MBNA Publishing House Constanta 2026



Proceedings of the International Scientific Conference SEA-CONF

SEA-CONF PAPER • OPEN ACCESS

Rethinking Teacher Education: The Importance of Integrating the TPACK Framework in Teaching Maritime English

To cite this article: Sandiuc Corina, Proceedings of the International Scientific Conference SEA-CONF 2026, pg. 39-43.

Available online at www.anmb.ro

ISSN: 2457-144X; ISSN-L: 2457-144X

doi: 10.21279/2457-144X-26-005
SEA-CONF© 2025. This work is licensed under the CC BY-NC-SA 4.0 License

Rethinking Teacher Education: The Importance of Integrating the TPACK Framework in Teaching Maritime English

Sandiuc Corina

Mircea cel Batran Naval Academy, Faculty of Navigation and Naval Management,
corina.sandiuc@anmb.ro

Abstract. The rapid transition to online and blended education in recent years has highlighted the necessity for language teachers to move beyond basic computer literacy and embrace a specialized framework for digital pedagogy. The Technological Pedagogical Content Knowledge (TPACK) framework has become a central model for understanding effective teaching in digital and blended learning environments. The present paper explores the ways in which TPACK can be applied to Maritime English instruction, based on descriptive accounts and theoretical analyses from recent literature. The findings suggest that TPACK serves as the integrated foundation for successful digital instruction. It involves a sophisticated understanding of how to represent specific concepts using digital tools and implementing technological strategies that actively and constructively enhance the teaching of specific content. In highly specialized contexts such as maritime education, this expertise enables Maritime English teachers not only to align domain-specific content with communicative practices, but also to identify students' strengths and challenges and to use technology to build on prior knowledge and support new learning.

Keywords: TPACK framework, digital tools, online teaching/learning, professional development

1. Introduction

The COVID-19 pandemic served as a global catalyst for the "forced" migration of face-to-face instruction to online platforms. For language educators, this transition was particularly challenging, as the competencies required for effective online teaching differ significantly from those used in traditional physical classrooms. Research indicates that teachers who have not received professional training often attempt to teach online courses in the same way they deliver face-to-face lectures, ignoring the pedagogical differences inherent in the digital environment. (Zou et al., 2021) This frequently leads to lower student satisfaction and reduced teaching effectiveness.

In the field of English for Specific Purposes (ESP), where the focus is on professional domains such as medicine, law, or maritime studies, the stakes are even higher. (Voogt et al., 2013) Maritime English, governed by international safety standards (such as those of the International Maritime Organization), requires learners to master highly technical vocabulary and standardized communication protocols to ensure safety at sea. To meet these demands in a digital environment, teachers must possess a sophisticated understanding of how technology can facilitate the acquisition of specialized content - a capacity defined by the TPACK framework.

The TPACK framework, developed by Mishra and Koehler, proposes that effective teaching with technology depends on the integration of three core types of knowledge: Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK). Content Knowledge refers to the

teacher's understanding of the subject matter itself, Pedagogical Knowledge involves the principles and methods of teaching and learning, and Technological Knowledge encompasses both the practical ability to use digital tools and the insight to judge when and how these tools support learning objectives. Importantly, TPACK is not simply the sum of these parts but an integrated form of professional knowledge, where technology, pedagogy, and content are carefully aligned and interact dynamically within a specific educational context. (Mishra & Koehler, 2006; Koehler et al., 2013; Voogt et al., 2013)

As Mishra and Koehler (2009) emphasize: "*TPACK is different from knowledge of all three concepts individually. Instead, TPACK is the basis of effective teaching with technology, requiring an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge to develop new epistemologies or strengthen old ones.*" In practice, this means that effective teaching emerges when these knowledge domains are meaningfully aligned. For example, in Maritime English teaching, Content Knowledge involves the specialized terminology and communication used in maritime environments (e.g., navigation, onboard ship operations, port and harbor activities, ship-to-ship and ship-to-shore communication, cargo handling, engine-room operations, etc.), Pedagogical Knowledge includes strategies such as scaffolding and task-based learning to support language acquisition, and Technological Knowledge involves the effective use of digital platforms and online multimedia resources. The ideal balance of the TPACK framework is reached when a teacher is able to deliberately select and integrate technology in ways that directly enhance pedagogical strategies and support the learning of specific content.

2. Technology acceptance and teaching effectiveness

The Technology Acceptance Model (TAM) often complements TPACK in the sense that Perceived Ease of Use (the belief that using a technology is effortless) and Perceived Usefulness (the belief that it facilitates job performance) are the primary indicators of whether a user will accept a computer technology. Specifically, when users find a technology both easy to use and useful, they develop an optimistic attitude toward that technology, which in turn fosters a positive intention to integrate it into their work. (Teo & Noyes, 2011; Zou et al. 2021; Çeşme & Akdağ Çimen, 2026)

This relationship has also been confirmed by recent studies on online EFL teaching, where teachers' perceptions that a system is simple to operate are positively associated with their judgments of its effectiveness, reflecting core assumptions of the Technology Acceptance Model. (Çeşme & Akdağ Çimen, 2026) This perspective complements TPACK research, which similarly suggests a significant positive correlation between teachers' command of technological pedagogical content knowledge and their perceptions of online teaching effectiveness. In this sense, teachers' confidence in using accessible, useful technologies aligns with their broader ability to adapt to technological developments and to determine when technology supports learning objectives.

Furthermore, technology contributes to both greater learning efficiency and expanded interaction, reinforcing the idea that digital tools are most valuable when they enhance pedagogy rather than merely deliver content. Learning efficiency is reflected in the way digital tools support faster learner progress through immediate feedback, flexible access to materials, and opportunities for repeated practice, aligning with the view that technology should improve the effectiveness of learning processes. At the same time, expanded interaction is evident in the increased opportunities for teacher-student and peer communication facilitated by online tools, which can otherwise be difficult to achieve in remote learning environments. Together, these aspects highlight how technology supports both the pace and the quality of learning through meaningful pedagogical integration (Hubbard, 2019 as cited in Zou et al., 2021).

3. Importance of TPACK in teaching Maritime English

One of the key contributions of the TPACK framework in Maritime English teaching lies in its capacity to support authentic, scenario-based communication in online environments. Maritime communication is inherently real-time, operational, and safety-critical, involving standardized and structured exchanges in maritime scenarios such as: ship-to-ship and ship-to-shore communication, onboard bridge communication, pilot-master exchanges, communication with port authorities and so on. In this context, contemporary digital pedagogy increasingly moves beyond general-purpose communication tools toward integrated, simulation-driven learning environments that replicate professional maritime discourse with greater fidelity.

While synchronous and asynchronous tools such as video-conferencing systems and voice messaging applications (e.g., Zoom, Microsoft Teams, Google Meet, WhatsApp, etc.) remain useful for facilitating basic communicative practice, they are now considered foundational rather than innovative instruments. Current developments in Maritime English instruction place greater emphasis on digital task-based learning environments that combine communication, assessment, and feedback within professionally oriented scenarios. In this regard, learning management systems such as Moodle and Canvas represent a more advanced pedagogical environment, as they enable teachers to design structured courses, embed interactive maritime communication tasks, organize scenario-based activities, and integrate continuous assessment within a unified digital space. More recent developments in digital language education also include the use of AI-powered chatbots, which provide learners with additional opportunities for autonomous practice through simulated dialogue, immediate feedback, and role-play scenarios. In Maritime English instruction, such tools can support vocabulary reinforcement and communication rehearsal outside the classroom, complementing structured learning environments within learning management systems and synchronous platforms. AI-powered chatbots represent an emerging technological resource within the TPACK framework, supporting Maritime English learning by enabling interactive dialogue practice, immediate feedback, and scenario-based communication rehearsal; however, their effectiveness depends on pedagogically informed integration rather than autonomous use.

Focusing specifically on learning management systems rather than other digital tools, these resources extend the pedagogical possibilities of the TPACK framework by integrating content knowledge, pedagogy, and technology into coherent task-based learning design. They allow teachers to move beyond isolated communicative exercises toward performance-oriented learning sequences, where students receive immediate feedback and engage in progressively complex maritime scenarios.

Through features such as forums, quizzes, assignment submissions, and multimedia tools, these platforms support both interaction and assessment in a structured and traceable learning environment. One important application is collaborative learning, which reflects the teamwork-oriented nature of maritime operations. These systems facilitate group assignments through shared documents, peer review tasks, and discussion boards. Students can collaboratively analyze communication breakdowns, or evaluate case studies of maritime incidents, thereby developing both linguistic and professional competencies. In terms of assessment and feedback, these platforms offer integrated tools for formative and summative evaluation. Teachers can design quizzes targeting maritime terminology, comprehension of SMCP structures, and scenario-based tasks. Automated feedback mechanisms, particularly in quiz-based activities, allow students to immediately identify errors and reinforce correct language use. Additionally, assignment feedback tools enable teachers to provide correction on written reports, supporting continuous language development.

Another important function of these platforms in Maritime English teaching is course structuring and content sequencing. Teachers can organize learning materials into thematic modules, which allows for gradual progression from basic vocabulary acquisition to more complex communicative tasks, ensuring alignment between pedagogical scaffolding and content difficulty.

Finally, these online platforms contribute to learning continuity and progress tracking, particularly important in maritime education where learners may be geographically dispersed or engaged in blended training. They allow teachers to monitor student participation, identify learning gaps, and

adapt instruction accordingly. This ongoing monitoring aligns with TPACK principles, as it supports the dynamic adjustment of pedagogy based on learner needs and technological accessibility.

The implications for teachers are obvious: they need to continuously update their technological competence alongside their pedagogical and content expertise. Digital tools used in language education are evolving quickly, from learning management systems and video-conferencing platforms to more recent developments such as AI-powered chatbots and adaptive learning environments. In this context, technological knowledge cannot remain static; it requires ongoing familiarisation with new tools and an informed understanding of how these tools can meaningfully support learning objectives rather than simply replace traditional practices. For Maritime English teachers, this is particularly relevant because training must remain aligned with professional communication standards while also reflecting current digital practices used in education and industry. Continuous professional development, experimentation with new platforms, and reflective practice therefore become essential components of effective teaching. Within a TPACK perspective, this ongoing adaptation ensures that teachers are not only users of technology, but informed designers of learning experiences that integrate technology purposefully with appropriate pedagogical strategies.

4. Conclusions

Overall, learning management platforms function as more than content delivery systems; within a TPACK framework, they operate as integrated pedagogical environments that support structured learning, authentic communication practice, continuous assessment, and collaborative skill development in Maritime English instruction. This integrated role highlights the necessity of moving beyond basic technological adoption toward a more informed and purposeful alignment of content, pedagogy, and digital tools.

The findings of recent studies suggest that the TPACK framework offers a robust foundation for rethinking teacher education in Maritime English, especially in increasingly digital and blended learning environments. The effective use of technology enables teachers to recreate authentic professional scenarios, guide learners through more complex communicative tasks, and provide timely feedback that supports continuous improvement. At the same time, pedagogically sound design ensures that technology is not used in isolation but embedded meaningfully within learning objectives and professional requirements.

Therefore, strengthening TPACK-based competencies through continuous professional development should be considered a priority for maritime education institutions. Only by mastering the intersection of technology, pedagogy, and technical content can Maritime English teachers ensure that the next generation of seafarers possesses the communication skills necessary for safe and efficient global operations.

References

1. Çeşme, H., & Akdağ Çimen, B. (2026). *EFL Teachers' Technology Readiness and Intention to Use Online Education: The Mediating Role of TAM*. Sage Open, 16(1). Available: https://journals.sagepub.com/doi/10.1177/21582440251410825
2. Koehler, M. & Mishra, P. (2009). *What is Technological Pedagogical Content Knowledge (TPACK)?*. Contemporary Issues in Technology and Teacher Education, 9(1), pp. 60-70. Available: https://www.learntechlib.org/primary/p/29544/
3. Koehler, M. J., Mishra, P., & Cain, W. (2013). *What is technological pedagogical content knowledge (TPACK)?* Journal of Education, 193(3), pp. 13–19. Available: https://doi.org/10.1177/002205741319300303
4. Mishra, P., & Koehler, M. J. (2006). *Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge*, Teachers College Record, 108(6), pp. 1017–1054. Available: https://doi.org/10.1111/j.1467-9620.2006.00684.x

5. Teo, T. & Noyes, J. (2011). *An assessment of the influence of perceived enjoyment and attitude on the intention to use technology among pre-service teachers: A structural equation modeling approach*. Computers & Education, 57(2), pp. 1645–1653. Available: https://doi.org/10.1016/j.compedu.2011.03.002
6. Voogt, J., Fisser, P., Pareja Roblin, N., Tondeur, J., & van Braak, J. (2013). *Technological pedagogical content knowledge: A review of the literature*. Journal of Computer Assisted Learning, 29(2), pp. 109–121. Available: https://doi.org/10.1111/j.1365-2729.2012.00487.x
7. Zou, B., Huang, L., Ma, W., & Qiu, Y. (2021). *Evaluation of the effectiveness of EFL online teaching during the COVID-19 pandemic*. SAGE Open, 11(4), pp. 1–17. Available: https://doi.org/10.1177/21582440211054491