WHIOCE PUBLISHING PTE. LTD.
PROVIDING
FIRST-CLASS SCIENTIFIC INFORMATION
FOR TOP SCHOLARS

2025 Volume 3, Issue 11
Lecture Notes in Education, Arts, Management and Social Science
ISSN(Online): 2705-053X

Research on the Development of TPACK (Integrated Technology in Subject Teaching Knowledge) of Maritime English Teachers from the Perspective of Digital Literacy

Juan Liu
Hainan Vocational University of Science and Technology, Haikou 571126, Hainan, China

Abstract: With the wide push of educational digitalization and digital shift of the global shipping industry, maritime English serves as a key vocational course for maritime majors in colleges and universities. The quality of this course directly shapes the international professional ability of shipping talents. At present, many college maritime English teachers face such troubles: their digital literacy fails to match the integration of TPACK, and technology use does not fit well with subject teaching. Such problems have slowed down the progress and upgrading of digital teaching for maritime English. Starting from the core theories including TPACK and AI-TPACK, this study makes clear the internal link between teachers' digital literacy and TPACK, looks into the current situation of teachers' development, and builds a feasible TPACK growth path for maritime English teaching. This study tries to make up for the shortage of digital literacy among maritime English teachers, push the close integration of technical knowledge, subject content and teaching methods, offer theoretical reference and practical help for the training of maritime teachers and digital teaching reform in colleges, and assist the cultivation of high-level shipping talents.

Keywords: Digital literacy; Maritime English teachers; TPACK; Digital teaching

Online publication: December 1, 2025

1. Introduction

Digital transformation has long been a key focus of higher education reform. With the deep integration of artificial intelligence, big data and other technologies into foreign language teaching, fresh demands are put forward for the professional ability of college English teachers. Maritime English integrates professional, practical and vocational attributes, and it needs to keep pace with the digital standards of the International Maritime Organization as well as the actual work demands of shipping posts. Teachers' TPACK competence is a crucial factor that affects the actual teaching effect. At present, college maritime English teachers generally have insufficient digital literacy, and the integration of technology and professional teaching stays on the surface. Such problems make it hard to meet the demand for cultivating shipping talents in the new era. This paper sorts out the core theoretical connotation, studies the bottlenecks existing in teachers' professional development, and puts forward targeted improvement strategies, so as to offer practical references for the digital reform of maritime English teaching.

2. Core Concept Definition and Theoretical Coupling Relationship

2.1. Core Connotation of Digital Literacy

Digital literacy is a key professional quality that college teachers need to have in the digital era. It covers a variety of aspects, including the use of digital tools, teaching design with digital methods, making digital teaching resources, following digital ethics, and analyzing teaching data through statistics. It is the basic capability that helps teachers adapt to digital teaching and carry out teaching research with information technology [1]. Considering the special professional features of maritime English teaching in colleges, teachers' digital literacy involves the basic operation of common digital teaching tools for foreign language classes, and also includes professional skills like screening maritime-related digital materials, designing maritime English digital courseware, using AI to assist professional English teaching, and carrying out digital classroom evaluation. This is the vital link that connects technical application with maritime English subject teaching. Current teaching studies have shown that the training of college English teachers' digital literacy has to fit the inherent traits of the subject, and we need to avoid splitting technical application from teaching content. Besides improving practical operation skills, the renewal of teaching ideas should also be promoted at the same time[1].

2.2. Analysis of the TPACK Framework for Maritime English Teachers

TPACK refers to integrated technology-based subject teaching knowledge. It consists of three core dimensions: subject content knowledge, teaching method knowledge, and technology knowledge. Additionally, it includes four composite aspects formed by the intersection and integration of these three elements: subject teaching method knowledge, technology content knowledge, technology teaching method knowledge, and integrated technology-based subject teaching knowledge. This framework is the core measure for evaluating teachers' digital teaching capabilities. Maritime English, with its strong professional attributes, has subject content knowledge that always focuses on core points such as maritime terms, maritime conventions, shipping business, and ship communication. The appropriate teaching methods tailored to the learning situation have established the teaching rules for professional English. Situational teaching, practical operation exercises, and job simulation are all suitable teaching methods. When it comes to the technical knowledge, it must be adapted to the actual needs of maritime teaching. Maritime language corpora, AI oral training, and digital simulation platforms are all suitable specialized technologies. By reviewing the existing academic achievements, it can be seen that relying on the TPACK-V framework and the AI-TPACK framework, the knowledge framework of professional English teachers has been gradually strengthened, and the underlying theoretical foundation for the research on TPACK for maritime English teachers has been further solidified[2].

2.3. Coupling Relationship between Digital Literacy and TPACK of Maritime English Teachers

Digital literacy is the basic premise for college maritime English teachers to improve their TPACK level. And TPACK is the specific reflection of digital literacy applied in subject teaching. The two complement each other and rely on each other in teaching practice. Good digital literacy allows teachers to master digital teaching tools skillfully, get rid of the limits of time and space in traditional maritime English teaching, combine technology with subject content and teaching methods smoothly, and perfect the TPACK knowledge system. On the other hand, the continuous improvement of the TPACK framework can also push teachers to polish their digital practical skills and resource integration ability, preventing digital technology from being used superficially or just for show. Only by deeply integrating the two can we bring new changes to maritime English digital teaching, keep up with the digital transformation pace of the shipping industry, which is also a necessary way for the professional growth of college maritime English teachers.

3. Realistic Challenges in the Development of TPACK for College Maritime English Teachers from the Perspective of Digital Literacy

3.1. Weak digital technology literacy, insufficient support from the TK dimension

College maritime English teachers who deeply study the core of the English subject and maritime profession have very

few opportunities for systematic and digitalized training. They are not proficient in general digital technology operations, and their application skills for specialized maritime digital tools are also relatively weak. Apart from simple operations such as creating basic courseware and playing teaching videos, they are unable to master a variety of professional digital tools like AI teaching platforms, maritime English corpus, and ship simulation communication systems. The existing technical accumulation is fundamentally insufficient to support the establishment of the TPACK framework. In addition, the teaching staff still lacks the ability to develop, integrate, and improve digital teaching resources, making it difficult to customize and tailor resources that fit the professional characteristics of maritime English. The technical dimension ultimately cannot effectively connect with the subject content and teaching methods[3].

3.2. The integration of subject knowledge and technology is incomplete, and the TCK dimension has poor adaptability.

Maritime English has strong professional attributes and tight job relevance, covering key teaching contents like shipping freight, ship operation, maritime emergencies and international conventions. But most teachers split digital technology and professional content completely in class. Even when dealing with those obscure and uncommon maritime terms, they never use digital tools to break them down and explain clearly. Real shipping communication scenes can't be rebuilt in class. All kinds of digital tools only stay as a superficial teaching aid, and fail to integrate deeply with the core knowledge of maritime English. Besides, teachers are still short of the ability to pick and sort out digital resources for maritime fields. Classroom content is out of line with the actual work needs of frontline shipping posts, and the matching degree between technology and professional content is far from enough. Because of this, the TPACK framework can't be really put into practice.

3.3. The integration of teaching methods and technologies is superficial, with weak practical effectiveness in the TPK dimension.

Traditional maritime English teaching has long been stuck in one-way knowledge input, paired with repeated reading and rote memorization, focusing too much on rote theoretical learning and totally ignoring hands-on practical training. Even if some teachers have brought digital tools into the classroom, their fixed teaching mindset hasn't shifted, the teaching process hasn't been improved, and teaching methods haven't been updated at all. The integration of digital technology and teaching design only stays on the surface. What's more, the building of practical, immersive digital situational classrooms has never been put into real action. Besides, teachers can't carry out targeted teaching and personalized training based on the professional features of maritime English. The use of digital teaching methods is just perfunctory, and the core skills that students need for future jobs can't be fully cultivated.

3.4. The teaching and research support system is incomplete, and a long-term development mechanism is lacking.

The specialized training provided by universities for maritime English teachers mostly focuses on professional knowledge and teaching skills. However, systematic training that meets the digital literacy and TPACK integration requirements of the discipline is extremely scarce. The training content is not in line with the actual needs, and it is difficult to adapt to the professional characteristics of maritime English. The cross-disciplinary teaching and research within the school and the collaborative teaching and research with enterprises have mostly become mere formalities. Even the communication with information technology teachers and senior experts in the shipping industry is rarely conducted smoothly. The cutting-edge digital teaching concepts and industry practical skills are also inaccessible. More importantly, the TPACK development assessment system suitable for maritime English teaching has not yet been perfected. It is impossible to accurately identify the weaknesses of teachers' abilities, and a closed-loop, long-term improvement mechanism has thus been unable to be established.

4. Development Strategies for TPACK of Maritime English Teachers from the Perspective of Digital Literacy

4.1. Strengthen the foundation of digital literacy and lay a solid support for the development of TPACK

This strategy is based on the layered cultivation theory of digital literacy, closely aligning with the professional requirements of maritime English teaching. It constructs a dual-layer cultivation system of "basic digital skills + professional digital capabilities", focusing on the improvement of teachers' technical knowledge, filling the gaps in digital literacy, and laying a solid foundation for the establishment of the TPACK framework [2]. Reviewing the existing achievements in cultivating English teachers' digital literacy, in line with the unique professional characteristics of maritime English, refine and polish the training content, focus on the core competencies of digital practice, resource integration, teaching method innovation, and professional ethics observance, inspire teachers to update their teaching concepts, cultivate a digital teaching awareness, and precisely connect technical knowledge with subject teaching [3]. Universities can take the lead in coordinating and organizing maritime English teachers to participate in training and study, specializing in the practical operation of AI foreign language teaching tools, maritime English corpus, and ship communication simulation platforms, leading teachers to master skills such as basic digital courseware development, online question bank construction, cloud-based oral assessment, etc., and skillfully use digital tools to organize core knowledge points such as maritime professional terms and maritime conventions. For students, they can thoroughly understand the usage of standardized maritime English terms, independently study and practice with various digital tools, gradually acquire the ability to independently explore, cultivate digital learning literacy, and consolidate the professional theoretical foundation of maritime English.

4.2. Deepen professional subject knowledge and anchor the core of TPACK integration

This strategy hinges on the core role of subject content knowledge in the TPACK framework, paired with demands for cultivating digital literacy, and pushes teachers to dig deep into the core connotation of maritime English. Meanwhile, it pulls in digital resources across the shipping industry, realizing tight integration of technical knowledge and subject-specific content, and refining the technical content knowledge system . Grounded in framework theories like AI-TPACK and TPACK-V, it guides teachers to keep teaching in line with real hiring needs of the shipping industry. Only by weaving digital technology into the teaching of key maritime English knowledge can we bridge the gap between technology and the subject, and fully bring out the professional nature of the course. Dig deep into maritime digital resource banks, sort out core contents including shipping business, ship emergency handling and document processing, then use AI tools to sort out tricky professional points and make digital courseware that fits actual job needs. Those dull and hard-to-grasp theoretical contents will turn clear and straightforward. For students, it becomes much easier to master professional knowledge. Getting familiar with digital workflows of shipping posts helps them sharpen practical and adaptive skills, laying a firm groundwork for career growth at the start of study.

4.3. Optimize the technology integration teaching method and break through the practical path of TPACK

This strategy draws on the integrated theory of subject teaching knowledge and technological teaching knowledge, and fits the teaching rules of maritime English vocational education. It gives up the old and single teaching mode, and tries to refresh teaching methods with digital technology. It builds a digital teaching mode that is situational, immersive and practical, so as to improve the composite dimension system of TPACK. Looking at the practical attempts of digital teaching in college English, we can easily find that practicality is the core trait of maritime English. Task-driven learning, situational practice and on-site simulation can all be deeply integrated with digital technology. This is not a shallow mix, but a real implementation that can bring tangible effects. As a practical tool for teaching, the ship simulation communication system can build simulated onboard operation scenes, covering ship talks, maritime communication, emergency communication and other links. These practical tasks are set step by step, and with AI's real-time correction on oral expression and professional terms, personalized

one-to-one guidance can be well carried out. Practical training in such real workplace scenes helps students not only grasp standard maritime English expressions, but also improve their emergency handling ability, on-site operation skills, professional core literacy and digital application ability, and these abilities will take shape little by little.

4.4. Establish a collaborative teaching and research system and improve the long-term cultivation mechanism of TPACK

This strategy draws on teacher collaborative development theory, and sets up a three-dimensional teaching and research system covering interdisciplinary research inside colleges, school-enterprise joint teaching and online-offline training. It integrates training, practice and assessment into a complete mechanism, offering solid institutional support for the growth of maritime English teachers' TPACK capacity . Taking example by the practical ways of upgrading college English teachers' digital literacy, schools can optimize the teaching assessment rules, and make detailed assessment indexes for the deep integration of digital literacy and TPACK. In routine teaching and research exchanges, this helps teachers refresh their teaching ideas and consolidate the integration foundation, gradually lifting their overall TPACK level. With colleges as the leading party, joint research can be carried out among maritime English teachers, information technology teachers and maritime major teachers. Schools can also work with shipping companies to hold joint training sessions, bring in advanced digital teaching methods from the industry, and hold regular TPACK skill contests and digital lesson planning sharing activities. In this way, students can also get access to high-quality teaching resources and latest modes from frontline industries, expand their professional vision, and improve their post adaptability, innovative thinking and independent learning ability, which fully meets the talent cultivation standards for maritime majors in the new era.

5. Summary

The deep integration of digital literacy and TPACK is an unavoidable trend for the professional development of college maritime English teachers. It is also a vital way to promote the digital reform of maritime English teaching and cultivate high-quality shipping talents. At present, college maritime English teachers still have many shortcomings in digital literacy and the integration of technology and subject teaching. To fix these problems, we need to take four key measures: building a solid base of digital literacy, further exploring professional subject knowledge, improving teaching methods combined with technology, and setting up a collaborative teaching and research system. These measures can help make up for the gaps in teachers' professional abilities and perfect the TPACK knowledge system. In the future, colleges should keep pace with the digital transformation needs of the shipping industry, optimize the teacher training mechanism, and help teachers improve their digital literacy and TPACK level at the same time. This will further lift the quality and efficiency of maritime English teaching, and provide more competent talents for the international shipping industry.

References

[1] Zhao FJ, Wu JY, Li YJ, et al., 2025, Research on Higher Vocational English Teaching Based on the Framework of AI Fusion TPACK-V. Journal of Tongling Vocational and Technical College, 24(04): 14-19.

[2] Hu YQ, 2025, Research on the Current Situation and Improvement Path of Digital Literacy of Vocational College English Teachers from the Perspective of TPACK. Journal of Hubei Open Vocational College, 38(09): 155-158+162.

[3] Feng H, Ge M, 2025, Exploration of the Path for Enhancing Digital Literacy of Higher Vocational English Teachers from the Perspective of TPACK. English Square, (08): 112-115.