DEVIR EDUCAÇÃO
ISSN: 2526-849X

Teacher education in CALL for english language teaching: the use of digital objects

Formação de professores em CALL para o ensino de língua inglesa: o uso de objetos digitais

Formación de profesores en CALL para la enseñanza de lengua inglesa: el uso de objetos digitales

Oliveira, Laysa Cristina de[1]
Almeida, Patrícia Vasconcelos[2]

Abstract

Language teaching has had to adapt to the circumstances of the pandemic and social distancing, requiring the use of digital learning objects (DLOs) and knowledge in Computer-Assisted Language Learning (CALL) to ensure the continuity of teaching. Digital technologies (DTs) enable the use of multimodal resources, expanding the educational experience and allowing the teacher to act as a facilitator in guiding students. However, educators have faced challenges in using DTs, emphasizing the need for continuing education to keep pace with their evolution. Through a theoretical-conceptual approach based on relevant research in the field, this article aims to present the knowledge area involving CALL work and to discuss the use of DLOs and digital learning platforms in the context of foreign language teaching. Still, based on relevant studies, this research also aims to present the relevance and need for continuing education for teachers, highlighting the transition that education experiences in the face of the advent of technology. After analyzing the selected studies, it is understood that it is essential for educators to acquire digital competencies through continuing education, becoming agents of transformation in education, promoting a creative and innovative approach in the use of DTs for quality education in the digital age.

Keywords: Interactive learning; Education in the digital age; Continuing education; Technology

Resumo

O ensino de línguas teve de se adaptar às circunstâncias da pandemia e do distanciamento social, demandando o uso de objetos digitais de aprendizagem (ODAs) e o conhecimento em Computer-Assisted Language Learning (CALL) para garantir a continuidade do ensino. As tecnologias digitais (TDs) possibilitam o uso de recursos multimodais, ampliando a experiência educacional, permitindo que o professor atue como facilitador no guiar dos alunos. No entanto, os educadores enfrentaram desafios no uso das TDs, ressaltando a necessidade de formação continuada para acompanhar sua evolução. Por meio de uma abordagem teórico-conceitual embasada em pesquisas relevantes nesse campo de estudo, este artigo tem como objetivo apresentar a área do conhecimento que envolve os trabalhos em CALL e discorrer sobre o uso de ODAs e plataformas de aprendizado digitais no contexto do

[1] Secretaria de Estado da Educação Minas Gerais. Lavras/MG, Brasil. E-mail: laysa.oliveira@estudante.ufla.br
Orcid: https://orcid.org/0009-0006-0995-6983
[2] Universidade Federal de Lavras – UFLA. Lavras/MG, Brasil. E-mail: patricialmeida@ufla.br
Orcid: https://orcid.org/0000-0003-4382-4096

ensino de línguas estrangeiras. Ainda com base em estudos pertinentes, esta pesquisa visa também apresentar a relevância e a necessidade da formação continuada para professores, destacando a transição que a educação vivencia em face do advento da tecnologia. Após análise dos estudos selecionados compreende-se que é fundamental que os educadores adquiram competências digitais por meio de formação continuada, tornando-se agentes de transformação na educação, promovendo uma abordagem criativa e inovadora no uso das TDs para uma educação de qualidade na era digital.

Palavras-chave: Aprendizagem interativa; Educação na era digital; Formação continuada; Tecnologia

Resumen

La enseñanza de idiomas tuvo que adaptarse a las circunstancias de la pandemia y el distanciamiento social, requiriendo el uso de objetos digitales de aprendizaje (ODAs) y el conocimiento en Aprendizaje de Idiomas Asistido por Computadora (CALL) para garantizar la continuidad de la enseñanza. Las tecnologías digitales (TDs) permiten el uso de recursos multimodales, ampliando la experiencia educativa, permitiendo que el profesor actúe como facilitador en la guía de los alumnos. Sin embargo, los educadores enfrentaron desafíos en el uso de las TDs, resaltando la necesidad de formación continua para acompañar su evolución. A través de un enfoque teórico-conceptual basado en investigaciones relevantes en este campo de estudio, este artículo tiene como objetivo presentar el área del conocimiento que involucra los trabajos en CALL y discutir sobre el uso de ODAs y plataformas de aprendizaje digitales en el contexto de la enseñanza de idiomas extranjeros. También, basándose en estudios pertinentes, esta investigación tiene como objetivo presentar la relevancia y la necesidad de la formación continua para profesores, destacando la transición que la educación experimenta ante el advenimiento de la tecnología. Después del análisis de los estudios seleccionados, se comprende que es fundamental que los educadores adquieran competencias digitales a través de la formación continua, convirtiéndose en agentes de transformación en la educación, promoviendo un enfoque creativo e innovador en el uso de las TDs para una educación de calidad en la era digital.

Palabras clave: Aprendizaje interactivo; Educación en la era digital; Formación continua; Tecnología

Introduction

The teaching and learning of languages had to adapt to the new circumstances imposed by the pandemic and social distancing. In this context, understanding the principles of Computer-Assisted Language Learning (CALL) and knowing how to use digital learning objects (DLOs) has become even more important to ensure the continuity of educational activities.

It is worth noting that CALL is an interdisciplinary field that examines the relationship between technology use and the teaching of foreign languages (Warschauer & Healey, 1998;

Leffa, 2016). Meanwhile, DLOs are tools that can enrich the teaching and learning process by making the educational environment more interactive and engaging for students, potentially fostering a more dynamic learning experience (Rojo, 2017). Thus, it is essential for teachers to engage in a continuous process of acquiring knowledge to keep pace with the development of digital technologies (DT) aimed at educational settings. Their selection of educational resources should be based on relevant criteria for their community, such as the quality of materials and their interactivity.

One of the greatest challenges for teachers is creating meaningful and active learning systems, rather than persisting with static teaching methods, which are now widely regarded as obsolete. Considering studies that indicate (Huber *et al*., 2018; Inácio *et al*., 2019) that early familiarity and exposure to technology can facilitate the adoption and use of digital resources by children and young people, it is also important to recognize that ease of use of DT can be influenced by other factors such as education, access, and support.

According to Palfrey (2011, p. 135), "[…] the world of digital media offers users the possibility not only to interact with their peers but also with content." In agreement with Palfrey, Moran (2013) argues that, with DTs, schools can transform into rich spaces for significant learning, both face-to-face and digital. This transformation aims to motivate students to learn actively and to engage in constant research while encouraging them to become proactive and take the initiative in interacting with one another.

In this context, Feenberg (2013, p. 59) asserts: "Every worthwhile discovery addresses some aspect of the human condition, fulfills a basic need, or extends human faculties." In education—the scope of this study - this is no different. Teachers must adapt and engage in an ongoing process of acquiring knowledge to keep up with the rapidly evolving digital era in education. They must identify in DTs a pedagogical alternative to teach and facilitate language learning by using DLOs, as highlighted by Reis (2010).

Reis (2010) warns of the consequences of indifference that researchers and teachers may exhibit toward cyberspace and its social practices. This indifference is one of the challenges faced in the school context, compounded by teachers' lack of skills in handling and utilizing DTs. A viable solution to address this "inability" is continuous professional development. Even though many teacher education programs today include courses on the use of DTs in education, the ongoing evolution of digital technologies demands constant learning. For teachers who graduated longer ago, there is often a greater need to develop new skills for

the educational use of DLOs.

It is important to highlight that cyberculture has transformed teaching and learning, making it more interactive, dynamic, and flexible. These changes have led to a redefinition of the teacher's role, emphasizing that they should act as facilitators of the learning process rather than as sole bearers of knowledge. Veloso (2018) underscores that the dynamism of DTs makes it challenging for teachers to stay updated and in continuous training to effectively incorporate these changes into their pedagogical practices.

Given the above, it is crucial to ask: How can continuous professional development help foreign language teachers in public schools overcome barriers to the use of DTs? Can learning to use DLOs help teachers harness the potential of these tools to enhance the quality of the language teaching and learning process?

To address these questions, this study employs a theoretical-conceptual approach grounded in relevant research in the field. Its goal is to present the body of knowledge related to CALL and to discuss the use of DLOs and digital learning platforms in the context of foreign language teaching. Furthermore, based on pertinent studies, this research aims to highlight the relevance and necessity of continuous professional development for teachers, emphasizing the transition that education is undergoing in the face of technological advancements.

Computer-Assisted Language Learning (CALL): definitions and perspectives

Language is a fundamental skill that enables us to interact with the world around us. Rousseau (2008), in his *Essay on the Origin of Languages*, identifies the word as the first social institution and language as a factor that distinguishes nations from one another - "one does not know where a man is from until he has spoken" (Rousseau, 2008, p. 259). When teaching a foreign language, beyond the language itself, it is possible to expand cultural understanding by attempting to assimilate all aspects of the context in which the language is spoken and lived.

This process can be challenging, but with the aid of digital technologies, it can become more interactive. In this sense, CALL has become an important field in foreign language teaching, as it facilitates this interaction using multisemiotic languages through various digital media.

ISSN: 2526-849X

The field of CALL, also known as Computer-Assisted Language Learning, emerged as an interdisciplinary area connected to multiple disciplines and fields, exploring the relationship between technology and language teaching (Levy, 1997). In its initial stage, CALL was still fragmented and moved in multiple directions simultaneously.

Over time, the relationship between technology and language teaching has been explored from various theoretical and practical perspectives. Blake (2008) positioned CALL as part of Applied Linguistics and the field of language acquisition, emphasizing the importance of integrating technologies into teaching and assessing their impact. Meanwhile, Crystal (2010) noted that, although relatively new at the time, CALL continued to evolve, with research focusing on how technology could enhance language learning.

More recently, Reis (2022) published *30 Years of CALL in Brazil*, revealing that the field has established itself as an area of investigation, supported by the "shoulders of academic giants", referring to renowned authors in the field of Applied Linguistics who have published work on CALL. The author uses the analogy of scaffolding, which serves as a foundation in many CALL publications, presenting a guiding perspective on language teaching that has shaped various studies in Brazil (Reis, 2022, p. 22).

Definitions and benefits

CALL is an interdisciplinary field of study aimed at examining the use of technology in the teaching and learning of foreign languages. The term was coined in the 1960s to describe the use of computers in language teaching (Levy, 1997). Since then, the field has expanded rapidly as new technologies and pedagogical practices have emerged (Chapelle, 2001).

CALL refers to the integration of technology into the processes of language teaching and learning, involving the use of digital tools and resources to enhance language acquisition and practice. It encompasses activities such as online interaction, e-learning, software development, and language learning applications. Within the context of CALL, researchers focus on aspects such as language, participants, technologies, and online pedagogy, with the goal of improving language teaching through these technologies.

As highlighted by Reis (2010), CALL can provide a range of benefits for students, including increased motivation, interactivity, and autonomy in the language learning

process. Additionally, as noted by Klimanova and Lomicka (2023), CALL can contribute to the development of students' multimodal competence, enabling them to interact with a variety of signs and meanings in digital environments.

According to Brazilian researcher Vilson J. Leffa, CALL is "the use of information and communication technology in language teaching and learning" (Leffa, 2016, p. 17). Leffa argues that CALL can enrich language teaching by providing students with access to authentic materials, enabling interaction and collaboration, and personalizing the learning process to meet individual student needs. By its interdisciplinary nature, CALL is influenced by and connected to various other fields and disciplines.

Although the definition of CALL may vary among researchers, it generally involves the use of technology to assist language teaching and learning, exploring how technology can improve this process. This includes everything from educational software to mobile applications and virtual learning environments. It is worth emphasizing that the ongoing collaboration of experts in linguistics, pedagogy, and technology is essential for the evolution of CALL and its application in education.

Perspectives in CALL

Various studies (Chapelle, 2001; Stockwell, 2012; Lévy, 2016; Reis, 2010; 2016; 2019; 2022) have highlighted the effectiveness of CALL in foreign language teaching, particularly in terms of personalized learning, interactivity, access to resources, and ease of use. Moreover, CALL can help improve the quality of teaching by providing immediate feedback to both students and teachers. According to Reis (2022), research in the field of CALL in Brazil has significantly contributed to strengthening teaching practices and research initiatives.

It is worth noting that the use of CALL must be carefully planned and implemented to ensure its effectiveness is maximized. Teachers need proper development in the use of digital technologies (DT), as well as in the selection and application of available resources. Despite its benefits, CALL implementation raises some critical issues that need to be addressed to ensure its success. Accessibility and the availability of technology for all students and teachers are relevant concerns. Studies such as Reis (2019) emphasize the importance of ensuring that the technological tools and resources used in CALL are

ISSN: 2526-849X

equitably available, preventing digital exclusion and enabling all students to equally benefit from these educational approaches.

Additionally, it is crucial to recognize that CALL should not be viewed as a one-size-fits-all solution to the challenges of foreign language teaching but rather as a complementary tool to face-to-face classes. Historical studies, such as those by Levy (1997), demonstrate that CALL must be appropriately integrated into the pedagogical context, considering learning objectives, student needs, and the pedagogical approaches employed. By doing so, CALL can enrich teaching practices, offering opportunities for interaction, autonomous practice, and access to authentic resources, while aligning with sound curricular planning to serve as a complement.

One of the advantages of CALL is the possibility of greater autonomy for students over their own learning processes, allowing them more control over content, time, and pace of learning. In addition to offering flexibility in their learning journey, it also provides opportunities to connect with students worldwide, enriching the experience of studying foreign languages.

Reis (2010) describes the efforts of different research groups to foster the existence of a discursive community in CALL, which, in the Brazilian context, is guided by four thematic axes: language, participants, technologies, and online pedagogy (Reis, 2010, p. 83). According to the author, language is conceived as a social and cognitive phenomenon resulting from the interaction of participants through digital and multimodal genres. In cyberspace, participants assume different roles in online interaction contexts, using and evaluating DTs based on their individual perceptions. This evaluation of technologies, particularly for language teaching and learning mediated by CALL, considers the available resources and instructional materials and how they are applied in practice.

In terms of online pedagogy, there is a growing concern about discussing the presentation and analysis of proposals or frameworks for educational practices in digital contexts. Over the past three years, the primary focus has been on educational practices within the digital environment, including the development of digital instructional materials and the use of games in additional language classrooms (Reis, 2010, 2022). These efforts can pose challenges when educational environments and/or education professionals lack the expertise or are not adequately trained to utilize DTs in their contexts.

ISSN: 2526-849X

Challenges and controversies

Considering that CALL is a constantly evolving field offering numerous possibilities to enhance and diversify how languages are taught and learned, it is undeniable that there are challenges and controversies to be addressed in its context. As discussed by Levy (1997) and Hubbard (2013), CALL must be appropriately integrated into the pedagogical context, considering learning objectives, student needs, and the teaching strategies employed (Chapelle, 2001; Stockwell, 2012).

CALL has faced criticism from some scholars who argue that it may replace face-to-face interaction and authentic human communication. While it presents undeniable benefits for language teaching, some researchers have highlighted its limitations. Long (2015) advocates meaningful interaction in the language learning process and argues that CALL should be used as a tool to complement, rather than replace, face-to-face interaction. He emphasizes that human interaction provides rich nuances and contexts that are essential for second language acquisition—experiences that technology, no matter how advanced, cannot fully replicate.

Controversies are an integral part of the academic landscape, often arising from conflicting perspectives, interpretations, or evidence. In the context of CALL, Reis (2010) identifies concerns related to the over-reliance on technology in language teaching, which were raised nearly two decades ago. According to Warschauer (2006), the indiscriminate use of technological tools can lead to the inappropriate substitution of human interactions and effective pedagogical practices. He stresses that CALL should not be considered a standalone solution but rather a complement to traditional teaching methods.

Furthermore, Warschauer (2006) emphasizes the importance of interactions between students and teachers, as well as among students themselves, for linguistic and communicative development. Such interactions foster communicative skills, oral practice, and the negotiation of meaning. Replacing these human interactions with activities solely based on technology risks compromising essential aspects of language learning. Despite the passage of time, the concerns and insights of Warschauer remain relevant. Participants in the technology-mediated teaching and learning process continue to share the concerns he raised, particularly regarding the inadequate substitution of human interactions.

The perspectives provided offer a relevant conceptual foundation for discussing the

controversy surrounding the excessive reliance on technology in CALL. Warschauer's insights underscore the need to carefully consider the role of human interactions in the learning process and to integrate technology thoughtfully into the pedagogical context, maximizing its benefits while minimizing the risks of over-reliance on digital tools.

Equitable access to technology also remains a central concern in studies involving CALL. Authors such as Hubbard (2008) and Levy (2009) have extensively discussed inequalities in technology access, highlighting that economic barriers, inadequate infrastructure, and regional disparities hinder equal opportunities for students to utilize CALL tools and resources. These inequalities can create gaps in access to quality education, negatively affecting learning opportunities for certain groups of students. Addressing these issues and finding solutions to ensure equitable access to CALL is essential to promote inclusive and equitable education.

Returning to contemporary challenges, nearly 20 years after these authors' observations, the COVID-19 pandemic posed significant difficulties for the use of digital technologies due to abrupt changes in the remote teaching and learning process. The sudden transition to remote teaching led to issues related to technological access and teachers' lack of familiarity with digital tools. Empirical evidence revealed the difficulties educators faced in this challenging context, including unfamiliarity with digital platforms and insufficient training, which hindered the transition to online teaching.

Reis (2022) highlights that the lack of adequate infrastructure constitutes a barrier that prevents the implementation of many recommended educational strategies, which often fail to materialize effectively in school settings.

The controversies surrounding CALL reflect both the challenges and opportunities of using digital technologies to teach a foreign language. It is a dynamic field, where diverse perspectives contribute to its ongoing development and effective application. This leads us to the next section, which offers suggestions for introducing digital technologies into public schools.

DLOs in english language teaching in Brazilian public schools

Digital learning objects (DLOs) are technological resources that can be used by teachers to enrich the teaching and learning process in various areas of knowledge,

ISSN: 2526-849X

including English language teaching. They enable the creation of a more interactive and engaging learning environment for students. According to Leite and Correia (2021), DLOs are pedagogical resources specifically designed for educational purposes, with features that allow their use in diverse learning situations. They facilitate the approach and exploration of different content areas and are easy to use, enabling students to focus on learning without wasting time on execution. In today's information society, the use of DLOs has become increasingly common in classrooms.

Rojo (2017) states that DLOs are widely used and frequently referenced in academic literature. They encompass not only DLOs themselves, but also digital lesson plans and activities derived from them. Although these materials are widely available on the internet, they can also undergo processes of curation, organization, cataloging, indexing, and subsequent availability in public repositories, often accessible for free.

The use of digital resources allows for more dynamic learning through activities such as games, videos, and other media that can assist in content understanding and retention. Various examples can enrich the teaching and learning process in different areas, including English language teaching, such as educational games, simulators, interactive infographics, educational videos, audio recordings, podcasts, and mobile applications.

These examples demonstrate the wide range of tools available to enhance learning. Incorporating them into English classes in public schools can be a promising approach to promoting meaningful learning for students. Moran (2008, p.1) asserts that schools need to relearn how to be meaningful in every sense, with "educators organizing more meaningful activities than merely expository classes, acting effectively as mediators rather than informers". Based on Moran's perspective, it becomes clear that regardless of the resources used, teachers should focus on creating conditions for learners to optimize the teaching and learning process.

From this perspective, DLOs can serve as an additional tool to spark students' interest and motivation, transforming them from passive spectators into active participants in their learning journey. In an age of abundant information, learning today involves searching, comparing, researching, producing, and communicating. Moran also highlights a long-standing concern: schools without internet access fail to prepare students adequately for their future and for the country's development (Moran, 2008).

A decade after Moran's reflections, e-learning platforms, as demonstrated by

ISSN: 2526-849X

Kukulska-Hulme *et al.* (2019), offer a wide range of interactive resources that enhance student participation and collaboration. Educational videos help develop listening comprehension and enrich students' cultural repertoire. Simulators and virtual reality provide immersive experiences that stimulate motivation and active participation. Additionally, the use of podcasts and authentic audio materials aims to improve listening comprehension and pronunciation in the language teaching and learning process. By adapting these DLO resources, English teachers in public schools can create more dynamic and interactive lessons, offering students a stimulating and effective learning environment that fosters practical situations to which they can relate and feel motivated.

DLOs can also be beneficial for teachers, allowing them to provide diverse content with varying levels of complexity tailored to the learning objectives of each group. This enables teachers to adapt the content to the specific needs of their students, contributing to a more creative learning process.

However, certain factors must be considered by teachers when deciding which DLOs to use. According to Pessoa (2015), given the wide range of options available in digital media, the quality of the material is an important factor. DLOs must present accurate, up-to-date, and reliable content, with well-structured and organized material. Moreover, DLOs should be interactive and include activities that actively engage students in the learning process. Otherwise, they risk resembling traditional materials used in classrooms.

Another aspect to consider is the use of DLOs in English language teaching in association with the TPACK model (Technological Pedagogical Content Knowledge)[3]. According to Koehler (2008), TPACK refers to the technological, pedagogical, and content knowledge that teachers need to effectively use technology in their pedagogical practices. Cibotto and Oliveira (2018) argue that the association between TPACK and DLOs can foster the development of more innovative pedagogical practices, enabling teachers to use DTs more effectively and providing students with higher-quality education tailored to each teaching and learning context.

In the context of language teaching, TPACK can help teachers integrate best pedagogical practices, disciplinary knowledge about the language, and technological competence to select, adapt, and use DLOs. This approach enables teachers to explore the potential of DLOs—such as educational games, mobile applications, videos, simulations,

[3] The TPACK framework will be explored in greater depth in Section 3 of this article.

virtual reality, and podcasts—to create more engaging and interactive learning experiences.

Thus, using DLOs in English language teaching in public schools in Brazil can be an effective strategy to foster students' skills and competencies while making the teaching and learning process more engaging.

The effectiveness of using DTs in the form of DLOs in education depends on understanding the interplay between three knowledge areas: pedagogy, technology, and specific content. This interdependence requires teachers to develop competencies that enable them to understand various DTs and their pedagogical potential. Such understanding is essential for selecting the most appropriate tools to achieve teaching and learning objectives.

In the context of contemporary education, marked by the growing integration of DTs in teaching and learning processes, several studies (King, 2002; Harris & Hofer, 2009; Rientes *et al.*, 2013) recognize the relevance of a holistic model that considers not only the creation of courses and activities with DTs but also the initial and ongoing training of teachers for their pedagogical use.

Therefore, investing in the continuous professional development of teachers for the use of DTs is essential to ensure that these tools are employed in ways that promote meaningful learning for students. This training should address the various aspects involved in using DTs in education, with special attention to the TPACK model and its applications in language teaching. This integration of DLOs in language teaching leads us to the next section, where this topic will be further explored.

Continuous professional development of teachers for the use of digital technologies (DTs)

Since its inception, education has been one of the primary means of fostering human and social development. However, over the years, the methods of teaching and learning have undergone significant transformations. Technology is now a pervasive reality in all areas of life, including education. In this context, the continuous professional development (CPD) of teachers, with a focus on the principles of CALL and the use of resources such as DLOs, becomes essential.

As early as 2012, Almeida warned of the need to restructure foreign language teacher

training programs to include DTs. Although Almeida's work primarily addressed initial teacher education—when the integration of DTs as a methodological approach was already considered indispensable - this theme has become even more critical for CPD programs targeting teachers who did not have the opportunity to explore these technologies during their undergraduate studies.

In the current educational landscape, it is crucial for teachers to invest in their own education, not only to improve their skills but also to naturally integrate DT resources into the classroom, enriching pedagogical materials. More than a decade ago, Levy (2010) highlighted the importance of considering how our relationship with knowledge is changing when thinking about the future of education in the digital age. One particularly relevant point is the speed at which knowledge evolves. For the first time in history, many of the skills learned early in a career may become obsolete by its end.

Today, it is understood that the expertise of a teacher extends far beyond simply transmitting content and assessing students. The 21st-century teacher needs a holistic perspective and must be prepared to address the challenges of education. These include adapting to new technologies and pursuing continuous professional development. By consistently updating their knowledge, teachers can develop the skills needed to utilize digital tools, thereby enhancing their classes to help students develop communication and digital literacy[4] skills. Additionally, they can stimulate students' reasoning and autonomy. Education, therefore, can no longer be viewed as merely a preparatory phase for a profession, such as teaching; it must be seen as an integral and permanent part of life.

It is important to emphasize the need for teachers to know how to use technology in a pedagogically sound and appropriate way. In this sense, CPD becomes fundamental, as it should be regarded as a dynamic process aimed at equipping teachers with new skills and competencies to effectively integrate DTs into their pedagogical practices.

As DTs continue to transform teaching and learning, making them more interactive, dynamic, and flexible, these changes have led to a redefinition of the teacher's role. Veloso (2018) underscores this by noting that:

> "(...) the use of digital technologies demands specific and complex knowledge. Mastery of a particular software, for instance, is no longer sufficient, as technological resources are in constant flux, becoming

[4] Digital literacy refers to the social practices of reading and producing texts in digital environments, involving the use of texts on electronic platforms such as emails, social networks, and online search engines. It requires skills to understand, evaluate, and produce information in various multimodal formats. (Ceale Glossary, 2014)

ISSN: 2526-849X

obsolete in a rapid and uninterrupted manner." (Veloso, 2018, p. 154)

The dynamic nature of digital technologies again highlights the necessity for teachers to remain updated and engaged in ongoing training, enabling them to keep pace with changes and effectively incorporate them into their pedagogical practices. This implies that CPD programs should provide teachers with the knowledge and skills to use DTs effectively, thereby promoting high-quality education aligned with the demands of the contemporary world.

The growing use of digital media in the teaching and learning process has necessitated CPD programs that also address the principles of technological, pedagogical, and content knowledge (TPACK) underlying the integration of DTs into education. These programs should not only equip teachers with the technical skills to operate digital tools but also foster a robust understanding of how these technologies can be meaningfully applied in various educational contexts.

Unveiling the theory behind technology integration in education

TPACK encompasses the ability to design digital activities and resources that promote active student participation, encourage collaboration, and foster knowledge construction.

In this context, we highlight the importance of Koehler and Mishra's (2006) work, emphasizing how they influenced the pedagogical field with technology integration and became a significant reference. In their seminal article titled *"Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge,"* published in 2006 in the journal *Teachers College Record*, Mishra and Koehler introduced the TPACK framework.

In this work, the authors proposed an innovative approach to understanding how teachers integrate pedagogical knowledge, content knowledge, and technological knowledge to effectively teach their students. TPACK acknowledges the importance of combining technical, pedagogical, and content expertise, especially in using DTs in education. Since then, the TPACK framework has been widely adopted and discussed in teacher training and educational research, becoming a key reference in the field.

Teaching today increasingly demands reflective professionals who are adaptable to the ever-evolving demands of society. In this context, integrating DTs into the teaching and

learning process emerges as essential for preparing critical citizens equipped to face future challenges.

Against this backdrop, the TPACK model plays a critical role by providing a comprehensive theoretical framework for understanding the complex interconnection between technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK).

- **Technological knowledge (TK):** TK refers to a deep understanding of available technological tools and resources, their functionalities, and their potential applications in teaching. However, TK is a dynamic domain in constant flux. Unlike the other two domains (pedagogy and content), TK faces specific challenges due to the rapid evolution of tools and resources. Consequently, precisely defining TK is complex, as any definition risks becoming quickly outdated.

Contextual integration is also essential in TK. Knowing how to use a technological tool is insufficient; it is necessary to understand how it aligns with teaching objectives, curricular content, and pedagogical strategies. Technology must be applied meaningfully and relevantly to enhance student learning.

Another critical aspect is the critical assessment of technologies. Educators must analyze available technological tools and resources, considering factors such as privacy, accessibility, security, and pedagogical effectiveness. This careful analysis ensures that the technologies employed meet students' needs and promote a safe and effective learning environment.

Finally, TK involves creativity and innovation. This means exploring new approaches and adapting existing technologies to meet specific classroom needs. Educators must be open to experimentation and seek innovative solutions to enhance students' learning experiences.

- **Pedagogical knowledge (PK):** PK represents teachers' understanding of teaching and learning processes, practices, and methods. It includes general educational purposes, values, and objectives. This form of knowledge encompasses understanding how students learn, general classroom management skills, lesson planning, and student assessment. PK includes knowledge about classroom techniques or methods, the nature of the target audience, and strategies for assessing students' understanding (Harris, Koehler, & Mishra, 2009).

ISSN: 2526-849X

PK involves mastering different pedagogical approaches and teaching strategies, such as active methodologies. By implementing methods that place students at the center of the learning process, teachers can foster greater engagement and autonomy in their education. These practices include project-based learning, blended learning, and flipped classrooms, which encourage collaboration, problem-solving, and the practical application of knowledge.

By adopting these approaches, teachers create a more dynamic and interactive learning environment and prepare students to address real-world challenges where autonomous and collaborative learning skills are increasingly valued. Furthermore, integrating active methodologies allows teachers to tailor their teaching to individual students' needs, offering a more personalized and meaningful educational experience.

- **Content knowledge (CK):** CK refers to expertise in the specific subject area that a teacher teaches, encompassing its concepts and theories. As outlined by Mishra and Koehler (2006), CK is the specific knowledge of a discipline's content. It involves understanding the concepts and principles underlying a field of study. For teachers, CK is essential, as it enables them to convey content meaningfully and relevantly to students. CK also allows for identifying connections between different topics and selecting appropriate teaching strategies for specific content. Therefore, CK serves as the foundation upon which teachers build their pedagogical practices (Mishra & Koehler, 2006).

The TPACK Model as a key to teacher education

The TPACK framework transcends the mere combination of the three knowledge domains. It resides at the intersection of these domains, where teachers develop the ability to select and adapt technologies, choosing the tools that are best suited to learning objectives and tailoring them to the characteristics of the students and the content (Mishra & Koehler, 2006).

Furthermore, it is essential to develop innovative strategies for creating activities and learning experiences that integrate effective pedagogies with technological resources in creative and innovative ways, as highlighted by Mishra and Koehler in 2006. This approach requires a careful combination of pedagogical methods with the creative use of DT, aiming to foster meaningful and engaging learning experiences for students.

ISSN: 2526-849X

Thus, TPACK serves as a fundamental pillar in the continuous professional development of teachers, driving the transformation of pedagogical practices. It helps teachers develop the skills needed to use DTs appropriately, promoting knowledge construction among students and facilitating the teaching-learning process. Additionally, TPACK contributes to the design of teacher education curricula focused on the educational use of technology, preparing educators to engage with 21st-century pedagogical resources (Cibotto & Oliveira, 2017).

By encouraging teachers to experiment with new tools and teaching methods, continuous professional development can provide the flexibility needed to adapt lessons to students' needs and to address the challenges of teaching.

These studies align with the reflections proposed by Levy (2010) regarding the evolving relationship with knowledge. According to Levy, this evolution underscores the urgency for teachers to develop a holistic view of their continuous professional development. This perspective goes beyond mere technological updates and includes considerations of cultural diversity and social inclusion. CPD is not limited to mastering DTs but also involves understanding students' diverse realities and promoting inclusive educational practices.

Moreover, it is crucial for teachers to develop the skills to critically evaluate the quality and relevance of available digital resources, ensuring the proper selection and responsible use of these tools in educational settings.

In summary, CPD programs should empower teachers to become proactive agents in integrating digital media, turning challenges into opportunities for a more dynamic and inclusive education. As a multifaceted process, CPD goes beyond technical training and requires a comprehensive approach that is sensitive to diversity and committed to educational excellence in the digital age.

Final considerations

The language teaching and learning process had to adapt to the new circumstances imposed by social distancing. In this context, it became clear that the use of DLOs became even more critical for ensuring the continuity of language teaching and learning during the COVID-19 pandemic. During this period, situations arose in which teachers had to learn

how to use technological resources, highlighting the need to revisit the discussion on continuous professional development for educators.

It is essential for teachers to engage in a continuous process of knowledge acquisition to keep pace with the dynamic evolution of the technological era. It is their responsibility to identify digital technologies (DTs) as pedagogical alternatives for teaching and learning. As posited in the literature, the use of digital resources can make the teaching process more appealing and motivating by creating rich spaces for meaningful learning—both in-person and digital—that encourage students to learn actively, continuously research, be proactive, take initiative, and interact.

However, it is important to emphasize that the use of DLOs must be carefully planned and implemented to ensure their effectiveness is maximized and well-utilized by those involved in the teaching and learning process. Teachers must receive adequate training on the use of technology (digital or otherwise), as well as guidance on the selection and application of available resources. Moreover, it is crucial to remember that the principles of CALL should not be viewed as a one-size-fits-all solution to the challenges of foreign language teaching. Instead, one of its key benefits lies in granting students greater autonomy and control over their learning processes. However, issues such as accessibility and the availability of technology for all students and teachers must be considered.

The selection of DLOs should be based on relevant criteria, such as material quality, interactivity, and student engagement. The content should be up-to-date, reliable, and well-structured, while also including activities that actively engage students in the learning process.

Continuous professional development based on the TPACK framework can help teachers develop the necessary competencies to utilize technological possibilities with a focus on student learning. More than just technical training, TPACK requires a comprehensive and diversity-sensitive approach, acknowledging the importance of culture, social inclusion, and educational excellence in the digital world. Through TPACK, teachers can become agents of change, building 21st-century education that prepares students for future challenges and opportunities.

In summary, continuous professional development for teachers is essential to keeping pace with the changes technology brings to education. As highlighted by Levy (2010) and Veloso (2018), the dynamic nature of DTs demands that teachers remain up-to-date and

engaged in ongoing training to incorporate these technologies effectively into their pedagogical practices. Teachers must learn to use DTs pedagogically and appropriately, with CPD serving as an opportunity for them to utilize these tools effectively, thereby promoting a high-quality education aligned with the demands of the contemporary world.

CALL and DLOs can be highly beneficial in this process, enabling a more interactive, dynamic, and personalized learning experience. However, it is crucial to remember that technology is not a panacea for the challenges of the teaching and learning process. It should be seen as a support for pedagogical practice, rather than a substitute for the teacher's role.

Therefore, continuous professional development for teachers should be viewed as a dynamic process aimed at equipping them with new skills and competencies to use DTs effectively in their pedagogical practices, thereby promoting a high-quality education aligned with the demands of the contemporary world.

References

ALMEIDA, Patrícia Vasconcelos. **A influência da tecnologia nas escolhas didático-pedagógicas dos professores pré-serviço de língua inglesa**. Revista Internacional de Ciências Humanas Volume 1, Número 2, http://lascienciashumanas.com, ISSN 2530-4526 Republicado de Revista Internacional de Humanidades 1(2), 2012 (pp. 19-34)

ALMEIDA, Patrícia Vasconcelos; FERREIRA, Helena Maria. **Formação de professores de línguas: ensino e práticas digitais.** Revista Polyphonía, Goiânia, v. 30, n. 1, p. 102–119, 2019. DOI: 10.5216/rp.v30i1.60194. Disponível em: https://revistas.ufg.br/sv/article/view/60194 . Acesso em: 8 abr. 2024.

BLAKE, Robert. **Brave new digital classroom: Technology and foreign language learning.** Georgetown University Press, 2008.

CIBOTTO, Rosefran Adriano Gonçales; OLIVEIRA, Rosa Maria Moraes Anunciato. **TPACK – Conhecimento tecnológico e pedagógico do conteúdo: uma revisão teórica**. Imagens da Educação, 7(2), 65-81, 2018. Disponível em: http://doi.org/10.4025/imagenseduc.v7i2.34615. Acesso em: Maio/2023

DOS REIS, Suzana Cristina. **Do Discurso à Prática: Textualização de Pesquisas sobre o Ensino de Inglês Mediado por Computador. 2010**. Disponível em: http://coralx.ufsm.br/desireemroth/images/admin/teses/tese_susana.pdf Acesso: Abr/2023

DOS REIS, Suzana Cristina. **30 anos de CALL no Brasil: uma área andaimada sobre "ombros de gigantes"**. Linguagem & Ensino, Pelotas, v. 25, n. especial, p. 15-38, dez. 2022 18. Disponível em: https://periodicos.ufpel.edu.br/ojs2/index.php/rle/index Acesso:

Abr/2023

FEENBERG, Andrew. **O Que é a Filosofia da Tecnologia?** In: NEDER, R. (Org.) A teoria crítica de Andrew Feenberg: racionalização democrática, poder e tecnologia. UNB. Brasília, 2013.

GOMES, Adilson Fernandes; DOS REIS, Suzana Cristina. (2019**). Jogos digitais e o ensino de línguas: orientações práticas para a produção de material didático digital complementar**. The ESPecialist, 40(2). https://doi.org/10.23925/2318-7115.2019v40i2a6

HARRIS, Judy; HOFER, Mark. **Instructional planning activity types as vehicles for curriculum-based TPACK development.** In MADDUX, C. D. (Ed.). Research highlights in technology and teacher education. Chesapeake: Society for Information Technology in Teacher Education (SITE), 2009. p. 99-108. Disponível em: https://chathamcat.pbworks.com/f/HarrisHofer-TPACKActivityTypes.pdf Acesso em: Fev/2024.

HARRIS, Judi; KOEHLER, Matthew; MISHRA, Punya. **What Is Technological Pedagogical Content Knowledge?** Contemporary Issues in Technology and Teacher Education. 9. 2009. Disponível em: (PDF) What Is Technological Pedagogical Content Knowledge? (researchgate.net) Acesso em: Jan/23

HUBER Brittany, YEATES Megan, MEYER Denny, FLECKHAMMER Lorraine, KAUFMAN Jordy. **The effects of screen media content on young children's executive functioning.** J Exp Child Psychol. 2018 Jun;170:72-85. doi: 10.1016/j.jecp.2018.01.006. Epub 2018 Feb 12. PMID: 29448235.

INÁCIO, Cláudia de Oliveira; CONTE, Elaine; HABOWSKI, Adilson Cristiano; RIOS, Míriam Benites. **Criança, infância e tecnologias: desafios e relações aprendentes**. TEXTURA - Revista de Educação e Letras, v. 21, n. 46, p. 37-58, abr./jun. 2019 https://www.academia.edu/39652920/CRIAN%C3%87A_INF%C3%82NCIA_E_TECNOLOGIAS_DESAFIOS_E_RELA%C3%87%C3%95ES_APRENDENTES Acesso: Junho/2023

KING, Kathleen Palombo. **Educational technology professional development as transformative learning opportunities.** Computers & Education, v. 39, n. 3, 2002. p. 283-297. Disponível em: http://www.sciencedirect.com/science/article/pii/S0360131502000738 Acesso em: fev/2024.

KLIMANOVA, Liudmila, & LOMICKA, Lara. (2023**). Semiotics in CALL: Signs, meanings and multimodality in digital spaces**. Language Learning & Technology, 27(2), 1–5. https://hdl.handle.net/10125/73500

KUKULSKA-Hulme, AGNES & SHIELD, Lesley. (2008). **An Overview of Mobile Assisted Language Learning: From Content Delivery to Supported Collaboration and Interactio**n. ReCALL. 20. 10.1017/S0958344008000335 https://www.researchgate.net/publication/42795774_An_Overview_of_Mobile_Assisted_La

nguage_Learning_From_Content_Delivery_to_Supported_Collaboration_and_Interaction

LEFFA, Vilson J. **Aprendizagem de línguas mediada por computador**. Universidade Católica de Pelotas, 2016.

LEITE, Cristiane; CORREIA, Joana. **Utilização de Objetos Digitais de Aprendizagem na Educação Profissional: desafios e possibilidades**. Capítulo do livro: Tecnologias e educação aberta e digital - Vol. 2 (pp.270) Publisher: EDUFRB, 2021. Disponível em: https://www.researchgate.net/publication/362903544_Utilizacao_de_Objetos_Digitais_de_Aprendizagem_na_Educacao_Profissional_desafios_e_possibilidades Acesso em: Fevereito/2024

LÉVY, Pierre. **A nova relação com o saber**. In: LÉVY, Pierre. Cibercultura. 3. ed. São Paulo: Editora 34, 2010. Cap. 10. p. 157-167. Disponível em: https://ria.ufrn.br/jspui/handle/123456789/1874 Acesso em: Abr/2023

LONG, Michael Hugh. **Second Language Acquisition and Task-Based Language Teaching**. Wiley-Blackwell, 2015.

MISHRA, Punya., & KOEHLER, Matthew J. (2006). **Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge**. Teachers College Record, 108(6), 1017-1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x 2006. Acesso em: Jan/2024

MORAN, José Manuel. MASETTO, Marcos T. BEHRENS, Marilda Aparecida. **Novas Tecnologias e Mediação Pedagógica**. 21ª edição revisada e atualizada. Campinas, SP: Papirus, 2013

PALFREY, John; GASSER, Urs; tradução de Magda França Lopes. **Nascidos na era digital: entendendo a primeira geração de nativos digitais**. Porto Alegre: Artmed, 2011.

PESSOA, Eder Gomes. **Potencialidades de objetos de aprendizagem em repositório digital para o ensino da língua inglesa**. 2015. 96f. – Dissertação (Mestrado) – Universidade Federal do Ceará, Departamento de Letras Vernáculas, Programa de Pós-graduação em Linguística, Fortaleza (CE), 2015. Disponível em: https://repositorio.ufc.br/bitstream/riufc/16219/1/2015_dis_egpessoa.pdf Acesso em: Abr/2023

RIENTES, Bart. *et al.* **Online training of TPACK skills of higher education scholars: a cross-institutional impact study.** European Journal of Teacher Education, v. 36, n. 4, 2013, p. 480-495. Disponível em: http://www.tandfonline.com/doi/abs/10.1080/02619768.2013.801073#.VPtB4Hx7Irc Acesso em: Fev/2024

ROJO, Roxane. **Entre plataformas, ODAs e protótipos: novos multiletramentos em tempos de web2**. The Especialist: descrição, ensino e aprendizagem. Vol. 38 Nº 1 jan -jul 2017. Disponível em: <Entre Plataformas, ODAs e Protótipos: Novos multiletramentos em tempos de WEB2 | The ESPecialist (pucsp.br)>

ROUSSEAU, Jean-Jacques. **Ensaio sobre a Origem das Línguas.** Trad. Fúlvia M. L. Moretto. 3ª Ed. UNICAMP, Campinas. 2008. 184 p.

VELOSO, Braian. **Saberes e Conhecimentos Docentes na Educação a Distância**. Cap. 6, (2018). Organização do trabalho docente na EaD.

WARSCHAUER, Mark; HEALEY, Deborah. **Computers and language learning: An overview**. Language Teaching, 31, 57-71, 1998. Disponível em: https://education.uci.edu/uploads/7/2/7/6/72769947/computers_and_language_learning-_an_overview.pdf Acesso: Abr/2023.

WARSCHAUER, Mark. **Laptops and Literacy: Learning in the Wireless Classroom**. New York: Teachers College Press, 2006. Disponível em: https://archive.org/details/laptopsliteracyl0000wars/page/n5/mode/2up Acesso em: Maio/2023.

Recebido: agosto/2024.
Aprovado: novembro/2024
Publicado: janeiro/2025.