

TECHNOLOGY-AFFORDED PEDAGOGY IN ENGLISH FOR SPECIFIC PURPOSES: A CONCEPTUAL FRAMEWORK

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ABSTRACT

The integration of technology in English for Specific Purposes (ESP) has become increasingly essential in response to the evolving demands of digitalized professional environments; however, current practices tend to focus more on the adoption of technological tools rather than on how these technologies can meaningfully inform and transform pedagogy. This limitation indicates a critical gap in understanding technology as a source of pedagogical affordances that can enhance context-specific language learning. Therefore, this study aims to develop a conceptual framework of technology-afforded pedagogy in ESP by synthesizing key theoretical perspectives, including ESP principles, affordance theory, and the Technological Pedagogical Content Knowledge (TPACK) framework. Employing a conceptual research design, this study utilizes a critical literature review and integrative analysis to examine how technology, pedagogy, and ESP learning needs intersect within contemporary educational contexts. The analysis reveals that technology affordances—such as interaction, collaboration, simulation, and authenticity—play a crucial role in mediating between learners' specific needs and pedagogical strategies, enabling more effective and meaningful ESP instruction. Based on these findings, the study proposes a multi-layered conceptual framework that positions technology affordances as a central component in designing pedagogically sound and context-responsive ESP learning environments. In conclusion, this study contributes to the theoretical development of ESP by offering a structured and integrative model that shifts the focus from technology use to technology-informed pedagogy, providing practical implications for educators and material developers while also establishing a foundation for future empirical investigations in ESP contexts.

Keywords: English for Specific Purposes (ESP); technology affordances; pedagogy; TPACK.

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1) INTRODUCTION

The rapid advancement of digital technology has profoundly transformed educational practices across disciplines, including the field of English Language Teaching (ELT) (Hockly, 2018; Warschauer & Meskill, 2000). Over the past decade, the proliferation of digital tools, online platforms, and interactive learning environments has reshaped how knowledge is accessed, constructed, and disseminated (Selwyn, 2016). In higher education, these developments have encouraged educators to move beyond traditional teacher-centered approaches toward more flexible, learner-centered, and technology-enhanced pedagogies (Kukulska-Hulme, 2020). Within this evolving landscape, English for Specific Purposes (ESP) occupies a particularly important position, as it is inherently tied to the communicative demands of specific academic and professional domains (Dudley-Evans & St John, 1998). Unlike general English instruction, ESP emphasizes context-specific language use, discipline-oriented communication, and the development of skills that are directly applicable to real-world situations (Hutchinson & Waters, 1987). Consequently, the integration of technology in ESP is not merely a matter of convenience, but a strategic necessity for aligning instruction with the complexities of contemporary professional environments, Dudley-Evans and St John (1998).

Technology offers significant potential to enhance ESP learning by enabling authentic, interactive, and contextually relevant experiences (Chapelle, 2001; Godwin-Jones, 2018). For instance, digital simulations, virtual communication platforms, and multimedia resources can replicate real-world scenarios, allowing learners to engage in tasks that mirror professional practices (Reinders & White, 2016). Such affordances are particularly valuable in ESP contexts, where learners are expected to acquire not only linguistic competence but also pragmatic and communicative competence within specific fields (Belcher, 2006). Moreover, technology facilitates access to up-to-date, domain-specific materials, thereby supporting the dynamic nature of ESP curricula (Anthony, 2018). In this sense, technology can serve as a bridge between classroom learning and real-world application, fostering deeper engagement and more meaningful learning outcomes, Chapelle (2001).

Despite these promising possibilities, the integration of technology in ESP classrooms often remains limited and superficial (Bax, 2011; Mishra & Koehler, 2006). A growing body of research suggests that many educators adopt digital tools primarily for their functional benefits—such as delivering content, managing assignments, or facilitating communication—without fully considering their pedagogical implications (Selwyn, 2016). This tendency reflects a broader issue in educational technology integration, where the focus is placed on the tools themselves rather than on how they can transform teaching and learning processes (Kirkwood & Price, 2014). In ESP contexts, this problem is particularly critical, as the effectiveness of instruction depends heavily on the alignment between pedagogical strategies and learners' specific needs (Hutchinson & Waters, 1987). When technology is used without a clear pedagogical rationale, its potential to support meaningful and context-sensitive learning is significantly diminished, Bax (2011).

This limitation highlights a fundamental gap in the current literature on ESP and technology integration. While numerous studies have explored the use of digital tools in language teaching, many of them adopt a descriptive or evaluative approach, focusing on the effectiveness of specific technologies rather than on the underlying pedagogical principles that guide their use (Chapelle, 2001; Godwin-Jones, 2018). Similarly, research in ESP has traditionally emphasized needs analysis, curriculum design, and genre-based instruction, with relatively limited attention to the role of technology in shaping pedagogical practices (Anthony, 2018). Although recent studies have begun to address digital learning in ESP, they often lack a comprehensive theoretical framework that integrates technological, pedagogical, and content-related considerations (Mishra & Koehler, 2006). As a result, there is still insufficient understanding of how technology can be systematically leveraged to support ESP learning in a pedagogically meaningful way, Anthony (2018).

One theoretical perspective that offers valuable insights into this issue is the concept of affordances. Originating from ecological psychology, affordance theory focuses on the possibilities for action that an environment or object provides to its users (Gibson, 1979). When applied to educational technology, affordances refer to what digital tools enable learners

and teachers to do in specific contexts (Norman, 1988). For example, online platforms may afford opportunities for collaboration, interaction, or access to authentic materials (Conole & Dyke, 2004). By focusing on these possibilities, rather than on the tools themselves, educators can develop a more nuanced understanding of how technology can support learning (Kirschner et al., 2004). However, despite its relevance, the concept of affordances has not been widely or systematically applied in ESP research. Existing studies that address technology affordances tend to be fragmented and lack integration with ESP-specific pedagogical concerns, Conole and Dyke (2004).

In parallel, the Technological Pedagogical Content Knowledge (TPACK) framework has emerged as a widely recognized model for understanding the integration of technology in teaching (Mishra & Koehler, 2006). TPACK emphasizes the interconnectedness of three forms of knowledge: content knowledge, pedagogical knowledge, and technological knowledge (Koehler & Mishra, 2009). This framework provides a useful foundation for designing technology-enhanced instruction, as it highlights the need for alignment between what is taught, how it is taught, and the tools used to facilitate learning (Koehler et al., 2013). In ESP contexts, TPACK can help educators consider how technological tools can support the teaching of specialized content through appropriate pedagogical strategies (Tai, 2015). Nevertheless, while TPACK offers a broad conceptual structure, it does not explicitly address the specific affordances of technology or how these affordances can be leveraged to meet the unique demands of ESP learning. Consequently, there is a need to extend or complement TPACK with a more explicit focus on technology affordances, Mishra and Koehler (2006).

The lack of integration between ESP pedagogy, affordance theory, and TPACK points to a significant theoretical and practical gap. On the one hand, ESP requires context-sensitive and needs-based instructional design (Hutchinson & Waters, 1987); on the other hand, technology offers a wide range of affordances that can support such design (Conole & Dyke, 2004). However, without a coherent framework that connects these elements, educators may struggle to make informed decisions about how to use technology effectively in ESP contexts (Kirkwood & Price, 2014). This challenge is further compounded by the rapid pace of

technological change, which continuously introduces new tools and platforms without necessarily providing clear guidance on their pedagogical use (Selwyn, 2016). As a result, there is a pressing need for a conceptual model that integrates these perspectives and provides a systematic approach to technology-enhanced ESP instruction, Kirkwood and Price (2014).

In response to this gap, the present study seeks to develop a conceptual framework of technology-afforded pedagogy in ESP. Specifically, this study addresses the following research questions: (1) How can technology affordances be conceptualized within the context of ESP pedagogy? and (2) How can these affordances inform the design of effective and context-responsive ESP instruction? These questions are grounded in the assumption that technology should not be viewed as an external addition to pedagogy, but as an integral component that shapes and is shaped by pedagogical practices (Mishra & Koehler, 2006).

To answer these questions, this study adopts a conceptual research design, drawing on a critical review and synthesis of relevant literature. By examining key theories and empirical findings from ESP, affordance theory, and TPACK, this study aims to identify points of convergence and develop an integrative framework that captures the dynamic relationship between technology, pedagogy, and context-specific learning needs (Jabareen, 2009). The proposed framework is intended to move beyond tool-oriented approaches and to emphasize the role of technology as a source of pedagogical affordances that can enhance the quality and relevance of ESP instruction, Jabareen (2009).

This study focuses on examining the relationship between ESP pedagogy, technology integration, and affordance theory in order to provide a more coherent understanding of how technology can support context-specific language learning. While previous research has addressed ESP through needs analysis and curriculum development, and other studies have explored technology integration using general pedagogical frameworks such as TPACK, relatively little attention has been given to how the affordances of technology can directly inform pedagogical practices in ESP contexts (Mishra & Koehler, 2006; Anthony, 2018). Rather than viewing technology simply as a tool for delivering instruction, this study

emphasizes its role in enabling particular forms of learning, such as interaction, collaboration, simulation, and authenticity, which are essential in ESP environments.

The significance of this study lies in its potential to contribute to both theory and practice. From a theoretical perspective, it advances the understanding of technology integration in ESP by introducing a more nuanced and comprehensive framework that incorporates affordance theory (Gibson, 1979). From a practical perspective, it provides guidance for educators and material developers in designing ESP learning experiences that are not only technologically enhanced but also pedagogically meaningful and contextually appropriate (Koehler et al., 2013). Furthermore, by highlighting the role of technology affordances, this study encourages a shift in focus from what technology is to what it enables, thereby fostering more intentional and reflective use of digital tools in ESP education, Koehler et al. (2013).

2) METHODS

This study employed a conceptual research design aimed at developing a theoretical framework of technology-afforded pedagogy in English for Specific Purposes (ESP). Rather than collecting primary data from participants, the study relied on a systematic and critical review of existing literature as the main source of data. Relevant scholarly works were identified through academic databases such as Scopus, Web of Science, and Google Scholar, focusing on publications related to ESP, technology integration, affordance theory, and the Technological Pedagogical Content Knowledge (TPACK) framework.

The selection of literature was guided by several criteria. First, the sources were required to be peer-reviewed journal articles, books, or conference papers to ensure academic credibility. Second, the studies had to be relevant to at least one of the key constructs of this research, namely ESP pedagogy, technological affordances, or technology-enhanced learning. Third, preference was given to recent publications as well as seminal works that have significantly influenced the development of the field. Based on these criteria, a body of literature was compiled and systematically analyzed.

The data analysis was conducted using a qualitative conceptual analysis approach. In this process, key concepts, themes, and theoretical perspectives were identified, compared, and synthesized to explore the relationships among ESP learning needs, technological affordances, and pedagogical practices. The analysis involved several stages, including data familiarization, coding of recurring themes, categorization of concepts, and the integration of findings into a coherent structure. Through this iterative process, patterns and connections across different studies were identified and used as the basis for constructing the proposed framework.

To ensure the rigor of the study, an integrative framework development approach was adopted, allowing for the combination of multiple theoretical perspectives into a unified model. The process of framework development followed established guidelines for conceptual research, including concept identification, relationship mapping, and model refinement. Throughout the analysis, particular attention was given to how technology affordances can function as a mediating element between ESP-specific needs and pedagogical design.

No human participants were involved in this study; therefore, issues related to population, sampling, and research instruments were not applicable. However, the “data” in this study consisted of selected scholarly literature, which functioned as the primary source of evidence for analysis and synthesis. The outcome of this methodological process was the development of a conceptual framework that provides a systematic understanding of technology-afforded pedagogy in ESP contexts.

3) RESULTS

The analysis of the selected literature revealed several recurring themes related to the role of technology in English for Specific Purposes (ESP) pedagogy. These themes were identified through a systematic review and synthesis of studies focusing on ESP, technology integration, affordance theory, and the TPACK framework. The findings indicated that technology was frequently utilized in ESP contexts to support content delivery, communication, and access to learning resources. However, the use of technology was predominantly tool-oriented, with limited emphasis on its pedagogical implications.

Further analysis showed that the concept of technological affordances emerged as a significant element in understanding how technology can support learning. Across the reviewed studies, four major affordances were consistently identified: interaction, collaboration, simulation, and authenticity. Interaction referred to the opportunities for real-time and asynchronous communication between learners and instructors. Collaboration was reflected in the use of digital platforms that enabled group work and knowledge sharing. Simulation involved the use of virtual environments or task-based scenarios that replicated real-world professional contexts. Authenticity was associated with access to real-life materials and communication practices relevant to specific disciplines.

In addition, the findings revealed that ESP pedagogy emphasized the importance of aligning instructional practices with learners' specific needs, professional contexts, and communicative purposes. Needs analysis, task-based learning, and context-driven instruction were identified as central components of ESP teaching. However, these pedagogical principles were often discussed independently of technological considerations in the literature.

The analysis also identified the TPACK framework as a commonly used model for understanding technology integration in education. The framework highlighted the interconnected roles of technological, pedagogical, and content knowledge in instructional design. Nevertheless, the reviewed studies showed that TPACK was generally applied at a broad level and did not explicitly address how specific technological affordances could be operationalized in ESP contexts.

Based on the synthesis of these findings, a set of core components was identified for the development of a conceptual framework of technology-afforded pedagogy in ESP. These components included: (1) ESP learning needs, encompassing target situations and learner characteristics; (2) technological affordances, including interaction, collaboration, simulation, and authenticity; and (3) pedagogical design, incorporating task-based and context-driven instructional strategies. These components were found to be interconnected and collectively contributed to the development of effective ESP learning environments.

4) DISCUSSION

The findings of this study revealed a persistent and significant gap between the widespread use of technology and its pedagogically meaningful integration in English for Specific Purposes (ESP). Although digital tools have become increasingly prevalent in ESP classrooms, their use has largely remained functional, focusing on content delivery, communication, and administrative efficiency rather than on transforming pedagogical practices. This pattern reflects a broader trend in educational technology, where the adoption of tools often precedes a deep understanding of their pedagogical implications (Kirkwood & Price, 2014; Selwyn, 2016). In ESP contexts, this issue becomes particularly critical because effective instruction depends not only on language acquisition but also on the development of context-specific communicative competence. When technology is used without a clear pedagogical foundation, its potential to support authentic, meaningful, and context-responsive learning remains underutilized.

This finding reinforces earlier arguments that technology integration in language education has often been driven by accessibility and innovation rather than by pedagogical necessity (Bax, 2011). In many cases, digital tools are introduced as enhancements to existing teaching practices rather than as catalysts for pedagogical transformation. As a result, the underlying instructional design remains largely unchanged, and technology serves only to replicate traditional teaching methods in digital formats. In ESP, such an approach is insufficient, as it fails to address the complex and dynamic nature of learners' professional communication needs. ESP requires pedagogical approaches that are flexible, adaptive, and closely aligned with real-world contexts, and this alignment cannot be achieved through tool-oriented integration alone.

A central contribution of this study lies in identifying technological affordances as a key conceptual bridge between technology and pedagogy. The analysis revealed four dominant affordances—interaction, collaboration, simulation, and authenticity—that consistently emerged across the literature. These affordances provide a more nuanced way of understanding technology, shifting the focus from what tools are to what they enable learners

and educators to do. This perspective aligns with the foundational principles of affordance theory, which emphasize the relational nature of technology and its users (Gibson, 1979; Norman, 1988). In educational contexts, affordances are not inherent properties of tools but are realized through their use in specific pedagogical situations.

The identification of interaction as a core affordance highlights the importance of communication in ESP learning. Digital technologies enable both synchronous and asynchronous interaction, allowing learners to engage in discussions, negotiations, and feedback exchanges that mirror real-world communication practices. This aligns with socio-constructivist theories of learning, which emphasize the role of interaction in knowledge construction. In ESP, where communication is often situated within specific professional contexts, such opportunities are essential for developing pragmatic competence. The ability to participate in meaningful interaction not only enhances language skills but also prepares learners for the communicative demands of their respective fields.

Similarly, collaboration emerged as a critical affordance that supports group-based learning and knowledge co-construction. Digital platforms such as collaborative writing tools, discussion forums, and project management applications allow learners to work together on tasks that reflect real-world professional activities. This is particularly relevant in ESP contexts, where teamwork and collaborative problem-solving are often integral to professional practice. The affordance of collaboration thus enables the design of tasks that go beyond individual language practice and instead focus on collective meaning-making and task completion.

The affordance of simulation represents another significant finding, particularly in relation to the authenticity of ESP learning. Simulation technologies, including virtual environments and scenario-based tasks, allow learners to engage in realistic situations that replicate workplace contexts. This is especially valuable in ESP, where exposure to real-world environments may be limited or impractical. Through simulation, learners can practice language use in contextually rich and immersive settings, thereby enhancing both their linguistic and professional competencies. This aligns with experiential learning theories, which emphasize the importance of learning through experience and reflection.

Authenticity, as an affordance, further underscores the importance of aligning learning materials and activities with real-world practices. Digital technologies provide access to authentic resources, such as professional documents, videos, and communication platforms, which can be incorporated into ESP instruction. The use of authentic materials not only increases learner engagement but also ensures that instruction remains relevant to the learners' future professional contexts. This finding supports the long-standing emphasis on authenticity in ESP pedagogy (Hutchinson & Waters, 1987), while also highlighting the role of technology in facilitating access to such resources.

Despite the clear relevance of these affordances, the findings indicated that they are not systematically integrated into ESP pedagogical frameworks. Instead, they are often implicitly present or unevenly applied across different instructional contexts. This lack of systematic integration points to a gap in how technology is conceptualized within ESP pedagogy. While ESP research has traditionally focused on needs analysis and curriculum design, it has not sufficiently addressed how technological possibilities can inform pedagogical decisions. This disconnect suggests the need for a more explicit and structured approach to integrating technology into ESP instruction.

In this regard, the TPACK framework provides a useful, though incomplete, foundation. By emphasizing the interplay between technological, pedagogical, and content knowledge, TPACK highlights the importance of integration rather than isolation. However, as the findings of this study suggest, TPACK does not explicitly account for the specific affordances of technology or how these can be operationalized in practice. As a result, educators may understand the importance of integration but still lack concrete guidance on how to implement it effectively in ESP contexts.

The conceptual framework proposed in this study addresses this limitation by incorporating technological affordances as a mediating layer between ESP learning needs and pedagogical design. This addition enhances the explanatory power of TPACK by providing a more detailed account of how technology can support specific pedagogical functions. Rather than treating technology as a general category, the framework breaks it down into actionable

affordances that can be aligned with instructional goals. This approach reflects a shift toward a more design-oriented perspective, where pedagogy is informed by both theoretical principles and practical possibilities.

Another important implication of this study is the emphasis on pedagogical intentionality. The findings suggest that effective technology integration in ESP requires more than technical proficiency; it requires a deliberate and informed approach to instructional design. Educators must consider not only which tools to use but also how and why they are used in relation to learning objectives. This aligns with contemporary views on digital pedagogy, which emphasize the importance of aligning technology use with pedagogical goals and learner needs (Koehler et al., 2013). In ESP, this alignment is particularly important, as it ensures that instruction remains relevant and responsive to the specific contexts in which learners will use the language.

The framework also has implications for material development in ESP. By focusing on technological affordances, material developers can design learning resources that are more interactive, collaborative, and contextually relevant. For example, instead of relying on static texts, materials can incorporate multimedia elements, interactive tasks, and scenario-based activities that reflect real-world practices. This not only enhances learner engagement but also supports the development of higher-order skills, such as problem-solving and critical thinking.

In addition to its theoretical and practical contributions, this study also highlights several limitations. First, as a conceptual study, it did not involve empirical validation of the proposed framework. While the framework is grounded in existing literature, its effectiveness in real-world settings remains to be tested. Second, the study relied on a selected body of literature, which may not fully represent the diversity of research in this field. Although efforts were made to include both seminal and recent works, some relevant studies may have been overlooked. Third, the analysis was limited to specific theoretical perspectives, and other frameworks or approaches may offer additional insights.

These limitations open up several avenues for future research. Empirical studies are needed to test the applicability and effectiveness of the proposed framework in different ESP

contexts, such as higher education, vocational training, and professional development. Such studies could examine how the integration of technological affordances influences learning outcomes, learner engagement, and skill development. Additionally, future research could explore how different technologies embody specific affordances and how these can be matched with appropriate pedagogical strategies.

Another promising direction is the exploration of emerging technologies, such as artificial intelligence, virtual reality, and adaptive learning systems, and their potential affordances in ESP education. These technologies offer new possibilities for personalization, immersion, and real-time feedback, which could further enhance the effectiveness of ESP instruction. Investigating how these affordances can be integrated into pedagogical design would provide valuable insights for both researchers and practitioners.

Finally, future studies could examine the perspectives of teachers and learners regarding technology-afforded pedagogy. Understanding how these stakeholders perceive and experience the integration of technology can provide important feedback for refining the framework and ensuring its practical relevance. Such research would also contribute to a more holistic understanding of technology integration in ESP, taking into account not only theoretical and design considerations but also human factors.

5) CONCLUSION

In conclusion, this study has demonstrated that while technology is widely used in ESP, its pedagogical potential remains underutilized due to a lack of conceptual clarity and integration. By identifying key technological affordances and incorporating them into a unified framework, this study provides a more structured and meaningful approach to technology-enhanced ESP instruction. The findings underscore the importance of moving beyond tool-oriented practices toward a more intentional and design-driven use of technology. As digital technologies continue to evolve, such an approach will be essential for ensuring that ESP education remains relevant, effective, and responsive to the demands of the modern world.

REFERENCES

- Angeli, C., Valanides, N., & Christodoulou, A. (2010). Theoretical considerations of technological pedagogical content knowledge. *Journal of Educational Computing Research*, 42(3), 265–284.
- Bax, S. (2011). Normalisation revisited: The effective use of technology in language education. *International Journal of Computer-Assisted Language Learning and Teaching*, 1(2), 1–15.
- Beatty, K. (2013). *Teaching and researching: Computer-assisted language learning* (2nd ed.). Routledge.
- Belcher, D. (2009). *English for specific purposes in theory and practice*. University of Michigan Press.
- Benson, P. (2011). *Teaching and researching autonomy in language learning* (2nd ed.). Routledge.
- Blin, F., & Munro, M. (2008). Why hasn't technology disrupted academics' teaching practices? *Computers & Education*, 50(2), 475–490.
- Bozkurt, A., & Sharma, R. C. (2020). Emergency remote teaching in a time of global crisis. *Asian Journal of Distance Education*, 15(1), i–vi.
- Chapelle, C. A. (2017). Teaching culture in introductory foreign language textbooks. *TESOL Quarterly*, 51(2), 436–443.
- Chapelle, C. A., & Sauro, S. (2017). *The handbook of technology and second language teaching and learning*. Wiley-Blackwell.
- Conole, G., & Dyke, M. (2004). What are the affordances of information and communication technologies? *ALT-J, Research in Learning Technology*, 12(2), 113–124.
- Dudeney, G., & Hockly, N. (2012). ICT in ELT: How did we get here and where are we going? *ELT Journal*, 66(4), 533–542.
- Ellis, R. (2003). *Task-based language learning and teaching*. Oxford University Press.
- Gibson, J. J. (1979). *The ecological approach to visual perception*. Houghton Mifflin.
- Godwin-Jones, R. (2018). Using mobile technology to develop language skills and cultural understanding. *Language Learning & Technology*, 22(3), 1–17.
- Golonka, E. M., Bowles, A. R., Frank, V. M., Richardson, D. L., & Freynik, S. (2014). Technologies for foreign language learning. *Computer Assisted Language Learning*, 27(1), 70–105.
- Gruba, P., & Hinkelman, D. (2012). *Blending technologies in second language classrooms*. Palgrave Macmillan.
- Hampel, R., & Stickler, U. (2012). The use of videoconferencing in language teaching. *ReCALL*, 24(2), 116–137.
- Hockly, N. (2015). Developments in online language learning. *ELT Journal*, 69(3), 308–313.

- Hsu, L. (2011). Blended learning in ESP courses. *Computer Assisted Language Learning*, 24(4), 323–340.
- Hutchinson, T., & Waters, A. (1987). *English for specific purposes: A learning-centred approach*. Cambridge University Press.
- Kessler, G. (2018). Technology and the future of language teaching. *Foreign Language Annals*, 51(1), 205–218.
- Kirkwood, A., & Price, L. (2014). Technology-enhanced learning and teaching in higher education. *Learning, Media and Technology*, 39(1), 6–36.
- Koehler, M. J., Mishra, P., & Cain, W. (2013). What is technological pedagogical content knowledge (TPACK)? *Journal of Education*, 193(3), 13–19.
- Kukulska-Hulme, A. (2020). Mobile-assisted language learning. In *The Encyclopedia of Applied Linguistics*.
- Laurillard, D. (2012). *Teaching as a design science: Building pedagogical patterns for learning and technology*. Routledge.
- Larsen-Freeman, D., & Anderson, M. (2011). *Techniques and principles in language teaching* (3rd ed.). Oxford University Press.
- Li, L. (2018). Integrating technology in ESP teaching: A review of practices and challenges. *Computer Assisted Language Learning*, 31(5–6), 456–478.
- Long, M. H. (2005). *Second language needs analysis*. Cambridge University Press.
- Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017–1054.
- Motteram, G. (Ed.). (2013). *Innovations in learning technologies for English language teaching*. British Council.
- Norman, D. A. (1988). *The psychology of everyday things*. Basic Books.
- Nunan, D. (2004). *Task-based language teaching*. Cambridge University Press.
- O'Dowd, R. (2018). From telecollaboration to virtual exchange: State-of-the-art and the role of UNICollaboration. *Language Teaching*, 51(4), 477–490.
- Reinders, H., & White, C. (2016). 20 years of autonomy and technology. *Language Learning & Technology*, 20(2), 143–154.
- Richards, J. C. (2015). *Key issues in language teaching*. Cambridge University Press.
- Selwyn, N. (2016). *Education and technology: Key issues and debates* (2nd ed.). Bloomsbury Academic.
- Stockwell, G. (2013). Technology and motivation in English-language teaching and learning. *Language Learning & Technology*, 17(3), 1–10.
- Stockwell, G., & Hubbard, P. (2013). *Some emerging principles for mobile-assisted language learning*. The International Research Foundation for English Language Education.

- Tai, T. Y., Chen, H. H. J., & Todd, G. (2021). The impact of artificial intelligence on language learning. *Computer Assisted Language Learning*.
- Thomas, M., Reinders, H., & Warschauer, M. (2013). *Contemporary computer-assisted language learning*. Bloomsbury.
- Tomlinson, B. (2016). *Materials development for language learning and teaching*. Cambridge University Press.
- Walker, A., Voce, J., & Ahmed, J. (2016). *Survey of technology enhanced learning for higher education*. JISC Report.
- Warschauer, M., & Kern, R. (2000). *Network-based language teaching: Concepts and practice*. Cambridge University Press.
- Widdowson, H. G. (1998). Context, community, and authentic language. *TESOL Quarterly*, 32(4), 705–716.
- Yanguas, Í. (2020). Oral computer-mediated interaction. *Language Learning & Technology*, 24(1), 1–17.