



The Use of Information and Communication Technologies in the Process of Teaching English After the COVID-19 Pandemic



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Abstract

The research was carried out at Eloy Alfaro University, in the Chone extension. The objective was to analyze the use of information and communication technologies in teaching the English language after the Covid-19 pandemic. It was a difficult stage for schools, including universities, because students and teachers were not prepared for the change from face-to-face to virtual classes, so they had to take measures to continue with the planned programs. The English subject also changed; in this sense, it was necessary to adapt to the conditions. The quantitative and qualitative method was used to identify, analyze, and describe information and communication technologies in the English teaching process, in addition to desk research, which is based on searching for the published material in reliable reports and documents. Was obtained as results that the technologies used by teachers and students in the English language teaching process after the Covid-19 pandemic showed that teachers were able to respond positively and incorporate new technologies into the English language teaching process, demonstrating that new methodological schemes have evolved, strengthening and invigorating teaching: in addition to contextualizing the research before and after isolation.

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1 Introduction

Ecuador has not been far from these studies, which have led universities to develop their programs and methodologies based on the relationship between learning, learning to teach, and teaching to learn, due to the transversality and multilateralist of the language process that is necessary for almost all the branches of knowledge (Cruz et al., 2021). Usually, the programs worked; but the COVID-19 pandemic changed the vision of the educational process; since teachers and students were not prepared for change, this process occurred at all academic levels, where they migrated to a virtualized teaching and learning methodology, meaning a real challenge for teaching, students, parents, that has caused advances for the educational sector (Chanet al., 2000; Snyder, 2019).

The presence of COVID-19 had the effect that governments pronounced themselves in favor of adopting and implementing health emergency measures, confinement, and social isolation to prevent the spread of the virus, seeing the need to use new systems, methods, and techniques of teaching, becoming some computer tools as one of the best learning schemes for contingency; also, as a good alternative for later stages (Sánchez, 2020). During the pandemic, Information and Communication Technologies (ICTs) became a tool capable of motivating students and teachers. These have been used at all levels, from the public (Gómez et al., 2019) to private ones in different courses.

The hybrid method was implemented in some universities when there were no resources. This method consisted of elaborating didactic materials that digitalized distance education requires, with Hybrid Learning and Flipped Classrooms. This method helped to process and collect information through theoretical and empirical level methods such as modelling, documentary analysis, observation of learning, experimentation, interview, and group discussion, in addition to the self-reflection technique (Calvet et al., 2022). The flipped classroom has been helpful throughout the pandemic, used at almost all levels and in different subjects. The smartphone is often seen as a distraction; however, in the flipped classroom field, it can become a fun monitoring tool for student learning progress, including language class (Ventosilla et al., 2021).

In Peru, researchers analyzed the impact of the use of ICTs on the comprehension of English language texts in students in the fifth grade of the secondary school of an educational institution; this study showed the usefulness of these technologies at different levels of education. Also, the results showed the importance of ICTs in the comprehension of English language texts (Aguirre et al., 2021).

At present, we return to the classroom, the scenarios are different, the teachers are new experts in the use of technology, and it is necessary to explore the changes in this situation in the use of ICTs in education in the subject of English as an interactive, flexible, entertaining instrument in some cases with the ability to transfer extensive and instantaneous information (Ghasemi & Hashemi, 2011; Tondeur et al., 2008). These technologies help teachers to teach English in face-to-face classes because, in the past or before the pandemic, teachers avoided the use of technology for different reasons such as time, money, minor equipment, lack of training, and other aspects; this caused the classes to be boring and monotonous. This study aims to identify, analyze, and describe How the COVID-19 pandemic influenced English teachers at Ecuadorian universities to use information and communication technology resources in-class activities (Cochran-Smith, 2005; Tschannen-Moran & Hoy, 2007).

2 Materials and Methods

A bibliographic review was carried out, where journals and books indexed in reliable databases were investigated to know the state of using ICTs in the teaching process before and after the COVID-19 pandemic. This research study followed the quantitative and qualitative methods; data collection and analysis require fieldwork, quantitative application: descriptive statistics, qualitative application: interpretation, and deep reflection (Cubias, 2016). Data were collected through an interview with teachers and a questionnaire for the students. Data triangulation was applied to confirm and validate the quality of the results.

Sample

A non-probabilistic (for convenience) sampling was carried out. This study had a sample of 3 teachers and 76 students from the Area of Foreign Language Pedagogy at ULEAM University. The sample for teachers was originally 4 participants, but one withdrew from the Project due to time problems. The students who agreed to participate were included.

Instruments and procedures

For this, the data was collected using two instruments to know the use of ICT resources: an interview with teachers and a questionnaire for students (Avalos, 2011). The instruments consist of 7 questions. During the phase of the study, the teacher participants were interviewed by Zoom application to identify which technologies and resources they utilized in their teaching English classes after the COVID-19 pandemic. In this phase, the participants were asked to respond to open-ended questions about the ICTs used in their classes. By definition, open-ended questions are broad and can be answered in detail. The interview was recorded (Mercer & Howe, 2012; Bolhuis, 2003).

The design of the questionnaire was reviewed by two experts. In addition, the reliability of the questionnaire was assessed via a pilot test. Following consideration of the feedback from the pilot test group and some minimal changes based on their suggestion, the questionnaire was distributed online to the study sample using the Google Form platform. Quantitative data from the questionnaire were analyzed using SPSS for descriptive statistical analysis. In addition, qualitative data derived from the interview were analyzed using interpretation and deep reflection.

3 Results and Discussions

The Eloy Alfaro University in the Chone extension was not exempt from the difficulties that occurred in virtuality in the isolation stage caused by the COVID-19 pandemic, where the professors did not have an adequate methodology to assume the challenge and the students also had difficulties in taking the teaching process satisfactorily from their homes. Hence, the objective of the research was to analyze the use of information and communication technologies in the English language teaching process after the COVID-19 pandemic. This inquiry is outside this study's vital areas, as seen in Figure 1.

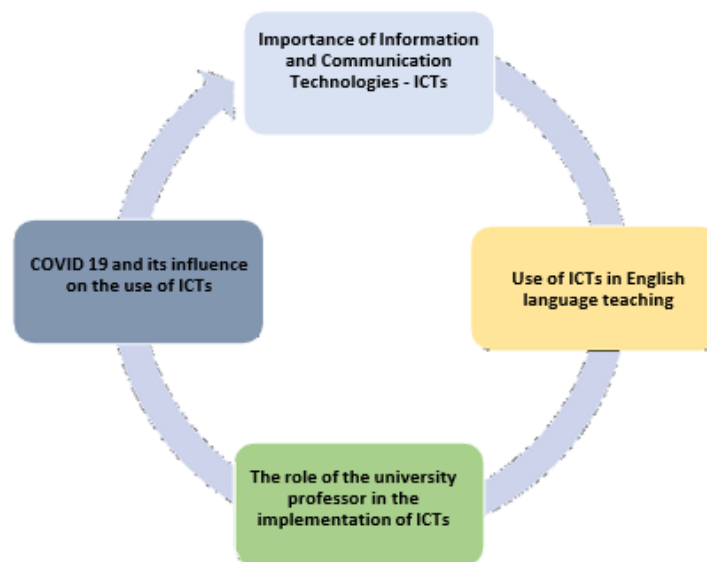


Figure 1. Areas of this study

Use of ICTs in English language teaching

ICTs are used in almost the entire education sector as an instrument for teachers to deepen learning and for students as a viable way of learning by understanding. In studies carried out in an international business career at a Mexican public university, the results were that students perceive the use of technologies as support in positively learning English and are aware of how these tools can help them acquire skills to master a second language; however, they recognize that they have not yet managed to internalize the use of ICTs, mainly those aimed at the educational process (Carranza et al., 2018).

A study can be incorporated into its use in primary schools; a practical example is in Mexico, where they have had a result that the technologies that teachers use are not very varied; the most used is the laptop and the USB memory and, in the case of applications, word processor and spreadsheet; In addition, they also noted that teachers use ICTs mainly for administrative tasks such as recording student performance and attendance and that the most vital inhibiting factor, of an institutional nature, is lack of training (Gómez et al., 2019).

The role of the university professor in the implementation of ICT

This study considers professors and students to triangulate the information collected; the participants teach and study in the Area of foreign language Pedagogy. In the spotlight where they can share their teaching experiences, the use of technology in their classes, and the integration of ICTs with their students (Delgado et al., 2019).

The bibliography shows two trends regarding the attitude of university teachers about the educational use of ICTs; these are based on the form of each of the teachers and the relationship with other associated personal and institutional variables since they are linked elements of being teachers (Sang et al., 2010).

Are teachers sane to using ICTs in the educational process? They have a favourable attitude and apply their knowledge in the classroom. There are the neutrals, even when they positively value the use of ICTs in their classrooms and have training in the use of these tools, they still do not transfer their application to their daily pedagogical practice; and others who are not willing to use information technologies do not criticize them, but they do not implement them either, so they are with one or the other (Ruiz, 2012).

Technological advances go hand in hand with educational development in classrooms at any academic level progress is made along with scientific development in such a way that must train some teachers to be able to be in the environment of these advances; all of this, together with their students to improve the educational process. According to (Viñals & Jaime, 2016), they state that knowledge is online, and teachers should be the ones who accompany students in their learning process.

Definition of ICTs

Information and Communication Technologies are fundamental tools to support the activities of research professionals in different processes; their acceptance and use are linked to efficiency and competitiveness in many areas of knowledge, management, and productivity; they have become multifunctional tools and are internationalized (Monteagudo, 2022).

When ICTs or Information and Communication Technologies are mentioned, it refers to a diverse group of practices, knowledge, and tools linked to the consumption and transmission of information and developed from the vertiginous technological change that humanity has experienced in the decades, mainly because of the appearance of the Internet (Etecé, 2022).

Other authors suggest that it is the combination of information and communication, meaning Information and Communications Technology; these refer to the technologies that allow access to information through the media, such as computers, mobile phones, tablets, and other electronic equipment; ICT represents an important development for the teaching of English as a foreign language, therefore, today, and teachers have many more alternatives. In modern schools, digital technologies or ICT go hand in hand with academic programs; teaching methods may differ from what teachers have experienced before in schools (Mahdi & Al-Dera, 2013).

Importance of ICTs

The applications that integrate ICTs in the classroom can benefit those who teach since they provide additional support for the development of classes. They significantly improve their quality and can be an excellent ally for education. Uleam Teachers mentioned the importance of using ICTs and how technologies improve their English classes. As Gonzalez (2015), mentioned: The use of ICTs can be an excellent ally for education today. They also offer many interactive options for the development of classes at all academic levels; that is, if, for some reason, a specific technological resource cannot be used, these can be quickly replaced without affecting the development of the class. The time of isolation accelerated the use of ICTs. To verify this statement, students and teachers answered if they considered that these resources were introduced in teaching English at that stage; Figure 2 shows the obtained results.

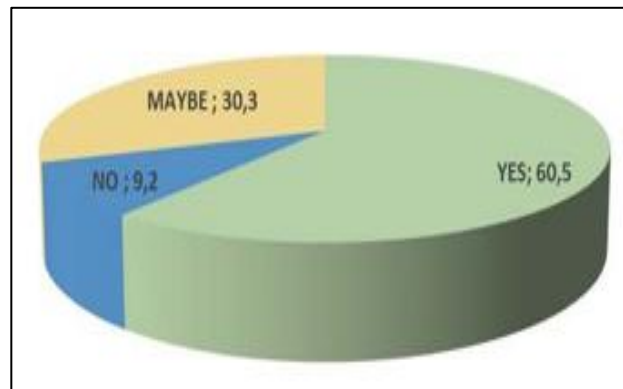


Figure 2. Use of ICTs in the English language in the time of isolation caused by the COVID-19 pandemic

As seen in the figure, most respondents answered positively, demonstrating that this insertion of technologies in the English language process has been valid and corroborating criteria addressed in the interview by the teachers stating that various electronic devices are used from that stage, such as computers, telephones, platforms, the internet, etc., to improve the dynamics of language learning (Azmi, 2017), it was also raised by (Calvet et al., 2022); these authors present the necessity of technologies in the second outbreak of the coronavirus, where materials developed for teaching English in the third year of the degree were applied through the moodle platform, WhatsApp, computers and cell phones. Favorable opinions have been obtained from students and teachers in terms of quality of learning, motivation, accessibility, creativity, and cultural and pedagogical values.

It is considered that teaching with the use of technology significantly favors learning, allows more interaction between teacher and student, and students to acquire knowledge much more favorably. Currently, there is this facility in terms of the use of online technology. It is very suitable for learning English because it motivates students to learn due to varied, dynamic, and creative methods (Çakici, 2016).

With technology, students have more opportunities for cultural and language exchanges, which is essential to foster the acquisition of a new language and is increasingly important in daily life and the educational system (Lawrence & Tar, 2018). Every day people use technology. Educational institutions update their educational processes for the application when planning their classes.

Use of ICTs in the teaching of the English language

With the teaching of English, new avant-garde models for language teaching have been introduced worldwide; among these, we place the use of ICTs as innovative and practical tools which emerged to support the teaching and learning process in general. Using these feels like an alternative and entertaining method for teachers and students (Salama, 2019).

As mentioned by Uleam teachers, technological resources have become indispensable in language classes, promoting autonomous and collaborative learning in face-to-face and online classes; digital activities can improve students' language skills. Technology cannot replace a teacher; however, it contributes to making learning a meaningful experience. Figure 3 shows the survey results applied to students related to the ICT resources that are useful and efficient in teaching the English process after the pandemic.

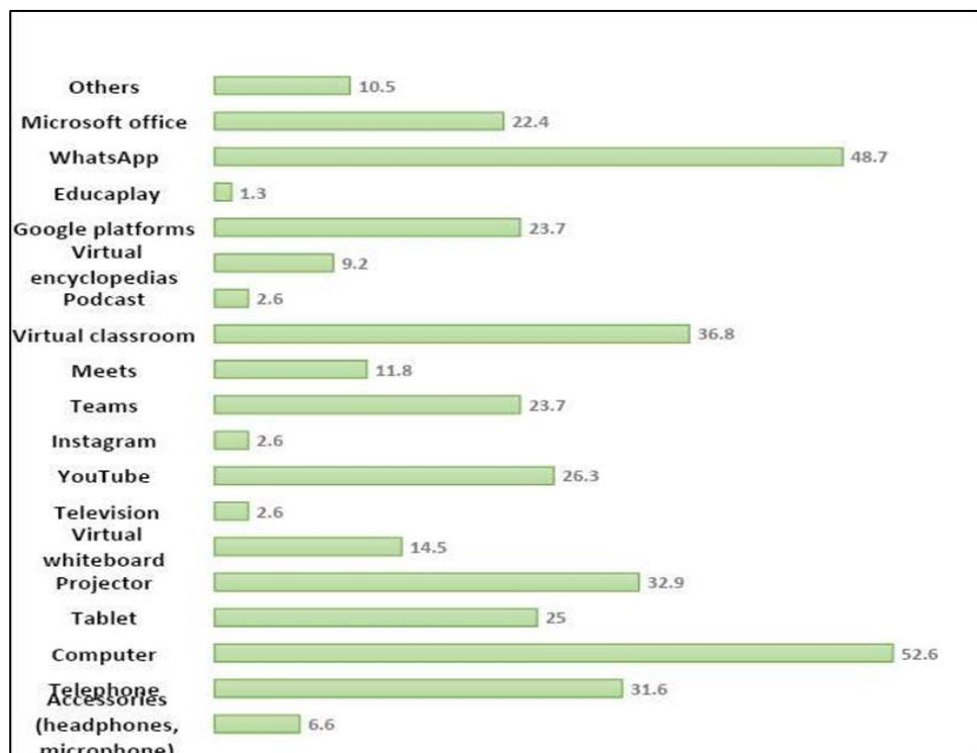


Figure 3. ICTs resources that are useful and efficient in teaching English after the pandemic

As seen in Figure 3, students choose different options, demonstrating that technological resources are used successfully in the English teaching process. Corroborating opinions by the teachers in the interview stated that varied technological resources are used in English classes because they facilitate the planning of English classes; for example, teachers must use technical resources according to the skills they want to develop in their students. In addition, the use of ICTs represents an excellent help for the teacher since it is much easier for them to prepare, store and apply the material that they are going to use in class (Jayanthi & Kumar, 2016).

Implementing ICTs for effective language teaching must consider the elements behind the teacher's decision regarding its use; teachers are also apprentices since they need to acquire new skills to apply ICTs in the teaching process. Teachers must be up to date concerning their professional skills and knowledge, adapt them to their pedagogical practices, and design and develop their lesson plans for language learning to be successful. The use of ICTs in foreign language teaching generates extraordinary opportunities for students to develop foreign language skills, using real-time interaction applications to allow the student the chance to listen to fluent or native speakers and, thus, acquire essential skills that will enable them to develop their skills in the target language (Ho, 2006; Campbell et al., 2004; Fageeh, 2011).

From another perspective, other authors have stated that even though talking about technologies is quite common in academic environments, the teacher's lack of knowledge or inadequate training often limits taking full advantage of these tools; or, failing that, these resources are not even used. These difficulties delay the successful application of ICTs, limiting the use of beneficial strategies in teaching the English language (Torres & Campoverde, 2021).

The role of the university professor in the implementation of ICTs

The acceptance of the use of technology in classes by teachers seems to be controversial. While a group of teachers has quickly adapted to using ICTs in their classes, some are wary but open to learning slowly, while others are aloof and reject them. The position of the teacher regarding the use of ICTs must migrate to modernity in the classroom (Salama, 2019). Technology is an integral part of every activity we carry out daily and allows us to interact with the rest of the world constantly.

Teachers in an educational context have a role that is necessary for the integration of ICTs; they are the ones who decide what strategies and resources to use for successful teaching; it is a responsibility that teachers must assume

with preparation. Teachers are key in the context of learning and teaching in the classroom, therefore, the impact that ICTs have on it. The teacher is a crucial actor who directs the process, and ICTs do not replace the teacher; only, they represent an ideal resource for the development of classes (Paudel, 2021).

With the support of ICTs, teachers have an infinite diversity for the selection of resources and materials; they are responsible for proposing the methodologies and instruments to be used to find and build information that benefits and contributes in a significant way to the learning process of students through reliable methods to put ICTs into practice in their classes (Lalangui & Valarezo, 2016).

In the teaching process, teachers use ICTs to enhance their academic work and develop strategies to involve their students in meaningful activities that promote satisfactory results. The process is limited when the teacher is not familiar with the use of ICTs resources; the teacher is limited to developing his traditional classes; therefore, the teacher must be competent in using technologies; if teachers fail to enhance these tools, they will not achieve benefits for the teaching process (Herrera et al., 2021).

University teachers must prepare themselves by incorporating an innovative process in the methodologies they use in the classroom. They are precursors of the positive effects of using ICTs. They must be aware of the favorable impact of technology on the teaching and learning process and not limit knowledge but offer new and varied resources to acquire more knowledge (Ocaña et al., 2020). ICTs are essential in a culture of lifelong learning that requires highly trained professionals in this field for their correct execution.

University centers need to get involved in quality improvement processes, and this, in our field, translates into teaching innovation processes supported by ICTs (Salinas, 2019); they must analyze the current situation and consider making innovative changes if necessary, focusing on updating, training teachers, and offering what society needs at this time, technology. In this sense, teachers cannot avoid reality and the current time, considering that technology and digital competence are key in humans (Prendes et al., 2018).

COVID-19 and its influence on the use of ICTs

Higher education is changing; learning is no longer only considered as a narration of facts, nor is the knowledge given exclusively in the physical classroom. Two years ago, due to the COVID-19 pandemic, education migrated to virtuality, knowledge was transported through digital platforms, and learning took place in various ways. ICTs favored teaching and learning from home (Sandoval, 2020); society is already immersed in a technological world where ICTs played a fundamental role in facilitating the teaching and learning process during the pandemic and will continue to do so in times to come.

The pandemic revolutionized education: now, teachers can analyze how the teaching process is conceived and improve educational practice with the return to face-to-face learning (Pomares et al., 2022). Teachers must continue to innovate using digital tools in the classroom, as was done previously in online classes; in the end, something positive must have remained after the transition process and changes experienced during this period.

During the pandemic, the use of ICTs was a viable solution, not only for education but also for all professional and non-professional sectors around the world, interruptions were minimized, and the delivery of academic programs continued through digital platforms (Crawford et al., 2020), for this reason, today more than ever, the application of ICTs are highly effective in education, they ensure universal academic continuity.

4 Conclusion

An analysis of the technologies used by teachers and students in the process of teaching the English language after the COVID-19 pandemic was carried out, and the results showed that technological resources are used in English classes because they facilitate their planning of them. In addition, the use of ICTs for teachers represents an excellent help since it is much easier for them to prepare, store and apply the material that they are going to use in class (Jayanthi & Kumar, 2016), demonstrating that new methodological schemes have evolved (podcast, image, discussion group, google platforms) strengthening and streamlining the teaching of the language. Also, a bibliographic review was carried out before and after the pandemic, achieving a critical analysis of the behavior of the teaching process and the levels of preparation teachers faced in the isolation process.

The results of this study and the increasing levels of ICT use by teachers, as pointed out by Paudel (2021), suggest a need to guarantee the integration of ICTs in the educational context. Teachers are key in the context of learning and teaching in the classroom, therefore, the impact that ICTs have on it. Therefore, this research

contributes to improving the curriculum, environment in the classroom, and educational policy, providing vital information that will help to develop new educational systems, combining the teaching and ICTs use in all levels of education. Recommendation for Practitioners

Future studies may consider taking the findings of this study to create a teacher training course that responds to technological needs in the English teaching process. In this way, Government sectors and university authorities need to consider how to support teachers after the COVID-19 pandemic to help them successfully achieve the set learning goals and objectives. If the teachers are prepared for ICTs use, this may mitigate the effects of the pandemic and benefit the acquisition of knowledge.

Conflict of interest statement

The authors declared that they have no competing interests.

Statement of authorship

The authors have a responsibility for the conception and design of the study. The authors have approved the final article.

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References

- Aguirre, Y. M., Vargas, R., Huaman, A. M., & Gutierrez, G. S. (2021). Uso de las TIC en la comprensión de textos del idioma Inglés en estudiantes de secundaria. *Horizontes Revista de Investigación en Ciencias de la Educación*, 5(21), 72-82.
- Avalos, B. (2011). Teacher professional development in teaching and teacher education over ten years. *Teaching and teacher education*, 27(1), 10-20. <https://doi.org/10.1016/j.tate.2010.08.007>
- Azmi, N. (2017). The Benefits of Using ICT in the EFL Classroom: From Perceived Utility to Potential Challenges. *Journal of Educational and Social Research*, 7(1), 111–118.
- Bolhuis, S. (2003). Towards process-oriented teaching for self-directed lifelong learning: a multidimensional perspective. *Learning and instruction*, 13(3), 327-347. [https://doi.org/10.1016/S0959-4752\(02\)00008-7](https://doi.org/10.1016/S0959-4752(02)00008-7)
- Çakici, D. (2016). The Correlation among EFL Learners' Test Anxiety, Foreign Language Anxiety, and Language Achievement. *English language teaching*, 9(8).
- Calvet, N., Hernández, J., & Acosta, R. (2022). Aprendizaje Híbrido del inglés en la Universidad en tiempos de pandemia. Mendive. *Revista de Educación*, 20(1), 285-301.
- Campbell, W. M., Singer, E., Torres, P. A., & Reynolds, D. A. (2004). Language Recognition with Support Vector Machines. ODYSSEY, pp. 285–288.
- Carranza, M. d., Islas, C., & Maciel, M. L. (2018). Perception of students regarding the use of ICT and learning English. *Apertura*, 10(2), 50-63.
- Chan, F. T. S., Chan, M. H., & Tang, N. K. H. (2000). Evaluation methodologies for technology selection. *Journal of Materials Processing Technology*, 107(1-3), 330-337. [https://doi.org/10.1016/S0924-0136\(00\)00679-8](https://doi.org/10.1016/S0924-0136(00)00679-8)
- Cochran-Smith, M. (2005). Teacher educators as researchers: Multiple perspectives. *Teaching and teacher education*, 21(2), 219-225. <https://doi.org/10.1016/j.tate.2004.12.003>
- Crawford, J., Butler-Henderson, K., Rudolph, J., Malkawi, B., Glowatz, M., Burton, R., ... & Lam, S. (2020). COVID-19: 20 countries' higher education intra-period digital pedagogy responses. *Journal of Applied Learning & Teaching*, 3(1), 1-20.
- Cruz, L., Matos, E. C., & Marriott, H. M. (2021). La metaenseñanza-aprendizaje del idioma inglés con fines didácticos. Dilemas contemporáneos: educación, política y valores, 8(3).
- Cubías, F. A. (2016). Portafolio Académico. Diseño, Tecnología e Innovación. <https://portaprodti.wordpress.com/>
- Delgado, D. G. L., Delgado, F. E. A., & Quiroz, P. M. Z. (2019). Permanent application of diagnostic assessment on learning teaching process. *International Journal of Linguistics, Literature and Culture*, 5(4), 34–45. <https://doi.org/10.21744/ijllc.v5n4.699>
- Etecé, E. (2022). TICs. Obtenido de <https://concepto.de/tics/>.
- Fageeh, A. (2011). EFL learners' use of blogging for developing writing skills and enhancing attitudes towards English learning: An exploratory study. *Journal of Language and Literature*, 2(1), 31–48.
- Ghasemi, B., & Hashemi, M. (2011). ICT: Newwave in English language learning/teaching. *Procedia-social and behavioral sciences*, 15, 3098-3102. <https://doi.org/10.1016/j.sbspro.2011.04.252>
- Gómez, C. E., Ramírez, J. L., & Chuc, I. (2019). The use of ICT in English Teaching in Public Primary Schools. *Revista de estudios y experiencias en educación*, 18(36), 75-94.
- Gonzalez, H. (2015). La integración de la tecnología como herramienta significativa en la enseñanza del inglés como lengua extranjera. *Horizontes Pedagógicos*, 17(1). 53-66. ISSN: 0123-8264n
- Herrera, M. Á., Espinoza-Weaver, Y., Rivera, G. M., Espinosa, J. D., & Orellana, V. (2021). Pedagogical pathways towards 2030: The proposal of a model for the Ecuadorian education system. *Revista Andina de Educación*, 4(1), 1-4.
- Ho, w. k. (2006). English Language Teaching in East Asia Today: An Overview. *Asia Pacific Journal of Education*, 22(2), 1–22.
- Jayanthi, N. S., & Kumar, R. V. (2016). Using Technology in ESL Classroom: Highlights and Challenges. *Creative Education*, 10(12).
- Lalangui, J. H., & Valarezo, J. W. (2016). Learning, knowledge era and ICT at the University Ecuadorian reality. *Ateneas*, 2(38).
- Lawrence, J. E., & Tar, U. A. (2018). Factors that influence teachers' adoption and integration of ICT in the teaching/learning process. *Medios educativos internacionales*, 55(4), 1-27.
- Mahdi, H. S., & Al-Dera, A. S. (2013). The Impact of Teachers' Age, Gender, and Experience on the Use of Information and Communication Technology in EFL Teaching. *English Language Teaching*, 6(6).

- Mercer, N., & Howe, C. (2012). Explaining the dialogic processes of teaching and learning: The value and potential of sociocultural theory. *Learning, culture and social interaction*, 1(1), 12-21. <https://doi.org/10.1016/j.lcsi.2012.03.001>
- Ocaña, Y., Valenzuela, L., & Morillo, J. (2020). The Digital Competence in the University Teacher. *Propósitos y Representaciones*, 8(1).
- Paudel, P. (2021). Online Education: Benefits, Challenges, and Strategies During and After COVID-19 in Higher Education. *International Journal on Studies in Education (IJonSE)*, 3(2), 70–85.
- Pomares, E. d., Iglesias, B. Z., & Arencibia, L. G. (2022). Virtual classrooms: innovative teaching culture and new educational normality due to COVID-19. EDUMECENTRO, 14.
- Prendes, M. P., Gutiérrez, I., & Martínez, F. (2018). Competencia digital: una necesidad del profesorado universitario en el siglo XXI. *Revista de Educación a Distancia (RED)*, 18(56).
- Ruiz, C. (2012). La actitud del docente universitario hacia el uso educativo de las tic: conceptualización y medición. *Paradigma*, 33(2), 007-026.
- Salama, O. (2019). Investigating the Challenges of Integrating Information and Communication Technology in Teaching English Language. *Journal of Linguistics and Literature*, 3(1), 11–18.
- Salinas, J. (2019). Innovación docente y uso de las TIC en la enseñanza universitaria. RUSC. *Revista Universidades y Sociedad del Conocimiento*, 1(1).
- Sánchez, M. (2020). Aula invertida, el esquema ideal para la educación durante el confinamiento.
- Sandoval, C. (2020). La Educación en Tiempo del COVID-19 Herramientas TIC: El Nuevo Rol Docente en el Fortalecimiento del Proceso Enseñanza Aprendizaje de las Prácticas Educativa Innovadoras. *Revista Tecnológica-Educativa Docentes*, 9(2), 24–31.
- Sang, G., Valcke, M., Van Braak, J., & Tondeur, J. (2010). Student teachers' thinking processes and ICT integration: Predictors of prospective teaching behaviors with educational technology. *Computers & Education*, 54(1), 103-112. <https://doi.org/10.1016/j.compedu.2009.07.010>
- Snyder, H. (2019). Literature review as a research methodology: An overview and guidelines. *Journal of business research*, 104, 333-339. <https://doi.org/10.1016/j.jbusres.2019.07.039>
- Tondeur, J., Van Keer, H., Van Braak, J., & Valcke, M. (2008). ICT integration in the classroom: Challenging the potential of a school policy. *Computers & education*, 51(1), 212-223. <https://doi.org/10.1016/j.compedu.2007.05.003>
- Torres, J. J., & Campoverde, M. (2021). Bibliometric analysis of Green IT in Ecuador. *Polo del conocimiento*, 6(7), 914-934.
- Tschannen-Moran, M., & Hoy, A. W. (2007). The differential antecedents of self-efficacy beliefs of novice and experienced teachers. *Teaching and teacher Education*, 23(6), 944-956. <https://doi.org/10.1016/j.tate.2006.05.003>
- Ventosilla, D. N., Santa María, H. R., Ostos, F., & Flores, A. M. (2021). Aula invertida como herramienta para el logro de aprendizaje autónomo en estudiantes universitarios. *Propósitos y Representaciones*, 9(1).
- Viñals, A., & Jaime, C. (2016). El rol del docente en la era digital. 86(30.2), 103-114.