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**DIGITAL FRAMEWORK FOR DEVELOPING THE SOCIOLINGUISTIC
COMPETENCE OF FUTURE NAVIGATORS WITHIN MARITIME
ENGLISH 4.0**

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The digital transformation of the maritime industry and the rapid development of the Smart Shipping concept are reshaping the nature of professional communication on the modern navigational bridge. Today, interaction among future navigators occurs not only within multinational crews but also through digital interfaces, automated navigation systems, and intelligent decision-support modules. Under these conditions, the importance of sociolinguistic competence increases significantly, as it ensures the ability to select appropriate linguistic means according to professional roles, status relations, operational contexts, and intercultural factors. The degree to which this competence is developed directly affects the accuracy of radiocommunication, the effectiveness of teamwork, and overall maritime safety.

The requirements of the STCW Convention and IMO Model Courses emphasize the need to develop situational awareness, sociolinguistic sensitivity, and the ability to make responsible communicative decisions in high-risk and multicultural professional environments [1]. These international standards position the sociolinguistic dimension of communication as a key component of the professional readiness of future deck officers.

Within the framework of Maritime English 4.0, sociolinguistic competence acquires an expanded meaning, encompassing the ability to interpret signals produced by intelligent algorithms, adapt communicative actions to dynamic navigational conditions, and maintain coherence in team operations when interacting with digital technologies.

Sociolinguistic competence of a navigator is defined as the ability to use linguistic means appropriately, depending on the professional situation, the roles of communicative participants, the cultural context, and operational requirements. In multinational crews, this competence plays a crucial role, as sociolinguistic inaccuracies may lead to misinterpretation, delayed reactions, and an overall increase in operational risk.

International maritime training standards – the STCW Convention and IMO Model Courses 3.17 and 3.12 – require comprehensive modelling of professional communicative situations in which a future officer must demonstrate the ability to make accurate communicative decisions, maintain clarity of messages, and ensure effective coordination in crisis and non-standard scenarios [2].

Accordingly, traditional training methods (role-plays, case analyses, situational dialogues) require enhancement through simulation-based technologies that create realistic conditions for reproducing the sociolinguistic parameters of professional maritime communication. *Imersive XR technologies provide an effect of presence and make it possible to model multifactor scenarios of interaction: status-role relations on the bridge, intercultural features of communicative behaviour, professional contexts and risk levels, regulated SMCP terminology, communication in the human-machine interaction format.*

Based on the analysis of surveys conducted among instructors and cadets of Kherson State Maritime Academy, as well as the generalisation of pedagogical experience, a comprehensive vision of a digital framework for developing the sociolinguistic competence of future navigators was formulated. The findings demonstrate that combining traditional instructional methods with XR and AI

technologies creates a learning environment in which linguistic, sociocultural and technological components of professional communication are effectively integrated.

Further analysis made it possible to outline the key sociolinguistic parameters of digital maritime communication, including status–role relations on the bridge, intercultural factors, features of interface interaction, and operational situationality.

An important outcome of the study is the identification of the influence of XR and AI tools on the dynamics of professional communicative skills formation. These technologies enhance communicative reactivity, improve the accuracy of communicative decisions, and broaden cadets' situational awareness. Working with immersive scenarios contributes to more flexible adaptation to changing navigational contexts and increases readiness for action under stress.

Moreover, the study systematised the pedagogical conditions necessary for the effective implementation of the proposed digital framework. These include the integration of XR simulations into the content of professional disciplines, support for individual learning trajectories through AI-based tools [3], the combination of digital and traditional methods, and the use of automated language systems for formative assessment [4].

The obtained results allow the proposed framework to be viewed as a promising instrument for modernising the professional training of future navigators. It can be adapted both in core educational programmes and in continuing professional development courses aimed at preparing officers to operate within Smart Navigation environments and digital bridge technologies.

Conclusions. The study demonstrates that the digital transformation of maritime operations requires renewed approaches to developing the sociolinguistic competence of future navigators within Maritime English 4.0. As automated and intelligent systems become integral to bridge operations, XR technologies, AI-assisted tools, and scenario-based modelling provide training environments that realistically replicate operational contexts and enhance communicative accuracy, situational awareness, and reliable decision-making.

The findings show that effective sociolinguistic preparation depends on the capacity of the learning environment to model status–role dynamics, intercultural factors, pragmatic constraints, and operational conditions typical of maritime communication. Immersive XR simulations and intelligent language systems allow cadets to practise communicative strategies in multifactor and time-sensitive situations, strengthening their adaptability and communicative flexibility.

Cadets trained with these technologies display more context-appropriate linguistic behaviour, improved role awareness, and enhanced team coordination, which reduces the likelihood of miscommunication in multinational crews. The proposed digital framework modernises Maritime English training by combining traditional pedagogy with advanced technological tools, supporting alignment with the STCW Convention and IMO Model Courses and reinforcing maritime safety.

Overall, the study confirms the pedagogical relevance of XR- and AI-supported approaches in shaping sociolinguistic competence and highlights their potential for creating adaptive, profession-oriented learning solutions. Future research should refine assessment methods for sociolinguistic performance in digital environments and advance interdisciplinary training models aligned with Smart Shipping and smart-bridge technologies.


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YOUTUBE RESOURCES TO ENHANCE ORAL COMPREHENSION IN MARITIME ENGLISH OF FUTURE NAVIGATORS

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Quite many researches prove that YouTube is an interactive and highly effective resource for teaching foreign and professional languages, in particular Maritime English, by providing authentic, engaging learning experiences and thus enhancing engagement, language skills, and learner autonomy, etc. YouTube resources can be effective tools for intensifying oral comprehension of future navigators, especially when carefully selected and integrated into Maritime English education.

The aim of the article is to study key points of the YouTube resources usage to enhance oral comprehension in Maritime English of future navigators.

Our research highlights both the benefits and challenges of using YouTube in formal curricula, emphasizing the need for careful selection and alignment with educational goals. Some key benefits of YouTube are:

skill development: supports improvement in speaking, listening, pronunciation, fluency, vocabulary, grammar, and even writing skills. It is especially effective for speaking and listening, with studies showing significant gains in fluency, coherence, and pronunciation when compared to traditional methods [1, 2, 3];