. An additional 5.00% indicated that they were somewhat interested, while only 2.50% expressed no interest in ICT-related professional development.

Qualitative responses from the open-ended survey items revealed that the primary obstacle to professional growth is the limited availability of training opportunities tailored to the specific needs of English teachers in rural schools. As Herrera and González (2020) note, the absence of structured professional development programs restricts teachers' ability to effectively leverage ICT, despite their strong motivation to do so. These findings suggest that providing sustained and context-sensitive training could significantly enhance the integration of ICT in rural English classrooms.

**Table 3.***Students' Attitudes Towards the Use of ICT to Enhance the English Language Learning.*

| Attitude toward the use of ICT to improve the English language learning | Students' Attitudes |
|-------------------------------------------------------------------------|---------------------|
| Strongly agree                                                          | 83.50%              |
| Agree                                                                   | 12.50%              |
| Neutral                                                                 | 1.50%               |
| Disagree                                                                | 2.50%               |
| Strongly disagree                                                       | 0%                  |

Table 3 illustrates students' perspectives on the use of ICT to improve English language learning. A large majority (96.00%) either totally agreed (83.50%) or agreed (12.50%) that ICT could enhance their English skills. Only a small proportion expressed neutrality (1.50%), disagreement (2.50%), or total disagreement (0.00%).

Students highlighted language learning applications, online dictionaries, and audiovisual platforms such as video-based resources as particularly useful tools for developing vocabulary, pronunciation, and listening comprehension. The overwhelmingly positive attitudes indicate that, despite the infrastructural limitations documented in Table 1, there is a strong demand from learners for the incorporation of ICT into classroom practices. This student-driven interest reinforces the need to expand digital access and pedagogical innovation in English instruction across rural schools in Veraguas.

**Table 4.***Perceived Effectiveness of ICTs for English Language Learning.*

| Effectiveness        | Teachers perception |
|----------------------|---------------------|
| Very Effective       | 85.00%              |
| Moderately Effective | 12.50%              |
| Not Effective        | 2.50%               |

Table 4 presents teachers' perceptions of the effectiveness of ICT in English language learning. Most teachers (85.00%) reported that ICT is a very effective tool for improving language skills, while 12.50% considered it moderately effective. A small proportion (2.50%) indicated that ICT was not effective. Teachers emphasized that students with access to multimedia resources and language learning applications showed greater engagement and improvement in English language acquisition compared to those without access.

**Table 5.***Challenges Faced by Teachers in ICT Use.*

| Challenges faced using ICTs         | Teachers' challenge |
|-------------------------------------|---------------------|
| Lack of access to reliable internet | 82.50%              |
| Inadequate training                 | 7.50%               |
| Lack of adequate equipment          | 8.00%               |
| Lack of Time to use ICT in class    | 2.00%               |

Table 5 shows the main challenges faced by teachers in using ICT for English language instruction. The most significant challenge, reported by 82.50% of teachers, was the lack of access to reliable internet. Another 7.50% cited insufficient training in ICT tools, while 8.00% mentioned lack of equipment. A smaller percentage (2.00%) highlighted lack of time as a barrier to incorporating ICT into the curriculum.

## DISCUSSION

The primary objective of this study was to examine the integration of ICT in English language teaching within secondary schools in Veraguas, Panama, with particular attention to the perspectives of both teachers and students. The findings reveal substantial disparities in ICT access, most notably the absence of reliable internet connectivity. As shown in Table 1, 95.00% of teachers and 97.50% of students reported that their schools lack consistent Wi-Fi. This outcome corroborates previous research by Herrera and González (2020), who documented the persistent challenges rural areas face in securing adequate digital infrastructure. Without stable internet access, the use of ICT tools remains sporadic and limited in effectiveness, thereby constraining their potential to enhance language learning.

Despite these infrastructural barriers, the study highlights a strong willingness among teachers to engage in ICT-focused professional development. Table 2 indicates that 92.50% of teachers expressed a high level of interest in receiving ICT training, with an additional 5% reporting moderate interest. This finding aligns with the work of López and Núñez (2019), who emphasize the centrality of teacher training in the successful adoption of digital technologies. Many teachers expressed frustration at the absence of tailored training programs, particularly those adapted to English language pedagogy. Their enthusiasm, however,

suggests that with appropriate support and resources, ICT integration could substantially improve instructional practices in the region.

Students likewise demonstrated positive attitudes toward ICT in English language learning. As illustrated in table 1, 96% agreed or strongly agreed that ICT can strengthen their language skills. This is consistent with the broader literature, which highlights that interactive and multimedia resources promote greater engagement and achievement in language acquisition (Meskill and Anthony, 2015). Even under conditions of limited access, students recognized the value of resources such as language-learning applications, online dictionaries, and video platforms. These findings underscore the importance of investing in digital infrastructure to ensure that students can fully benefit from ICT-enhanced learning environments.

The data also reveals a gap between interest and implementation. While teachers and students are eager to adopt ICT, infrastructural deficiencies and insufficient training remain significant obstacles. As shown in table 2, the most frequently reported challenges included the lack of reliable internet (82.50%) and inadequate training opportunities (7.50%). Addressing these barriers will require coordinated policy responses, including expanded digital infrastructure in rural areas and the development of targeted teacher-training initiatives. This study reinforces the argument that ICT has transformative potential in English language education but emphasizes that this potential can only be realized if adequate resources, training, and support are provided.

From a pedagogical perspective, frameworks such as TPACK (Technological Pedagogical Content Knowledge) and SAMR (Substitution, Augmentation, Modification, Redefinition) provide valuable lenses for interpreting these findings. Teachers' enthusiasm for training reflects a need not only for technical knowledge but also for guidance on how to integrate ICT meaningfully into their pedagogical practices (TPACK). For example, training programs should emphasize how English teachers can align content knowledge like grammar, vocabulary, and communication with technology tools such as apps and platforms in ways that enhance student learning outcomes. Similarly, the SAMR model suggests that rural schools should begin with substitution and augmentation. For example, replacing paper dictionaries with digital ones, using offline apps for practice before progressing toward modification and redefinition as collaborative online projects with international peers. This stepwise approach is particularly relevant for rural contexts where connectivity and resources are limited.

Based on these frameworks, continuous professional development programs are strongly recommended to enhance teachers' digital competencies and pedagogical strategies for ICT integration. Such programs should prioritize practical, hands-on approaches tailored to diverse teaching contexts. For educators facing adoption challenges often linked to differences in age, prior experience, and teaching philosophy, personalized support mechanisms such as mentorship, peer collaboration, and access to digital resource libraries could prove highly beneficial. Workshops designed around the TPACK framework could guide teachers in integrating ICT into lesson planning, while the SAMR model could serve as a roadmap for gradually transforming classroom practices in line with resource availability.

At the policy level, the Panamanian Ministry of Education (MEDUCA) must play a proactive role in advancing ICT integration. This should include the design of a comprehensive national digital education strategy that ensures equitable access, monitors the effectiveness of ICT implementation, and fosters innovation in teaching practices across regions. Strategic partnerships with public and private sector organizations could provide schools with essential resources, including hardware, software licenses, and reliable internet connectivity, alongside ongoing technical support and maintenance. In rural areas, where connectivity is limited, policies should also promote offline-compatible tools and low-bandwidth solutions, ensuring that students and teachers can continue to benefit from ICT even when internet access is inconsistent.

A key limitation of this study was the nationwide teachers' strike in Panama, which coincided with the initial data collection period. The resulting school closures delayed access to participants and disrupted the timeline for surveys, interviews, and classroom observations. Consequently, real-time data on ICT use was constrained. To address this limitation, data collection was extended into March 2024, once schools resumed normal operations. This adjustment allowed for more reliable data capture and ensured that the findings reflect current practices in secondary schools across Veraguas province.

Future research should build on these findings in four directions. First, studies should investigate the relationship between teachers' age and their ability to integrate ICT, with attention to generational differences in digital literacy, tool preferences, and professional development needs. Second, further research should evaluate ICT infrastructure across urban, suburban, and rural schools, focusing on

disparities in connectivity, hardware availability, and technical support. Third, it is necessary to assess the alignment between the national English curriculum and existing ICT tools to ensure that digital resources effectively support curricular objectives. Finally, future studies should explore the role of ICT in language assessment, examining the reliability and accessibility of digital tools for formative and summative evaluation.

By integrating pedagogical frameworks such as TPACK and SAMR, and by adopting actionable recommendations tailored to rural contexts, future studies and policy initiatives can provide a clearer roadmap for enhancing ICT use in English language teaching. Such approaches will be crucial for bridging gaps in teacher preparedness, infrastructure, curricular alignment, and evaluation methods, thereby contributing to more equitable and effective language education in Panama.

## CONCLUSION

The integration of Information and Communication Technologies (ICT) in English language teaching presents both opportunities and challenges, as highlighted by Addam (2014). In the context of secondary schools in Veraguas, Panama, this study emphasizes the urgent need to address infrastructural deficiencies, particularly the lack of reliable internet connectivity, which significantly restricts the effective use of digital tools in classrooms. Survey results demonstrate that while both teachers and students acknowledge the potential of ICT to enhance English language learning, inconsistent access to technological resources remains a critical barrier. Bridging this gap is essential to ensure that the educational benefits of ICT are equitably distributed, especially in rural areas where the digital divide is most pronounced.

Despite these infrastructural constraints, the findings reveal a strong demand for ICT integration in the classroom. Teachers expressed considerable enthusiasm for professional development, with 85% of respondents indicating a high level of interest in ICT-related training. This underscores the necessity of targeted programs that go beyond introducing digital tools, focusing instead on their effective pedagogical application in English language teaching. With adequate training and resources, teachers could create more interactive, engaging, and learner-centered classrooms, thereby fostering improved language acquisition outcomes.

Students also demonstrated strong interest in the use of ICT for self-directed learning. According to the survey, 96% of students believe that ICT can support the development of their English language skills. Digital tools such as language-learning applications, online dictionaries, and multimedia resources were viewed as particularly valuable. However, without improved access to these resources, this enthusiasm risks being underutilized. Schools in Veraguas, particularly those in rural contexts, require both infrastructural investment and institutional support to fully harness students' motivation and interest in technology-enhanced learning.

Finally, this study highlights the critical role of policymakers in advancing ICT adoption. It is imperative that the Ministry of Education and other stakeholders invest in improving the digital infrastructure of schools while simultaneously providing comprehensive ICT training for teachers. Although students and teachers are eager to embrace technology, the absence of adequate resources continues to impede progress. By addressing these issues, Panama can better position its education system to meet the demands of the digital age, ensuring that all students, regardless of geographic location, have equitable access to high-quality English language learning opportunities. The findings reinforce the argument that, when supported by appropriate infrastructure and training, ICT can serve as a transformative tool for language education, even in remote areas.

## BIBLIOGRAPHICAL REFERENCES

- Addam, B. B. K. (2014). *Integrating Information and Communication Technologies (ICT) into teaching and learning: The case of mathematics, science and technology education in one Higher Education institution* (Tesis doctoral). University of Fort Hare.  
<http://hdl.handle.net/20.500.11837/523>
- Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *International Review of Research in Open and Distributed Learning*, 12(3), 80-97.  
<https://doi.org/10.19173/irrodl.v12i3.890>

Autoridad Nacional para la Innovación Gubernamental. (2021). *Agenda Digital Panamá 4.0*.

<https://www.innovacion.gob.pa/>

Bates, A. W. (2020). *Teaching in a Digital Age: Guidelines for Designing Teaching and Learning* (2nd ed.). Tony Bates Associates Ltd.

<https://pressbooks.bccampus.ca/teachinginadigitalagev3m/>

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>

Comas-Quinn, A. (2011). Learning to teach online or learning to become an online teacher: An exploration of teachers' experiences in a blended learning course. *ReCALL*, 23(3), 218–232. <https://doi.org/10.1017/S0958344011000152>

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.

Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology changes: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology in Education*, 42(3), 255–284. <https://doi.org/10.1080/15391523.2010.10782551>

Herrera, M., & González, L. (2020). *ICT infrastructure challenges in rural Panamanian schools: A case study of Veraguas*. *Journal of Rural Education*, 18(2), 55–72.

Kirkwood, A., & Price, L. (2014). Technology-enhanced learning and teaching in higher education: What is 'enhanced' and how do we know? A critical literature review. *Learning, Media and Technology*, 39(1), 6–36. <https://doi.org/10.1080/17439884.2013.770404>

López, A., & Núñez, R. (2019). Teacher training for ICT integration in Panamanian schools. *Educación y Tecnología*, 8(1), 112–125.

Meskill, C., & Anthony, N. (2015). Teaching languages online: The role of ICT in the language classroom. *TESOL Quarterly*, 49(3), 469–481. <https://doi.org/10.1002/tesq.238>

Ministerio de Educación de Panamá. (2020). *Estado de la infraestructura tecnológica educativa en Panamá*. <https://www.meduca.gob.pa>

OECD. (2018). *The Future of Education and Skills: Education 2030*. <https://www.oecd.org/>

Safira, S., Purnamika Utami, I. G. A. L., & Arie Suwastini, N. K. (2024). The immense of digital divide: A literature review of rural and urban schools's classroom technologies in English language learning. *Jurnal Indonesia Sosial Teknologi*, 5(8), 3667–3677.

<https://doi.org/10.59141/jist.v5i8.1306>

Severin, E., & Capota, C. (2011). *One-to-one laptop programs in Latin America and the Caribbean: Panacea or plunder?* Inter-American Development Bank.

<https://publications.iadb.org>

Selwyn, N. (2016). *Education and Technology: Key Issues and Debates*. Bloomsbury Publishing.

UNESCO. (2019). *ICT in education: A tool for inclusion*. UNESCO Digital Report. Retrieved from <https://unesdoc.unesco.org>

UNESCO. (2021). *Reimagining Our Futures Together: A New Social Contract for Education*. <https://unesdoc.unesco.org>

Van Dijk, J. A., & Hacker, K. (2003). The digital divide as a complex and dynamic phenomenon. *The Information Society*, 19(4), 315-326. <https://doi.org/10.1080/01972240309487>