

ICT CAT and TEP as Tools in English Language Teaching in Universities: A Systematic Review

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Abstract

Technological evolution has introduced innovative tools in education, seeking to optimize and enrich teaching and learning. The terms ICT, CAT and PET describe the various technologies and resources currently used in education. These advances seek to make education more effective and attractive. Objective: To analyze the use of ICT, CAT and PET as tools in English language teaching in universities. Materials and methods: A qualitative methodology were used because the literature on the topic under study was evaluated, which was taken from high impact scientific journals available in databases such as Scielo, Dialnet and Redalyc, based on criteria that defined their exclusion and inclusion. In effect, the PRISMA method was used and, at the same time, it was verified that each article reviewed was closely related to the use of ICT, CAT and PET as tools in English language teaching in universities. Results: A total of 35 articles were obtained, from this group only 15 were selected for the development of the present research after setting aside those studies that were duplicated, did not address the topic of ICT, CAT and PET as tools in English language teaching in universities, and were not retrievable. From the chosen archives it was recognized that ICTs, CAT and PET are essential in modern English language education as they foster innovation and creativity in learning, promote the active participation of university students and facilitate a more personalized education. Conclusions: ICT, CAT and PET represent fundamental tools to raise the educational quality of English language and equip university students with skills to face future challenges.

Keywords: ICT, CAT, PET, teaching, English, university students.

1. Introduction

Currently, Cortés indicates that technology in education is introducing innovative paradigms, challenging both educational institutions and the traditional concept of education, which has often been reluctant to change. (2018)

Consequently, in the current century, technology plays a crucial role that demands teachers to keep up to date, since students often have more advanced knowledge in its use.

In this sense, Cabero indicates that education has undergone a significant recent transformation, largely due to the deep integration of Information and Communication Technologies (ICT) in

both traditional and digital classrooms. Hence, for Ramón and Smulders, the evolution of education through technology implies a continuous need for training to effectively use the available technologies, adapting them to the context of each particular situation. (2019) (2022)

It should be understood that the term CAT is relatively new in education and not so widely used, often due to lack of knowledge, which underlines the importance of training teachers in this technological area for an effective use of resources.

On the other hand, TEPs emphasize collaboration and active participation in the creation of knowledge, where education in the twenty-first century must focus on promoting autonomous and connected learning, using the web to integrate into a constant collective intelligence (Zeballos & Pollier, 2019).

Today's students grow up immersed in an advanced technological environment, arriving at academia with a solid foundation in the use of these tools. This imposes on teachers the challenge of being at the level of their technological knowledge and applying it efficiently in teaching. However, Granados et al. highlight how the integration of ICT in university education has led teachers to develop new teaching methodologies. (2020)

At this point, it is important to point out that, although the incorporation of technologies in education has several years of history, its effective application in the classroom still has shortcomings, which is an important aspect that requires attention and study.

For this reason, Zambrano and Balladares indicate that, today, it is not enough to just use the Internet in university classrooms; the developments of the social Internet or Web 2.0 open up a range of possibilities that go beyond what was initially achieved with the introduction of the Internet, further enriching face-to-face classes. (2018)

As Latorre et al. point out, technology currently has a significant impact on young people, which makes it essential that education positively incorporates it into all disciplines, including language learning and strengthening. It is crucial to take advantage of new technological tools for comprehensive and innovative training. This encapsulates the concept of "university 2.0", which is based on adapting and efficiently implementing these technologies in education. (2018)

For Recuero, pedagogy and inclusion should be seen as interrelated concepts, providing teachers with the opportunity to use more effective educational strategies to connect with their students and train them with a social vision, since ICT plays a crucial role. (2018)

With this it can be deduced that the student's immersion in the virtual world offers a wide range of opportunities and possibilities because it leads them to an open mental space focused on deeper and broader learning in any field of their integral education.

OBJECTIVE

To analyse the use of ICT, CAT and PET as tools in the teaching of the English language in universities.

LINE OF RESEARCH

Research aimed at the use of ICT, CAT and PET as tools in the teaching of the English language in universities.

2. METHODOLOGY

Types of research

- Depending on the approach

This article is developed with the qualitative approach of the research because it favors the coupling of valuable and current information, which cooperates in the analysis of each data through the review of reference sources that have content related to the use of ICT, TACs and TEP as tools in the teaching of the English language in universities.

- According to the purpose

This research is developed in applied research because it weighs and provides theoretical knowledge about the use of ICT, TACs and TEP as tools in the teaching of the English language in universities, through the collection of information related to this phenomenon, with the purpose of forging more knowledge in an orderly manner and based on its value in the field of language teaching.

- According to the scope

This article has a descriptive scope because it presents the way in which ICT, TAC and TEP are implemented as tools in the teaching of the English language in universities by teachers committed to this academic work.

- Population and sample

For the execution of this article, scientific research that has been published in a period of no more than 5 years old is chosen based on several criteria that allow the selection of files that have been published in high-impact digital journals in various specialized search engines or databases such as Scielo, Dialnet and Redalyc that have scientific significance and are truthful.

Likewise, we work with the insertion of key terms during the search, these terms are: ICT, TAC, PET, teaching, English language, and universities. In this way, results were obtained that were closer to the subject under study.

Inclusion criteria

The following parameters are considered:

- Scientific research that has been published in the last 5 years in high-impact journals on the use of ICT, CAT and PET as tools in the teaching of the English language in universities.
- Research carried out in English and Spanish.

- Research available in databases such as Scielo, Dialnet and Redalyc.
- Research that has the key terms.

Exclusion Criteria

The following parameters are considered:

- Scientific data that come from unreliable sources and lack of information that contributes to the development of this study.
- Scientific research whose publication date is more than 5 years old.
- Undergraduate and postgraduate studies.
- Methods to be used

For the development of this research, the method of qualitative data analysis of each scientific research is addressed, which supplements with each of the inclusion criteria previously raised in this article in order to obtain bibliographies that help to clarify the phenomenon regarding the use of ICT, CT and PET as tools in the teaching of the English language in universities.

In a complementary way, the PRISMA method is used, which assists in the definition of the sample under study. The process of this mechanism is described in the following table:

Table 1. Summary of the PRISMA method

Section	Item
Selection parameters	Inclusion and exclusion criteria
Data sources	Scielo, Dialnet and Redalyc
Search system	((TIC, TAC, TEP) AND (english language teaching) OR (language training) OR (foreign language teaching)) Filtres: Randomized Controlled Trial, from 2018 – 2023. (TIC, TAC, PET) (English Language Teaching)
Election procedure	All duplicate articles and those that are not related to the subject of study are excluded. Then we proceed with the review of the topic and summary of each file. Finally, information is collected from those that are chosen through a global review of their content, that is, from start to finish.
Information Collection Procedure	Scimago was used to obtain data from a range of journals with scientific validity.
Keywords	ICT, TAC, TEP, teaching, English language, and universities.
Information list	ICT, CAT and PET as tools in English language teaching in universities: a systematic review.
Mechanism of synthesis	Each of the results of this systematic review is described through the use of tables for an adequate understanding of them by the reading community.

Prepared by: the author.

3. RESULTS

After the execution of an advanced search in Scielo, Dialnet and Redalyc, 35 articles are obtained through various investigation mechanisms, as explained in the following table:

Table 2. Results according to the search system

Database	Search system	Find
Scielo	((TIC, TAC, TEP) AND (English language teaching) OR (language training) OR (foreign language teaching)).	13
Dialnet	((TIC, TAC, TEP) AND (English language teaching) OR (foreign language teaching)).	10
Redalyc	((TIC, TAC, TEP) AND (English language teaching) OR (language training)).	12
Total		35

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Of the total results, 15 studies were selected since they responded to the previously established inclusion criteria and the parameters formulated in the PRISMA method, as detailed in the following figure:

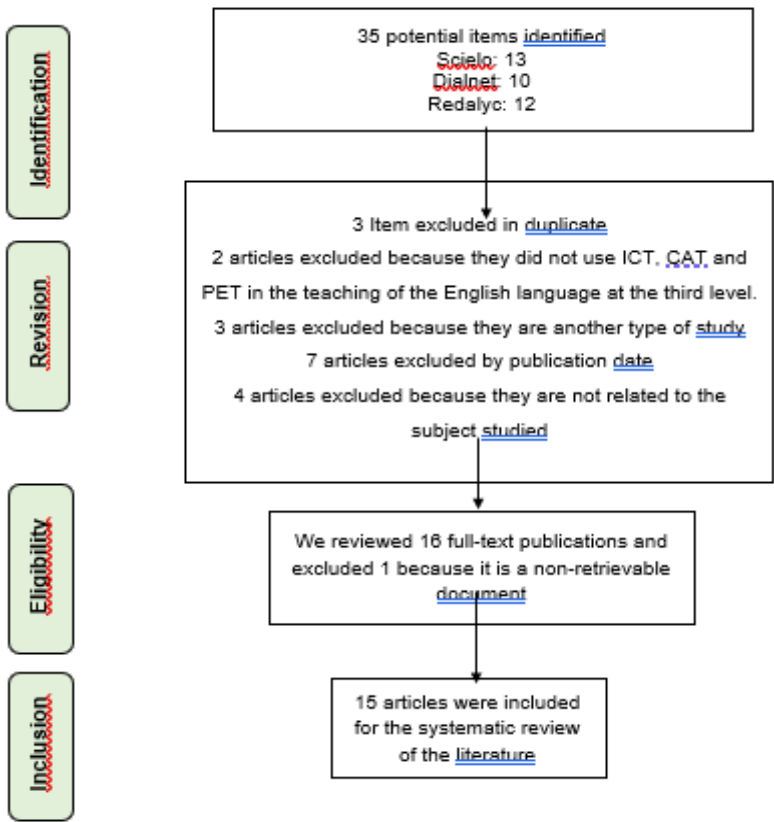


Figure 1. PRISMA mechanism for the selection of investigations

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The 15 articles included in this systematic review article correspond to research that was published in countries such as Mexico, Ecuador, Spain, Colombia, Paraguay, Venezuela, Brazil and Chile. which were available in databases already described; Scielo, Dialnet and Redalyc. The information on each scientific research is presented in the following table:

Table 3. Traceability of selected research

N	Author	Year	Magazine	Country	Seeker	DOI or URL
1	Nájera, A; Pérez, M.	2020	Journal of the Regional Center for Teacher Training and Educational Research (CRESUR)	Mexico	Scielo	https://bitly.ws/37Zxj
2	Fernández, C; Hernández, N.	2018	Círculo Journal of Linguistics Applied to Communication	Spain	Dialnet	https://bitly.ws/37ZxD
3	Ruiz, U; Ampudia, M; Salgado, C.	2023	Ciencia Latina Multidisciplinary Scientific Journal	Mexico	Scielo	https://bitly.ws/37Zyo
4	Espinosa, J; Villamar, J; Quijije, K; Mesa, J.	2023	Knowledge Pole	Ecuador	Redalyc	https://bitly.ws/37ZyH
5	Navarrete, E.	2018	FEDX. Journal of the National Autonomous University of Mexico	Mexico	Scielo	https://bitly.ws/37ZBh
6	González, M.	2018	FECIES Magazine	Spain	Scielo	https://bitly.ws/37ZNv
7	Araque, D; Rodríguez, S.	2021	Virtu@lmente Magazine	Colombia	Dialnet	https://bitly.ws/37ZWU
8	Díaz, M; Camargo, R.	2022	CBTecL Magazine	Brazil	Dialnet	https://bitly.ws/3826w
9	Ramón, D; Smulders, M	2020	Journal on Studies and Research of Academic Knowledge	Paraguay	Dialnet	https://bitly.ws/382du
10	González, M; Ojeda, M; Pinos, P.	2020	Scientific Magazine	Ecuador	Redalyc	https://bitly.ws/382mS
11	Otero, O; Esteves, Z; Suárez, D; Montalván, M.	2023	CIENCIAMATRIA. Interdisciplinary Journal of Humanities, Education, Science and Technology	Venezuela	Redalyc	https://bitly.ws/382u5
12	Palacios, F; Espejo, R.	2019	EDMETIC, Journal of Media Education and ICT	Spain	Redalyc	https://bitly.ws/382Cv
13	González, P; Ochoa, C; Cabrera, P; Quiñonez, A; Castillo, L.	2020	Revista Tendencias en la Investigación Universitaria. A view from Latin America.	Ecuador	Dialnet	https://bitly.ws/383Gq
14	Casimiro, L; Torres, H.	2023	Caribbean Journal of Educational Research RECIE	Chile	Scielo	https://bitly.ws/383TC
15	Sánchez, M; García, J; Steffens, E; Hernández, H.	2019	Technological Information Magazine	Colombia	Redalyc	https://bitly.ws/384aq

Prepared by: the author.

Table 4. Results

Author	Population	Benefit	Materials	Treatment/Process	Result
Nájera, A; Pérez, M.	16 bibliographies	Strengthening the original languages of Mexico	Databases with valuable bibliographic references.	A review of the literature on how apps promote the learning of indigenous languages in Mexico is carried out, with emphasis on Chiapas.	The relationship between education and learning technologies has been crucial in teacher training, so that they develop skills in ICT, Learning and Knowledge

				With the Action-Participatory Research methodology, an educational inclusion initiative is explored with the development of an intercultural medical app, involving multidisciplinary fieldwork in four Tzeltal communities in Chiapas, through the Bats'il App.	Technologies (TAC), and Technologies for Empowerment and Participation (TEP), to positively influence their students. In short, teacher training is required that combines technical, pedagogical and didactic aspects, with a focus on cultural and linguistic relevance.
Fernández, C; Hernández, N.	29 bibliographies	To build a dimension of general work with the opening of other routes of transformation in language teaching with the support of technology with a multimodal and multilingual perspective under a synergistic dynamic.	Databases with research and documents whose information is verified.	The challenges of language teaching and how it has overcome them with the help of technology are reviewed and analysed. The studies presented reflect a renewed era in technology-mediated teaching, focused on updated criteria of quality and innovation as pillars of global education. Four practical cases on learning environments are presented, in English, Spanish and French, exploring different contexts and technological tools such as MOOCs and apps for learning one or more second languages.	The importance of a critical analysis of technological contexts in the teaching of second languages is highlighted, essential both to understand the social and individual reality, and to promote a pedagogical revolution that involves all participants in this educational process. In addition to the advantages that technology offers to education, there are areas for improvement such as quality, its integration into continuous learning and harmonization with the traditions of different languages and pedagogical theories.
Ruiz, U; Ampudia, M; Salgado, C.	73 English language teachers.	Identify the process of teaching English with the use of technology in undergraduate studies.	Background Questionnaire Instrument Professors of the UAEMex. Google	A descriptive quantitative inquiry is developed to delve into the study problem. A specialized questionnaire is applied to UAEMex teachers. Teachers have been using technologies and various teaching mechanisms, such as project-based learning, for more than 5 years.	Teachers have the digital skills required by the UAEMex standards to teach English, this facilitates their incorporation into a globalized educational context.
Espinosa, J; Villamar, J; Quijije, K; Mesa, J.	14 investigations	Analysis of the use of information and communication technology in the third-level academic field in Ecuador.	Databases with research and documents whose information is verified.	Review of studies developed in the period 2019 – 2020 on the use of ICT by teachers in the practice of academia. The favorable use of ICTs at all levels of education is observed after 2019 due to the confinement induced by the global health emergency.	ICTs are used in various ways by teachers, which has conceived innovation in education; however, it is essential to constantly review the methodology implemented by teachers.
Navarrete, E.	15 bibliographies	Rethink teaching-learning methodologies in the language classroom with the incorporation of digital competence in educators and students.	Databases with research and documents whose information is verified.	Review of the literature on teaching and its relationship with technology. Description of the educational proposals in the area of languages and presentation of the evolution of ICT in the educational field, i.e. its transition to CAT and TEP.	ICT and CAT have been integrated into various everyday aspects, where they reflect their versatility and educational potential on the Web and social networks, which has led to a significant change in the teaching and learning paradigm that

					fosters the empowerment and participation (TEP) of the members who are part of the teaching-learning process.
González, M.	10 bibliographies	To understand the connotation of the use of language in communication and its value in bilingual education in third-level teachers who train professionals capable of being part of society under a diverse and open communication system.	Databases with research on the subject.	The literature reviews denote that ICTs facilitate communication in a globalized and technologically advanced world; TACs offer innovative resources for a more effective pedagogy, adapted to current educational demands; and TEPs provide a forum for global communication, essential for equitable participation in the socio-technological environment.	ICT, TAC, TEP environments for bilingual education, which combine technology, pedagogy and communication, emerge as a solution for universities to social needs.
Araque, D; Rodríguez, S.	20 people	To analyze the relevance for postgraduate education in bilingualism through an online program.	Databases with studies related to the subject. Interview. Survey.	The background of the problem is reviewed. The study sample is taken for the application of a semi-structured interview (experts) and survey (students, graduates and administrative staff of languages and programs similar to bilingualism).	There is a need to expand the educational focus on bilingualism through educational programs that promote its value, linguistic equity, and the recognition of sociocultural diversity in educational communities. Virtuality is recognized as a means that facilitates interaction between diverse communities, overcomes the barriers of physical educational spaces and encompasses human, linguistic and social diversity. In short, bilingualism can be promoted globally with an inclusive and broad vision through postgraduate programs.
Díaz, M; Camargo, R.	11 bibliographies	To propose a critical perspective on the teaching of the English language through the use of the COIL scheme and digital resources.	Databases with research and documents whose information is verified.	Approach to the concepts and theories related to the development of intercultural competencies through teamwork. Review of the implementation of the COIL (collaborative online international learning) methodology in the teaching and learning of foreign languages.	Virtual and international collaboration leads to remarkable progress in students' behaviour and technological autonomy, as it improves their ability to navigate the organisational structures of knowledge. We live in an age of collective intelligence where the student evolves from being an observer to being a main actor in his or her own educational process.
Ramón, D; Smulders, M	25 people	Description of the impact of ICT, CAT and TEP on the education of language students (Spanish-Guarani bilingualism and	Databases with information on the subject. Survey Interview	A qualitative and quantitative approach is addressed to collect data on the topic studied and describe it. Likewise, a sample made up of students and teachers of languages, as well as specialists in the field of ICT, are chosen.	Language teachers encourage the use of ICTs, such as virtual platforms, PowerPoint, tutorials, etc., to reinforce language learning. Both teachers and students use multimedia resources for

		English language) at the National University of Itapúa.			teaching and learning (TAC). But, in relation to TEP, there is no active collaboration between teachers, students and staff immersed in the creation of new content in virtual communities.
González, M; Ojeda, M; Pinos, P.	16 bibliographies	Description of the use, benefits and disadvantages of the use of ICT, CT and its transition to PET.	Databases with research and documents whose information is verified.	Concepts and theories are reviewed on key aspects such as: the revolution of education as a product of technology, the passage of ICT and CAT in TEP through social networks, and the limitations faced by these technologies in the field of training.	The early introduction of ICT is crucial to develop future skills in CAT and TEP, promoting meaningful learning and fostering inventive and reflective learners, essential for today's society. In addition, its proper use transforms the roles of teachers and students towards a more interactive education, which also involves parents in the educational process.
Otero, O; Esteves, Z; Suárez, D; Montalván, M.	12 bibliographies	Description of ICT, CAT and PET as techno-pedagogical actions that have to be used by the university professor.	Databases with research and documents whose information is verified.	Work is done on the collection of informative data from previous research on the subject of study. Subsequently, the analysis of its content is carried out and systematically presented throughout the research.	Higher education in Ecuador needs to continue its process of reinventing itself and adapting to the challenges imposed by the Information Society and the digital environment, with a focus not only on the use of devices, but also on their application for educational purposes. Although Ecuadorian students are digital natives, they do not optimally use technological resources in their daily education, and many teachers, categorized as Digital Immigrants, are in the group of Digital Illiterates, which generates concern and requires attention in state policies for their improvement.
Palacios, F; Espejo, R.	1 case study	Reflection on language learning (English) and the possibilities offered by it when assisted by a computer and study the case of BBC Learning English.	Databases with information on the subject. Technical instrument: LinguApp assessment.	It begins with a review of the literature on technology and language learning, in this sense it analyzes the development of the CALL and TELL approaches to overcome the challenges of the use of technology in the language classroom, it is dictated to the online tools used to learn languages, particularly BBC Learning English.	In an environment defined by migration, labor demands, and economic and social inequalities, technology emerges as an essential resource for foreign language learning, making it imperative to adopt new technologically integrated educational methods. In this sense, ICT, TAC, TEP, optimize the learning of LE because they provide ample flexibility and effectiveness compared to other ways of teaching.

					increase motivation and accessibility to resources on the part of students and make the process freer.
González, P; Ochoa, C; Cabrera, P; Quiñonez, A; Castillo, L.	56 student	Use digital comic strips to teach writing in English as a foreign language to third-level students at a University in Ecuador.	Investigative background. Diagnostic evaluation. Final evaluation. Survey of perceptions. Digital comic strips.	It begins with a review of the background on the subject. The study sample is chosen for the application of previously defined instruments. They use the comic strip as a resource in teaching writing in English.	The implementation of digital comics in education has shown an increase in student motivation, as it contributes significantly to the improvement of writing skills, including grammar and vocabulary. In addition, students have expressed favorable opinions about the use of these digital resources as effective tools for strengthening their writing skills.
Casimiro, L; Torres, H.	12 teachers	Presentation and comparison of the points of view of Chilean and Colombian teachers on disruptive technologies in the teaching of English as a foreign language.	Databases with studies related to the subject. Semi-structured interview. Focus group.	Important aspects that concern the subject of study are reviewed, such as the teaching of the English language as a foreign language as a foreign language and disruptive technologies, and the scheme of Europe as a reference for digital teaching skills in universities.	The lack of specific training in technopedagogy, together with adequate staffing and supervision, limits the ability of English teachers to adjust and implement innovative and coherent teaching methods and activities in a technologically mediated environment. This denotes an opportunity to re-evaluate and update training policies and programmes in the teaching of English as a foreign language, focusing on this area.
Sánchez, M; García, J; Steffens, E; Hernández, H.	50 bibliographies	Analysis of the transformation of pedagogical actions in tertiary education with the use of information and communication technologies in recent times.	Databases such as Scielo, Elsevier, Springer, among others.	Review of concepts related to the theoretical bases of the problem: pedagogical strategies and information and communication technologies. Description of the methodology, which was oriented to the documentary field. The results are presented in the global educational field and in the process of third-level pedagogy.	The implementation of pedagogical strategies with ICT at all educational levels emphasizes training the teacher as a key agent to promote differentiated learning. However, these strategies must be aligned with contemporary pedagogical theories and discoveries in cognitive neuroscience, which are redefining traditional educational models. Even the positive participation of students and teachers in educational processes with ICT is strengthened when their interests are aligned.

Prepared by: the author.

4. Discussion

The results show that ICT, CAT and PET are indeed used as tools in the teaching of the English language in universities both nationally and internationally. This is based on the premise that recognizes the latent relationship between education and technology in the field of learning.

In this sense, authors such as Nájera and Pérez recognize that, prior to the use of these tools, teachers are committed to constantly training themselves to develop technological, pedagogical and didactic skills that allow them to positively influence their students when it comes to training them as speakers of another language other than the native one. (2020)

This is necessary since research such as that of Casimiro and Torres has shown that the lack of specific training in technopedagogy, together with adequate staffing and supervision, limits the ability of English teachers to adjust and implement innovative and coherent teaching methods and activities in a technologically mediated environment. (2023)

If this first challenge is not overcome, the teacher would face other limitations such as; problems in the integration of technology, in student participation, in access to educational resources, in online communication and cooperation, in their development as professionals due to their pedagogical outdatedness whose impact also falls on the evaluation of learning. (Sierra y otros, 2018)

This also shows an opportunity to reevaluate and update training policies and programs in the teaching of English as a foreign language, focusing on this area (Casimiro & Torres, 2023).

Likewise, the importance of a critical analysis of technological contexts in the teaching of second languages is highlighted because it is an essential step both to understand the social and individual reality, and to promote a pedagogical revolution that involves all participants in this educational process (Fernández & Hernández, 2018).

Cuetos et al. agree with this, mentioning that this analysis ensures that the integration of technology is effective, relevant, and equitable, including to maximize the potential of technology for the benefit of language learning. (2020)

All this occurs because it promotes the evaluation of the quality of the content to be taught, helps to understand the needs of learners, promotes their autonomy, encourages evaluation, feedback, critical thinking, and digital literacy (Cabero & Palacios, 2021).

In a complementary way, Fernández and Hernández consider that technology provides language education with areas of improvement such as quality, its integration into continuous learning and harmonization with the traditions of different languages and pedagogical theories. (2018)

When addressing these theoretical aspects in the praxis of language teachers, Ruiz et al. identify that, at the Autonomous University of the State of Mexico (UAEMex), teachers have the digital skills required by the standards defined to teach English, which facilitates their incorporation into a globalized educational context. (2023)

On the one hand, it can be seen that language teachers encourage the use of ICTs, such as virtual platforms, PowerPoint, tutorials, etc., to reinforce language learning, and multimedia resources for teaching and learning, although on the other hand, TEPs do not have the same luck since there is no active collaboration between teachers. students and staff immersed in the creation of new content in virtual communities (Ramón & Smulders, 2022).

However, Navarrete differs from this argument because after his bibliographic review he concluded that ICT and CAT have been integrated into various daily aspects, where they reflect their versatility and educational potential on the Web and social networks, which has led to a significant change in the teaching and learning paradigm that fosters the empowerment and participation (TEP) of the members who are part of the teaching-learning process. (2018)

In this sense, it is clarified that by not operating in TEP within the teaching of the English language, several problems and limitations may arise, both for teachers and for students, since it refers to the effective and reflective integration of technology in education, the omission of which can have negative effects (Peña and Ortega, 2019).

Among these consequences, Carneiro et al. cite student demotivation, the waste of technological resources, challenges in preparing students for today's world, limitations in the diversification of teaching mechanisms, obstacles in the accessibility of current and authentic information that would lead to a less effective and rich educational experience for both teachers and students. (2021)

In response, González et al. bet on the use of digital comic strips to teach writing in English to Ecuadorian university students. In fact, they achieved an increase in student motivation, as this resource contributed significantly to the improvement of writing skills, including grammar and vocabulary. (2020)

Likewise, the students expressed favorable opinions about the use of these digital resources as effective tools for strengthening their writing skills. (González y otros, 2020)

Each study confirms that technology has conceived innovation in education; but it is still essential to constantly review the methodology implemented by teachers. They also emphasize that ICT, TAC, TEP environments for bilingual education, which combine technology, pedagogy and communication emerge as a solution for universities to social needs. (Espinosa y otros, 2023) (2018)

Under this scenario, Araque and Rodríguez estimate the prevalence of the demand to expand the educational focus on bilingualism through postgraduate educational programs that promote its value, linguistic equity, and the recognition of sociocultural diversity in educational communities. (2021)

This action in collaboration with the virtual leads to a remarkable progress in the behavior and technological autonomy of students, as it improves their ability to navigate the organizational structures of knowledge. This is essential in an era of collective intelligence where the student evolves from being an observer to being a main actor in his or her own educational process (Díaz & Camargo, 2022).

Although this research is carried out in the peculiar case of universities, González et al. warn about the early introduction of ICT because they are the pillar for developing future skills in CAT and PET, which at the same time facilitate the promotion of meaningful learning and forge inventive and reflective students, essential for today's society. (2020)

The authors' recommendation is based on the fact that the appropriate use of these technologies transforms the roles of teachers and students towards a more interactive education, which also involves parents in the educational process. (González y otros, 2020)

In the particular case of tertiary education in Ecuador, Otero et al. argue that it needs to continue its process of reinventing itself and adapting to the challenges imposed by the Information Society and the digital environment, with a focus not only on the use of devices, but also on their application for educational purposes. (2023)

However, the researchers suggest that the strategies that are formulated in this process emphasize training the teacher as a key agent to promote differentiated learning, while aligning with contemporary pedagogical theories, discoveries in cognitive neuroscience that are redefining traditional educational models and the interests of students. (Sánchez y otros, 2019)

In summary, ICT, TAC, TEP are tools that optimize the learning of foreign languages (in this case English) in universities because they provide ample flexibility and effectiveness compared to other ways of teaching, in turn, they increase the motivation and accessibility to resources on the part of students and make the teaching-learning process freer (Palacios and Espejo, 2018).

5. Conclusions

The culmination of this systematic review regarding ICT, CAT and PET as tools in the teaching of the English language in universities leads to the following conclusions:

The early introduction of ICT in the teaching of the English language taught in universities is crucial to develop future skills in CAT and TEP, from the promotion of meaningful learning and the encouragement of inventive and reflective students, essential for today's society.

These technologies are also essential in modern English language education because they drive innovation and creativity in learning, promote the active participation of university students, and facilitate a more personalized education. For this reason, they allude to fundamental inputs to raise the educational quality of the English language and equip university students with skills to face future challenges.

Likewise, a call is made to the higher education community to continue its process of reinventing itself and adapting to the challenges imposed by the Information Society and the digital environment, with a focus not only on the use of devices, but also on their application for educational purposes.

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