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MARINE ENGINEER TRAINING IN PROFESSIONAL FOREIGN LANGUAGE COMMUNICATION WITH COMPUTER SUPPORT

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Abstract

The article deals with the significance of the process of teaching professional foreign language communication to marine engineers in a foreign language communication environment. The process of the step-by-step mastering of a typical labour task of marine engineers in a foreign-language environment with the help of computer support is considered. The necessity of forming professional foreign-language communication in the conditions of mastering typical tasks of professional labour is proved. The results of the experiment conducted in "F.F. Ushakov GMU" are given and the obtained data are analysed. Creating conditions for future marine engineers to predict the professional context of typical tasks of their activity in a foreign language environment, computer support ensures the learner's reflection of his/her own level of knowledge of algorithms of their solution, striving to achieve the efficiency of their use. This is the condition for the formation of his/her professional communication as the basis for the regulation of technological processes of his/her labour. It creates conditions not only for mastering a foreign language as an educational subject, but also orientates to the solution of problems of professional, intellectual and cultural development of the learner. Computer support of the future marine engineer's mastering of algorithms for solving typical sets of his professional operational tasks in a foreign-language environment provides fundamentalisation of his professional training, giving the cadet opportunities to accumulate experience of sociocultural regulation of his future work.

1. Introduction

The modern training of graduates in a maritime university is characterised by a number of peculiarities and teaching a foreign language as a means of solving professional tasks is one of them. The key to effective labour activity of a maritime specialist is a high command of a foreign language, which acts as a tool for forming the specialist's competence. The foreign language in this case is Maritime English, which is the main language of communication of seafarers. Maritime English language training at a higher education institution implies the formation of a high level of language proficiency and the possibility of foreign language communication in specific professional situations, taking into account the peculiarities of professional thinking. The content of the training of maritime specialists is strictly regulated by a number of normative national and international documents. In particular, there are state educational standards of the Russian Federation, the International Convention on the Training and Certification of Seafarers and Watchkeeping 78/95, the Convention on International Regulations for the Prevention of Collisions at Sea (IRCPSS) 1972, etc.. These requirements determine the level of qualification of a specialist in the maritime sphere and emphasise the importance of English language proficiency at such level that allows him/her to effectively perform his/her duties, since the future professional activity of maritime graduates in international waters involves communication in English. These are various tasks of receiving and transmitting information in English while on watch through various channels of audio-conductive communication on issues of navigation safety, manoeuvring, ship emergencies, communication with operators of coastal services of foreign countries in ports, towing, etc.

A naval officer in international waters is first of all a representative of his state, and in this case, the effectiveness of the arising contacts depends on his professional communication skills. Language training as an important component of his general culture acquires a special role, as an insufficient level of knowledge of a foreign language. It acts as a working language, adversely affects the whole system of effective communication with foreign colleagues, and in emergency and extreme situations can lead to tragic consequences.

The problems of teaching professional foreign language communication are investigated by many Russian and foreign authors (Filonenko et al., 2023; Leont'ev, 1987). G.M. Andreeva (1999) believes that communication has three interrelated aspects: communicative (information exchange between individuals), interactive (interaction between communicating individuals) and perceptive (the process of perception and cognition of each other by communication partners and establishment of mutual understanding on this basis). She emphasises that the interactive side of communication consists in exchanging not only knowledge, ideas, but also actions.

Foreign language communication of a specialist is the most important means of regulating his/her professional activity. In this case, according to L.S. Vygotsky, "...the more complex action is required by the situation and the less direct the solution path becomes, the more important the role of speech in the whole process becomes" (Vygotskij, 2005, p. 118).

The basis of professional communication is "socio-professional competence", the idealised model of which is presented by I.A. Zimnyaya in four blocks (2004). The first is basic intellectual-supporting (basic thinking operations at the level of normal development). This block is characterised by the

development of the abilities of analysis, synthesis, comparison, systematisation, decision-making, forecasting, correlation of the result of action with the proposed goal. The second is personal assuming the presence of a number of personal properties, such as responsibility, organisation and purposefulness. The third is social, socially supporting human life activity and adequacy of his/her interaction with society. This is an ability to manage in his/her behaviour the values of culture and social interaction, integration and use of knowledge when solving socio-professional tasks, communication in oral and written form in native and foreign languages, finding creative solutions to social and professional tasks, etc. The fourth is professional, reflecting the adequacy of professional activity, an ability to solve professional problems, etc.

Professional communication of a specialist in a foreign-language environment is an integrative quality of his personality, which acts as a basis for the regulation of the process of operative solution of his tasks associated with actions based on foreign-language information.

The effectiveness of the arising contacts largely depends on how deeply and adequately the foreign language skills of a maritime specialist are integrated into the general system of his professional activity. Therefore, it is important to define such strategy of his foreign language training, which would take into account the formation of the foreign language component of professional communication.

A number of studies (G.I. Verba, V.F. Tenischeva, etc.) provide data that due to the low level of professional foreign language communication skills, most graduates of maritime institutes have difficulties in performing their duties in situations where communication in English is necessary (Shverova et al., 2020; Tenishcheva et al., 2021; Verba, 2006).

2. Problem Statement

The processes of informatisation and globalisation affect the system of the professional training of marine specialists. A number of studies have shown the possibilities of computer support for learning a foreign language as an academic subject (Evdokimova, 2004; Karamysheva, 2001). These studies traditionally take a phrase, sentence, at best a text, and a professional has a fragment of subject context represented by a portion of information as the basic *unit of computer-assisted learning of foreign language* skills. As a result, either the exclusively informational linguistic component of a future specialist's activity or the professional-subject component is fragmentarily reproduced.

Ignoring in computer support of formation of communicative skills the technological component of the upcoming professional work of specialists related to the use of a foreign language in the conditions of intercultural communication, and in the formation of professional skills – the communicative component, leads to the formation of "facilitated" professional stereotypes of their activities. After all, the content of the communicative component of professional communication is not limited only to speech patterns, clichés and elements of non-verbal communication (professional gestures, hierarchical relations, flag, sound and light signals, rules of information exchange, distance between interlocutors, etc.). They should be used in the situation of foreign language communication. It also includes knowledge of the *necessity, appropriateness and promptness of* their manifestation in the technological processes of professional activity.

In this connection, it is urgent to develop psychological and pedagogical conditions of computer training, which would provide an adequate level of formation of professional communication of naval officer's activity mastered in the conditions of foreign language communication.

Taking into account the above-mentioned, the main component of professional foreign language teaching, in our opinion, is a typical labour task, which implies the use of foreign language speech in the context of a specific technological process.

We hypothesised that a computer support model would be productive if it was used to provide:

    i.   programming of the cadet's learning activity as a process of mastering professional standard tasks of a naval officer;

    ii.   inclusion of socio-cultural context in the algorithms of operative professional decision-making in a foreign-language environment;

    iii.   integration of components of professional foreign-language communication of an officer in the process of using speech regulations and etiquette by a cadet when mastering strategies of professional decision-making.

Competent professional activity of a specialist is determined by his/her ability to promptly solve typical labour tasks. It is known that professional activity of a naval officer, in particular, a ship navigator, in a foreign-language environment takes place in conditions of tension. It is caused not only by the need for continuous observation of the environment and vessel movement, control and evaluation of navigation situations, but also by negotiating in a foreign language with coastal services and foreign vessels.

We have developed a classification of typical work tasks of a naval officer taking into account the factor of foreign-language communication. In a foreign-language environment, these tasks are related to contact, remote and mediated communication.

Contact communication includes verbal and non-verbal methods of communication, which are used in professional interaction with representatives of a foreign state on various issues related to pilotage and mooring; working out interoperability during the settlement of incidents involving violation of international law, etc.

Remote communication is characterised by the knowledge of procedures for establishing, retaining and terminating contact by a telephone/radiotelephone and rules of information exchange (marking messages, repeating and rehearsing key points of information, etc.). Operational mastery of algorithms of professional non-verbal communication is a guarantee of productive use of a foreign language as a means of solving a number of technological tasks: designation of actions and intentions by means of flag, sound and light signals, signals of manoeuvre guidance (professional gestures in helicopter operations, etc.); provision of medical aid by means of code signals, etc.

Possession of various methods of *mediated communication* (official letter, telegram, telex, etc.) taking into account the information of national-cultural character is a condition for the implementation of professional activities related to the execution of documentation in English, concerning maritime safety, emergency and non-emergency incidents at sea. The solution of typical labour tasks presupposes knowledge of etiquette, national specificity of language means use, appropriateness and efficiency of their use.

We have developed an *integrative-contextual information module of computer support*, through which the professional context of typical tasks of a naval officer is consistently recreated. As a result, the mechanism of efficiency and adequacy of professional actions fulfilment is formed.

In the process of mastering a typical task of professional work of marine specialists with the help of computer support, the following components of professional communication in a foreign-language activity environment are mastered:

i. *linguistic component* represented by a foreign-language thesaurus included in the technological processes of a typical future labour task (standard phrases of the relevant section of the professional vocabulary-colloquial dictionary);

ii. *speech or* models of communication characteristic for the mastered typical task of professional activity of a specialist taking into account speech regulations and etiquette;

iii. *reflexive or* associative links between the realities of the subject context of a typical work task and their corresponding linguistic and speech forms;

iv. *interactive or* algorithms of verbal and non-verbal communication, interfaced with decision-making technologies.

The professional-activity component, represented by integrated professional-subject and foreign language-speech skills of a future naval officer to promptly solve situational tasks in situations of intercultural communication, forms the orientation basis of his professional activity in a foreign-language environment.

By means of the integrative-contextual information module, the gradual assimilation of the above-mentioned components of professional communication of a naval officer and their integration into the system representing an integral characteristic of his personality is programmed.

3. Research Questions

In situational tasks simulated using a computer, training should be aimed at developing adaptation skills to the national accents and sociocultural characteristics of communication partners, at the accuracy of revealing the contextual meaning of individual words and blocks of information in a foreign language and the efficiency of their correlation with the subject characteristics of an object or process management. At the same time, there must be a need for students to develop readiness to perceive, comprehend and use foreign language information. The components of cadets' quasi-professional activity and their content must be determined taking into account their foreign language speech activity as a means of solving professional problems. To evaluate the activities of cadets in the process of computer training, we identified the following components:

i. –understanding the general idea of the speaker's information (P)

ii. the accuracy of disclosing the contextual meaning of semantic blocks in a foreign language (T) – is determined by the adequacy of the student's quasi-professional action based on foreign language information;

iii. the efficiency of correlating foreign language information with the subject characteristics of an object or management process (O) – is set by a programmed time

limit allotted for the operation, and the compliance of its implementation with the standard is assessed;

4. Purpose of the Study

The main goal of the study is to confirm the hypothesis that the preparation of maritime specialists for professional activities in conditions of foreign language communication is due to the modeling in training of typical tasks of its activity, associated with the need to make decisions on the basis of foreign language information in conditions of time shortage with computer support. At the same time, the didactic complex of innovative technologies, including information computer technologies, should have been aimed at mastering a foreign language at the level of professional algorithms in the process of the future maritime specialist mastering his professional tasks.

5. Research Methods

Therefore, the professional communication of a naval officer in a foreign-language environment is a constellation of linguistic, speech, reflexive, interactive and professional-activity components, which act as a means of regulating the process of operative solution of his professional typical tasks associated with actions based on foreign-language information.

The mastering of each component of professional communication of a future marine specialist, "woven" into the solution of a typical task of his/her work, takes place through the performance of a number of micro-tasks presented in the form of test tasks. Each micro-task, which is a text or graphic form of a task reflecting the subject, socio-cultural and psychological (modelled by a strict time limit for the operation) contexts of the professional activity fragment being mastered, is presented in the training and control modes and has a sound accompaniment based on a phonogram read by native speakers.

The computerised process of cadet's training actions in mastering each component of a typical work task of a specialist can be represented by a description of each component of training actions. They are a presentation of a microtask for performance; analysis of the presented material and solution of the microtask; reference-to-reference information; input of the result of the task solution into the computer; analysis of the result and issuance of statistical information on the correctness of microtask performance.

Computer support provides repeated execution of the exercise to correct erroneous actions and its control execution, ending with the presentation of the analysis of its result, which is recorded by the teacher.

Working in the learning mode, the student has the opportunity to use a hint. Reliance on a hint in the process of performing a microtask contributes to the organisation of the cadet's thinking actions, the desire to improve the existing result. The student imagines and experiences in his/her imagination professional actions related to the microtask being learnt, comprehends and compares the presented tasks with possible work situations and his/her role in them.

The answer is formed in various ways: choosing its correct variant, translation, constructing words, phrases and sentences, matching a picture to the available information, filling in the gaps. Before the final control test, cadets perform error correction work.

Performance is monitored against the following parameters:

i. speed of task completion (time spent on solving a microtask, estimate in per cent);

ii. the number of correct and incorrect reproductions.

Within the framework of mastering the components of professional foreign language communication, a series of situational tasks were worked out with the help of computer support. The adequacy of their performance was assessed using the method of component analysis of test papers. The following components of students' activity were identified: speed of decision-making (S); rationality of quasi-professional action in foreign language communication (R); communicative involvement (CI).

The experimental results of the component analysis and solving situational problems are summarised in Table 1.

Table 1. Results of the component analysis of the solution of situational tasks and control groups

Test subjects (n=68)	Component assimilation rates, in %			Overall average indicator of the basics of professional communication, in %
	C	**P**	**EF**	
EG (n=33)	86.36	96.97	90.40	91.24
CG (n=35)	52.86	67.14	31.43	50.47

Table 1 shows that the overall average index of activity components in the process of solving situational tasks in the experimental group (EG) was 91.24%; in the control group (CG), trained according to the traditional method, there was only 50.47%.

The index of speed of decision making (C) in the experimental group was 33.5% higher than that in the control group.

Rationality of performing quasi-professional actions (R) in the experimental group was 96.97%; in the control group, it was 67.14%. Communicative involvement (CI) in the process of solving a professional task was 90.40% and 31.42%, respectively (Table 02).

Experimental verification of the effectiveness of the information module of training has shown that computer support provides productive formation of professional communication of a naval officer in the educational process. It also provides programming the mastering and integration of its components in the process of using the cadet speech regulations and etiquette in the algorithms of professional decision-making in a foreign-language environment.

6. Findings

Table 2. Map of component analysis of student adaptation to the national accents of communication partners in the process of mastering a typical labor task with the help of computer support

Program information	Components		
	П	**Т**	**О**
Operation	Ratings in conditional points ("1" or "0")		
1. Choosing the correct answer			
2. Filling in the blanks			
3. Constructing a proposal			
4. Keyboard typing			

Sum of points for mastering the component
Component absorption rate, %

Conventions: P – understanding of the general idea of the speaker's information; T – accuracy of revealing the contextual meaning of semantic blocks in a foreign language; O – efficiency of correlating foreign language information with the subject characteristics of an object or management process.

The results of the formation of adaptation skills to the national accents of communication partners based on two training computer programs and one control program, the following conclusions were drawn that all components of the activity in the initial phase of training were at a low level of formation. The accuracy of disclosing the meaning of incoming information was 28.57%, since students had difficulty grasping its general content, while at a very low level of efficiency - 8.57%.

After completing the second program, the indicators of all components of the activity increased: by 20% - understanding of the general content of information, by 52.96% - accuracy. Operational efficiency increased to 27.14%. An objective picture of the growth of its formation was observed in the process of executing subsequent computer programs after gaining experience in working with prompts, which took a lot of time.

The control results indicate a significant increase in the indicators of all components of activity. Understanding of general information increased to 97.14%, which indicates that almost all cadets have developed the skill of perceiving technical information in English, pronounced with different accents.

The accuracy of revealing the contextual meaning of semantic blocks in a foreign language increased to 74.29%. Since control is carried out without prompts and with a time limit, this indicator is 7.14% lower than that achieved during the execution of the second computer program.

In general, the individual qualities of students in the process of activity, under the influence of its requirements, came into motion. The efficiency of activities amounted to 67.14%, increasing more than 7 times.

The above analysis shows that the exchange of foreign language information in the process of mastering a typical labor task is realized through various components and actions, each of which "in its own way" adapts to the conditions and requirements of the activity.

7. Conclusion

Creating conditions for future marine engineers to predict the professional context of typical tasks of their activity in a foreign language environment, computer support ensures the learner's reflection of his/her own level of knowledge of algorithms of their solution, striving to achieve the efficiency of their use. This is the condition for the formation of his/her professional communication as the basis for the regulation of technological processes of his/her labour. It creates conditions not only for mastering a foreign language as an educational subject, but also orientates to the solution of problems of professional, intellectual and cultural development of the learner.

Computer support of the future marine engineer's mastering of algorithms for solving typical sets of his professional operational tasks in a foreign-language environment provides fundamentalisation of

his professional training, giving the cadet opportunities to accumulate experience of sociocultural regulation of his future work.

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