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# Communicating under stress and time pressure: foreign language teaching methodology

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**ABSTRACT**

The language-based miscommunication often has an emotional background, especially in non-standard situations, and leads to unintended consequences and even human losses. The analysis of English for specific purposes (ESP) curricula reveals the problem of insufficient attention paid to the development of professionally significant personality traits that determine the ability to avoid miscommunication. The research is based on the military context just because their mistakes might be fatal, but the fundamentals of the developed methodology can be applied to any ESP training. Case studies of language-based errors in military operations and behavioral observations to assess cadets' emotional stability were used to develop the methodology. The study's objectives were to identify factors affecting communication reliability in military operations and to propose methods for developing cadets' professionally significant qualities that influence behavior under stress and time pressure. The article aims to present an English teaching methodology for the development of errorless communication skills. The novelty of this manuscript lies in its comprehensive and practice-oriented approach to military English teaching that integrates pedagogical methods with military simulation technologies, aligning instruction with NATO STANAG 6001 standards. The findings contribute to military language education and may serve as a model for similar high-stakes professional training environments.



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## 1. INTRODUCTION

Communicating information is a vital part of military decision making. The earliest military communications were delivered by runners. Since then, communications have greatly progressed. As an example, Jane's Military Communications "include text, audio, facsimile, tactical ground-based

communications, naval signaling, terrestrial microwave, tropospheric scatter, satellite communications systems and equipment, surveillance and signal analysis, security, direction finding and jamming" [1]. Now, military applications such as Blue Force Tracking, inter-team communications, remote unmanned vehicle control, and sensor data mining/fusion in tactical environments are used to adapt to rapidly changing conditions and military needs. The quantum systems are going to "allow communication and sharing information across the network between individual units and the commander to respond quickly to battlefield developments and for coordination" [2]. However, the human factor still leads to fatal consequences due to language miscommunications [3], [4]. This problem is worth deeper consideration because the armed forces increasingly work together in multinational alliances and coalitions [5]. Moreover, the lack of eye contact and body language in radio communication causes additional stress for those who communicate in a non-native language.

The following examples clearly illustrate how communication errors and the inability to check, confirm, and clarify information can lead to human losses. The bomber crew was executing an authorized order, but the crew members did not take reasonable precautions to ensure they knew where friendly forces were located. Despite discrepancies in reported U.S. troop locations–suggesting that something may have been amiss–the aircrew did not take necessary steps to validate its information before launching the bombs. The movement of the six was not properly communicated to those coordinating with the bomber crew. The members of the ground forces incorrectly communicated some troops' positions. These failures led to the mistaken conclusion that the targeted U.S. and Afghan soldiers were insurgents. "The key members executing the close air support mission collectively failed to effectively execute the fundamentals, which resulted in poor situational awareness and improper target identification" [6].

In 1951, British soldiers were overwhelmed by the Chinese. When an American general asked for a status update, a commander replied, "things are a bit sticky down there." Americans understood it as not too bad, therefore no reinforcement was sent, and almost all the troops were killed because of the miscommunication [7]. Once more, this example shows that language competence and efficient interpreting are imperative for a complete understanding of a situation. On April 22, 1951, 650 British soldiers were confronted by 10,000 Chinese soldiers, during the Korean War. In the midst of the ensuing battle, with ammunition running perilously low, Brigadier Thomas Brodie took a radio call from an American Major-General, enquiring about the regiment's condition. Taking Brodie's colossal British-style understatement "things are a bit sticky down there" literally, the American chose to defer sending reinforcement until the following morning. Only 40 of the Glosters survived.

In the early 2000s, we conducted a doctoral study on the language teaching of air traffic controllers and developed a methodology based on the aircraft accident investigation reports. Its effectiveness was experimentally confirmed [8]. The methodology was successfully implemented and proved that it contributes to the compliance of air traffic controllers' and pilots' language teaching with the International Civil Aviation Organization (ICAO) requirements. Similarly, to the ICAO Aviation English Language Proficiency Requirements, North Atlantic Treaty Organization (NATO) has Standardization Agreement (STANAG 6001). Transition to the NATO language proficiency standards for military personnel in Ukraine is becoming increasingly important. Therefore, the English proficiency requirements for cadets have been tightened. The professional activity of aviation and military personnel have much in common, namely similar professionally significant personality traits as well as a high probability of stressful situations [9], and the importance of motivation [10]–[12]. Therefore, we consider that the same approach should be applied to military staff teaching.

The problem is that even a high level of English does not ensure error-free communication. The language-based miscommunication often has an emotional background, especially in non-standard situations. The analysis of the cadets' English curriculum reveals the lack of attention paid to the emotional intelligence (EI) that determines cadets' communicative competence. Therefore, in 2021, we conducted a study on cadets' language training based on the analysis of language errors that might lead to fatal consequences and focused on the development of error-free communication skills and professionally significant personality traits. We consider that in cadet language training, we should always keep in mind the human factor psychological aspect to contribute to achieving the intended professional training outcome.

The article aims to present a cadets' military English teaching methodology, providing their ability to avoid miscommunication in non-standard situations. The significance of the research is that the ability to conduct errorless communication might considerably mitigate risks and save lives for those who are on the front line and have to overcome difficulties of communicating in a non-native language while performing their duties. The research objectives are: i) to find out how language issues affect military operations; ii) to study how multilingual soldiers should communicate in mission areas to overcome communication errors in a non-native language environment; iii) to develop a military English teaching methodology based on the analysis of miscommunications and focused on the development of error-free communication skills; and iv) to conduct a pedagogical experiment to check the effectiveness of the developed methodology.

Furthermore, the study raises the following research questions:

- How can stress, time pressure, and emotional factors influence the reliability of communication in military operations?
- What are the ways to develop professionally significant qualities that determine cadets' communicative competence?
- What kind of exercises can contribute to the ability to avoid miscommunications?
- How can the developed methodology contribute to safety in the military?

The research hypothesis is that the use of internet-based methodologies for teaching English, with a focus on developing professionally significant personality traits, particularly the ability to communicate effectively under stress and time pressure, reduces the risk of language-related misunderstandings in non-standard situations. The methodology, designed for military, can be adapted for other areas of English for specific purposes (ESP) training. The methodology development was preceded by a literature review on pedagogy, psychology, and military science [13]–[18], NATO language standards STANAG 6001, curricula, and examples of communication errors. Observations to determine the level of motivation and the degree of emotional stability were carried out via video games [19], that simulate the stressful conditions of military activity. NATO STANAG 6001 tests were used to assess the cadets' language proficiency [20].

Teaching military English requires a special approach due to the specifics of the professional activities of servicemen, the high probability of non-standard situations occurring during combat operations, the need for communication under stress and a lack of time [21]–[23]. Standard phraseology does not cover all situations in military operations. In addition to the fact that communication in a non-native language can cause discomfort, which affects the efficiency of professional activity [24]–[26], numerous studies have shown how common is the phenomenon called "code switching", when the speaker uses grammatical or lexical structures of the native language that changes the meaning of what was said. Concise and easily understood communication in simplified English with clear pronunciation is a must to ensure safety in emergency [27]. Cadets should feel comfortable, be able to better express their ideas and contribute during discussions without having to deal with vocabulary, pronunciation and grammar issues [28].

The developed methodology is based on the systems, active learning, problem-based, communicative, and result-driven approaches, as well as the personality theory and theory of the step-by-step formation of mental actions [29]–[31], as shown in Figure 1. Positive emotional stimuli are used for longer retention in memory and easier recall with greater accuracy and readiness [32]. Although considerable attention is paid to various approaches to ESP training, a review of the literature showed that there is a lack of research on how to develop cadets' ability to avoid misunderstandings in a non-standard situation under stress and time constraints.

The methodology focuses on communication under stress, eliminating miscommunication, developing professionally significant personality traits, and using real cases, simulations, and active learning. Therefore, it can be implemented in any non-military field. We suggest the set of adaptation principles: replacement of military case studies with industry-specific incident reports; replacement of combat-based simulations with job-specific simulations; maintenance of professionally significant traits development; retention of the error-analysis approach; and use of mixed-format assessments relevant to the profession.

As the methodology was developed and validated within the context of Ukrainian higher military education, it introduces several cultural and linguistic limitations that may influence the generalizability of the findings. Participants were the Ukrainian cadets with shared linguistic and cultural backgrounds, contrasting with the diverse communication styles found in multinational NATO teams. As a result, the methodology addresses Ukrainian-specific challenges but does not fully account for issues typical of Romance, Turkic, Germanic, or Asian language speakers. Cultural differences in communication under stress, including varying expectations for hierarchy, directness, and clarification, further affect how miscommunication arises and is resolved. Although simulations approximate international conditions, they cannot fully reproduce the cultural and linguistic diversity of real multinational operations. Nevertheless, the methodology's core principles can be broadly applicable. Expanding linguistic samples, incorporating culturally diverse case studies, and engaging international partners would enhance its relevance for multinational environments.

The methodology integrates EI training into military English teaching as a core component of communicative performance under stress, rather than as a standalone subject. EI development is embedded into stress-graded tasks, simulations, and reflective practice, targeting competencies such as emotion regulation, frustration tolerance, empathy, and clarity under pressure. Drawing on the step-by-step formation of mental actions, personality theory, and a systems approach, the training systematically links EI with communication and decision-making. Cadets develop EI through progressive stress exposure, structured reflection, instructor-modelled regulation strategies, and simulation video games that make emotional reactions audible and observable. Professionally significant traits are reinforced through role-plays and time-

limited problem-solving. EI is assessed behaviorally through simulations, speaking tasks, and peer/self-evaluations. EI is treated as an operational competency essential for reliable, error-free communication.

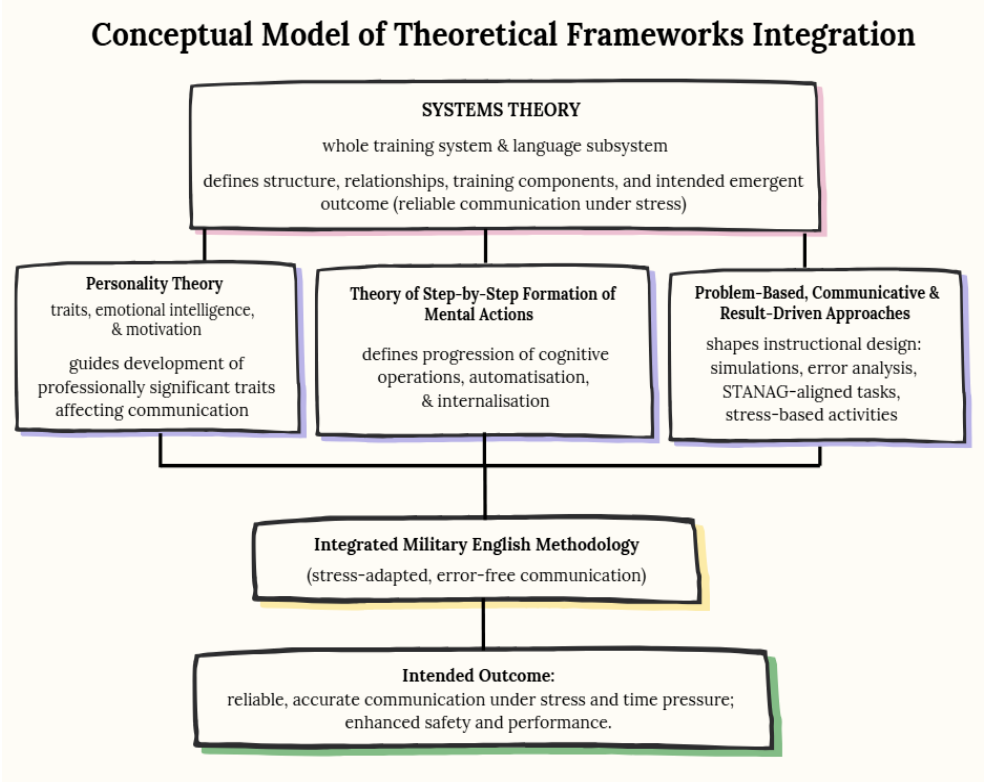


Figure 1. Integration of theoretical frameworks in the military English teaching methodology

## 2. METHOD

The following research methods were used as shown in Figure 2. Data analysis and investigation of the miscommunications were the key methods in our research. Case studies made it possible to identify common communication errors and understand their nature. The active teaching approach was used to motivate cadets to be involved in discussions. Problem-solving, case studies, and military simulation video games with voice acting were intended to enhance their proficiency in communicating in a non-native language while executing professional duties [33].

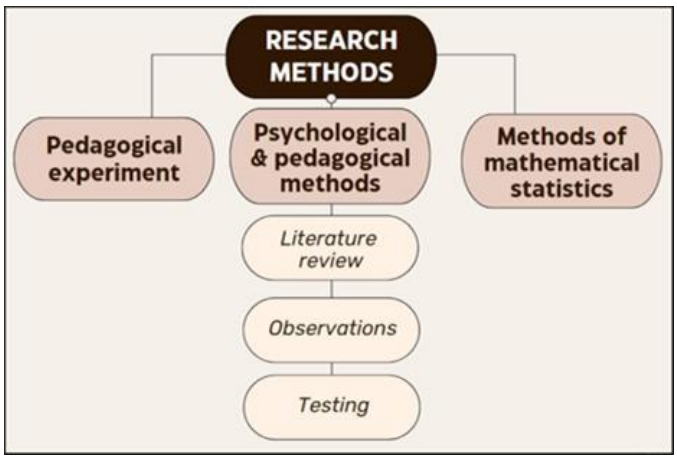


Figure 2. Research methods

To ensure the validity of the study, we employed case studies, focus group discussions, behavioral observations, and standardized language assessments using NATO STANAG 6001 standards. The content validity was reinforced by grounding our methodology in real military communication failures and aligning instructional content with ICAO and NATO requirements. We addressed the validity of the study by incorporating psychological and pedagogical theories that directly relate to communication under stress and time limits. Clearly defined experimental group (EG) and control group (CG) further support the study's internal validity. To establish reliability, the pedagogical experiment was repeated across four academic years and multiple institutions, yielding positive outcomes. Standardized tools and assessment methods were applied across all experiments. The statistical significance of the results was confirmed using the student's t-test (t=2.92), which demonstrated measurable improvements in language performance and communicative competence within the EG.

To enhance methodological rigor and ensure alignment with internationally recognized approaches to emotional competence, we consider integration of the Mayer-Salovey-Caruso emotional intelligence (MSCEIT) model elements into the curriculum. Incorporating this framework is to provide a scientifically validated foundation for the EI component of military English instruction and directly support cadets' communicative performance under stress. It will strengthen the link between communicative competence, decision-making under pressure, and overall professional reliability in military and non-military ESP training.

### 2.1. Participants

The experiment was conducted at the Faculty of Military Training of National Aviation University (Kyiv, Ukraine). During the 2022/2023 and 2023/2024 academic years, four groups of cadets with an average of sixteen students per group were trained according to the developed methodology. The number of respondents was determined by the number of cadets studying at that time. However, during the 2020/2021 and 2021/2022 academic years, the same pedagogical experiment was conducted at the National Aviation University (Kyiv, Ukraine) and Flight Academy of the National Aviation University (Kropyvnytskyi, Ukraine). It involved four groups of pilots and five groups of ATCs with an average of 12 students per group.

The sample size for this pedagogical experiment was determined by natural sampling constraints, based on the number of cadets enrolled. This resulted in a total sample size of approximately 148 participants. Because of the number of people who were enrolled in the institution, the sample size was limited. However, the methodological approach and statistical validation used reinforce the fact that it was sufficient. Norman *et al.* [34] highlight that 12-15 participants per group can provide meaningful insights when the effect sizes are moderate to large and complemented by qualitative data like interviews and observations. In our study, pre- and post-assessments in general and military English, as well as interviews, observations, and military simulation video games allowed for comparative analysis between the EG and the CG. The effectiveness of the methodology was statistically verified using student's t-test (t=2.92), confirming significant improvement in the EG. This sample size aligns with accepted practices in pedagogical research, where these numbers of participants per group are thought to be adequate when the experiment is repeated to detect medium-sized effects [34], [35]. Therefore, the chosen sample size is adequate and methodologically justified for assessing the effectiveness of the developed military English teaching methodology.

### 2.2. Research instruments

The investigation included analyzing language-related incidents and accidents, observing cadets' behavior, and conducting focus groups to assess the effectiveness of the developed methodology. By examining cases where errors were unacceptable, the study identified the root causes of miscommunication. Studying of cadets' behavior in non-standard situations made it possible to identify which personality traits should be developed through targeted language training. The developed military English teaching methodology is focused on the unique aspects of cadets' profession and critical analysis of their communication mistakes. Its effectiveness was proved by the experiment.

Our analysis of misunderstandings in military contexts revealed that most of these incidents have emotional background and identified the qualities that influence cadets' communicative competence. These findings were integrated into the cadets' English curriculum. A methodology that incorporates the outcomes of the research was developed, and the experiment proved its effectiveness. Cadets' language teaching was considered as a subsystem in their professional teaching system, as shown in Figure 3.


Figure 3. Cadet professional training system

### 2.3. Methodology approaches and principles

The theory of the phased formation of mental actions enhances the accumulation of specific methods of professional activity, improving the efficiency of knowledge acquisition and the development of cadets' skills and abilities. Meanwhile, the theory of personality provides insights into how diverse mental properties integrate into a cohesive system [36]. Applying this theory enabled us to account for the influence of personal qualities on military performance, ensuring these factors were incorporated into the training process. At the same time, the interconnection and interdependence of the components make it possible to obtain the emergent effect of the methodology. Therefore, using systems approach allows both determining the strategy of scientific research and hypothetically predetermining the intended result, i.e., to reliably perform professional tasks on the background of non-native communication in stressful situations.

The developed methodology is based on the fundamental principles and the specific procedural didactic principles of professional teaching of operators of complex control systems, i.e., strict regulation and time limits of mastered actions, additional psychological and physiological stress against the background of the main activity, and integrated development of psychological and physiological qualities and adaptation mechanisms. The principle of strict regulation and time limits of mastered actions is determined by the peculiarities of professional activities of the military, which are usually carried out under time pressure and large amount of information coming from the complex control systems and then having to be quickly processed and re-coded into speech. Thus, this principle contributes to the development of the ability to avoid miscommunication in a non-native language in a time-limited environment.

The principle of additional psychological and physiological stress against the background of the main activity is based on the phenomenon of forced economization of the mental costs via modelling additional psychological and physiological load under extreme conditions. The mental costs decrease as the mastered actions improve. It leads to cadets' self-confidence, overcoming the language and semantic barriers, reduce of the emotional and physiological costs caused by non-native language communication, freeing up time and attention reserves to make and implement complex decisions. The principle of the integrated development of psychological and physiological qualities and adaptation mechanisms provides development of professionally significant personality traits. Since overcoming the language and semantic barriers is the most important task of a language teaching, it is efficient to correct students after the fact. Taking notes on common mistakes that cadets make and then presenting them to the class ensures the natural learning process required to achieve competency and fluency [37].

In our previous research, we studied numerous cases of English misuse in aircraft accidents and distinguished "the mental and psychophysiological qualities that determine the professional competence and reliability of pilots and air traffic controllers in extreme situations." Having analyzed the use of English as a non-native language military environment, we concluded that pilots, air traffic controllers, and the military must have almost the same professionally significant abilities and skills due to the similar conditions of their professional activity. Table 1 presents some examples of internet resources to train skills and improve abilities that are professionally significant for the military. Since there is no special educational discipline to train these qualities, any discipline training should contribute to the achievement of the intended goal of the professional training.

Table 1. Internet resources to develop professionally significant abilities and skills

| Professionally significant abilities and skills | Internet resources |
|---|---|
| Ability to make quick and correct decisions in a constantly changing environment | Decision trees for decision-making, heuristic trees |
| Ability to perform mental actions at a high pace | Mind games |
| High attentional capacity | B-trainika, CogniFit |
| Ability to accurately assess the situation and the duration of actions | BARD observation games |
| Ability to make non-standard decisions | Arlena's rush game, heuristic trees |
| Logical thinking | BARD logical thinking games |
| Reaction Time | BARD reaction time, first-person shooter games |
| Ability to avoid selective perception and tunnel vision and selective attention | HappyNeuron pro attention exercises and games, CogniFit |
| Visual and heuristic thinking | Heuristic trees, graphic Change® Academy |
| Conflict management skills | ShineBright |
| Low aggressiveness and ability not to put the blame on others | Sharing Wisdom's coping with stress and anxiety reading exercises |
| Adequate self-esteem | How's Your Self-Esteem? (TeensHealth Quiz), self-esteem test (phychology today) |
| Critical thinking | The foundation for critical thinking workshops, 123test critical thinking test, TED-Ed lessons |
| Ability to work under time limit | Knoword Quick Play or any other exercises with time limit |
| Highly developed operational, short-term and long-term memory | Huberman lab episodes |
| Accuracy and constancy in perception | CogniFit |
| Purposefulness | Education.com writing with purpose |
| Imagination and constructive thinking | Mind mapping, brainstorming |
| Tolerance to frustration | AI frustration tolerance trainer |
| Ability to learn new skills and adapt them to a changing environment | Virtual classrooms, learning management systems, simulation training |
| Low neuroticism | Virtual reality technology |
| Low level of emotional sensitivity, vulnerability, gentleness, and empathy | PositivePsychology.com EI exercises, VR technology |
| Low motivational stress | XR technology |
| Observation and perception | MindSnap, CogniFit |
| Multitasking | BARD multitasking games |
| Motor skills | BARD fine motor skills |
| Hand-eye coordination | BARD hand-eye coordination, CogniFit |

### 2.4. Methodology objectives

The objectives of the methodology include the development of professional motivation, high motivation to analyze special and critical situations during combat operations; emotional stability in emergency. In addition, the ability to perceive and keep in memory the spatial and temporal characteristics of the combat situation, recreate its dynamic model according to the information received in a non-native language; sustainable skills to analyze the alternative models of the combat situation, make non-standard decisions in the form of instructions in English in emergency. The next is perform errorless communication under emotional stress, the deficit in cognitive function, frequent recourse to long-term memory, chronic overload of working memory, and intensive use of the function of attention. Lastly, the ability to analyze emergency situations and the ability to foresee the development of the situation and pre-empt the result of the activity.

By the end of the military English course cadets must be able to conduct professionally oriented communication, express point of view; show fluency and coherence, relevant vocabulary, proper grammar use, and accuracy; ensure fluent, clear, concise and unambiguous communication; obtain and provide information without eye contact in radio communication; avoid misunderstandings; clarify information to resolve misunderstandings; minimize code-switching as a common phenomenon of alternation between two languages within a single conversation in a bilingual environment; paraphrase; slow down the rate of speech with those who experience language difficulties in multinational environment. The methodology based on the analysis of language errors that might lead to fatal consequences and focused on the development of the errorless communication skills was scientifically substantiated and developed. The methods of problem-based learning are considered predominant.

### 2.5. Methodology coverage

The methodology includes: i) analysis of how language issues affect military operations and how soldiers cooperate in mission areas to overcome such issues; ii) analysis of the cases of miscommunications to develop the ability to analyze critical situations using scientific research, problem-search and binary methods of analysis; iii) simulation modelling to create and analyze a digital prototype of a real communications that contain failures like "inappropriate speech rate, pausing, pronunciation, stress and intonation, the organization of information, as well as slips of the tongue" [38] to predict possible language

errors that might occur under stress and psychological related constraints in the real world; iv) military simulation video games with voice acting to practice professionally oriented communication and develop dialectical and practical thinking, attention, imagination, memory, and other professionally significant personality traits; v) listening tests utilizing visual and non-visual communication samples to practice understanding of international user's pronunciations in lack of eye contact and body language in radio communication [39]; vi) independent extra-curricular activities to get ready for international military exercises.

Since the professional activities of aviation and military personnel have much in common, ICAO Manual 9835 served as a content basis for tasks development. The features of military communication such as strict subordination, decisiveness, and brevity were taken into account. The features of the international users' pronunciation like "long/short vowel length distinctions (e.g., hit/heat), the correct placing of nuclear stress (e.g., radar), the marking of tone boundaries (i.e., significant changes in voice pitch or the direction of intonation which identify new components of a message), and the avoidance of simplification or reduction of some consonant clusters (ICAO Manual) were also considered. The methodology includes the following assessment methods: grammar, vocabulary, and listening tests to assess the ability to recognize errors and avoid misinterpretation of the meaning; problem-solving assessment tasks to reveal the degree of flexibility of knowledge, skills and abilities, i.e., the ability to apply them in non-standard situations; final military simulation video game with voice acting assessment. There are some examples of the tasks we designed to develop cadets' errorless communication skills.

– Implicit and explicit communication

Task 1: learn the difference between "explicit" and "implicit" and fill the gaps with "implicit" or "explicit".

| Explicit=clear and precise, leaves nothing to implication. We mean exactly what we say. | Implicit=understood though not plainly or directly expressed |
|---|---|
| *"I'm hungry. When are we going to eat?"* | *"Could you pass me that chocolate?"* |
| *"Hand me a chocolate, please."* | *"Yes, I could,"* the little girl replies, as she grabs and eats it herself. |

i) The commander's intentions were not made _____.
ii) The soldiers found an _____ political statement in their commander's remarks.
iii) Let me be _____, I do not support this.
iv) We have not finalized the decision, but have an agreement.

– Commonly confused words

An exercise aimed at developing the ability to accurately apply vocabulary in practice, working with synonyms as a source of misunderstanding.

Task 2: fill the gaps with the appropriate terms from the tables in each of the following sentences.

| | |
|---|---|
| Emergency | an unexpected dangerous situation that must be dealt with immediately |
| Warning | signals, that tell you that something bad, annoying, or dangerous might happen |
| Alert | a warning to be ready for possible danger |
| Caution | a warning to be careful and trying to avoid danger |
| Malfunction | a fault in the way machine operates |
| Fault | something that is wrong with a machine or system which prevents it from working properly |
| Failure | an occasion when a machine stops working properly |
| Damage | physical harm caused by something or someone |
| Defect | a lack of something that means that something is not perfect |

i) While operating with English-speaking troops, it is vital to understand the various commands and _____which are used. Your life may depend upon it! (warnings)
ii) Missile attacks on high voltage cables, transformers and substations triggered the first ever simultaneous _____ shutdown, or "scram", of all four Ukrainian plants. (emergency)
iii) Attacks on power infrastructure aim to _____ the morale of Ukraine's civilian population. (damage)
iv) Europe's largest oil refinery suffered a _____, a potential source of jitters for the continent's refined fuels market where supply has already been hit by industrial action. (malfunction)
v) Although Xiong has managed military contacts between Washington and Beijing for a number of years, these meetings should be approached with extreme _____. (caution)
vi) Norway will put its military on a raised level of _____ from Tuesday, moving more personnel on to operational duties and enhancing the role of a rapid mobilization force in response to the war in Ukraine. (alert)
vii) It will help us correctly diagnose the _____ and send the right engineer so we can fix it for you. (fault)
viii) A military disaster is the defeat of one side in a battle or war which results in the complete _____ of the losing side to achieve their objectives. (failure)
ix) The government also contended that 3M failed to disclose the design _____ to the military. (defect).

– Paraphrasing

Paraphrasing exercises are efficient to develop cadets' ability to confirm and clarify information. Task 3: write a paraphrase of each of the following passages. Try not to look back at the original passage.

In March and April 2021, Russia started a major military build-up near the Russian Ukrainian border. On 24 February 2022, Russia invaded Ukraine in a major escalation of the Russian Ukrainian War, which began in 2014. Up to 200,000 Russian soldiers were sent into Ukraine on 24 February to sweep into the capital Kyiv and depose the government. The invasion began at the dawn, with infantry divisions and armored and air support in Eastern Ukraine, and dozens of missiles attacked across both Eastern Ukraine and Western Ukraine. The main infantry and tank attacks were launched in four spearhead incursions, creating a northern front launched towards Kyiv, a southern front originating in Crimea, a south-eastern front launched at the cities of Luhansk and Donetsk, and an eastern front. Dozens of missiles strike across Ukraine reached as far west as Lviv.

– Giving definitions, hot-seat game

Giving definitions is a game to overcome the language barrier and develop the ability to transmit information accurately and concisely even in case of a vocabulary gap or when an interlocutor is experiencing language difficulties. Cadets sit facing the board. One of them takes the 'hot seat' in front of the class, facing the classmates and his/her back to the board. The teacher writes the words one by one on the board. The aim of the game is for the cadets to give a definition of that word to the cadet who is in the hot seat. The more quickly the word is guessed, the better the definition is. It is very important to pay attention to the key word that narrows the search. Task 4, give a short definition to the words below paying attention to a key word.

fuel–a SUBSTANCE that is burned to provide heat or power
problem–a DIFFICULT SITUATION that needs to be dealt with
radar–a SYSTEM that uses radio waves to find out the position of something you cannot see
militant–a PERSON engaged in warfare or combat
noise–a SOUND that is often loud and unpleasant
accuracy–the ABILITY to hit the target without making mistakes
breech–a rear PART OF a barrel
cannon–a large WEAPON that fires large projectiles over long distance
combat zone–the AREA where fighting between armies takes place
commander–a PERSON who is officially in control of military unit
communications satellite–a PIECE OF equipment sent into space that travels around the Earth and passes television, radio, and telephone signals from one place to another

– Writing a report

Task 9: You captured a traitor Jane Fonda in the enemy-occupied territory. Read the information in the file copy, report it to your superiors and tell them what actions you have taken.

– Case study

Task 5: read and discuss how the conversation should have been conducted?
Situation sample:
In 1951, British soldiers were overwhelmed by Chinese. When an American general asked for a status update, a commander replied "Things are a bit sticky down there." Americans understood it as not too bad, therefore no reinforcement was sent, and almost all of the troops were killed because of the miscommunication.

– Immediate response

The military proverb "if you think for a long time, the first thing that comes to mind is a bullet" proves the necessity of improving the cadets' skills to response immediately. Any exercises with time limit are good for that.

Task 6: work in pairs. You have two minutes to ask and answer as many questions as you can.

– Listen-and-answer mini stories

To speak quickly and to understand instantly, automatically, and immediately the A. J. Hoge's (Hoge) Rule 7 was applied. Using his listen-and-answer mini stories instead of the old listen-and-repeat way to learn English, which does not make you think, is much more powerful. These are special kind of stories where the teacher asks a lot of questions. The cadets answered them constantly like in a real conversation. They taught themselves to understand and respond quickly, easily, and automatically. It is a power way to learn how to think in English.

– Movie segments

Movie segments were used to get the cadets ready for the final game. “Johnny English Reborn” [40] is an example to voiceover or comment every single action in the segment while they are watching it.

Task 8: pre watching exercise

Before watching the segment, put the words in the right order to make imperative sentences:

| | |
|---|---|
| up / lock / it | your / pocket / go / to / right |
| that / maintain / tone | act / just / natural |
| confrontation / keep / avoid / eye-contact | trigger / pull / the |
| table / go / the / stand / to / up / and / coffee | fire / hold / you |

– Verb tenses understanding

Verb tenses inform how an action relates to time and can create a lot of confusion if used incorrectly.

Task 9: in the sentence “*He (to mend) the car*”, put the verb into different tenses according to the time expressions: twice so far this week, never (they have it mended), when I saw him yesterday (?), right now (-), the day before yesterday, for about 3 hours, for about 3 hours by the time they left, never (it is not his responsibility), yesterday (-), next Wednesday (?), for an hour by the time the training start.

Here are some sample tasks used in the assessments for grammar, vocabulary, and speaking. All of them are focused on error detection.

Task 1: error recognition in radio communication

The objective is to assess ability to notice errors that may cause misinterpretation (rate of speech, stress, grammar, vocabulary). Cadets listen to a short audio of a pilot-ATC communication. The task is to identify the error and write a corrected version.

Example audio transcript:

“Move east seventy meters to the forest. Confirm you hear me.”

Student task is to identify three errors unclear number, ambiguous noun, non-standard phraseology, rewrite the message in concise, standard military English and explain what misunderstanding could occur.

Task 2: listening to international accents (non-visual communications)

Cadets hear messages recorded by speakers with different pronunciation patterns (Ukrainian, Polish, Spanish, Turkish, and English). The task is to identify the key messages, ambiguous parts, potential risk points, and clarify the message using standard phraseology.

Task 3: problem-solving (critical situation analysis)

Cadets receive a short-written incident (real or adapted from military reports). The task is to identify all communication errors made, rank the errors by potential severity, provide a corrected exchange in concise English, and detect the emotional factors that led to the misunderstanding.

Task 4: prediction and anticipation task

Given a description of a combat scenario and a partial radio transcript, cadets must predict what information the commander will likely request next, what miscommunication is most probable, how to pre-empt it with a clarifying message.

Task 5: military simulation video game tasks (voice acting)

Every 5th lesson, cadets play a mission in a military simulation game (FPS or strategy). All actions must be voiced aloud in English. Assessment focuses on clarity, rate of speech, emotional control, ability to paraphrase, ability to issue and receive instructions.

Sample prompts during the simulation:

“Your partner mispronounces a coordinate. Clarify it.”

“You hear interference. Request confirmation using concise communication.”

“Your teammate panics. Slow your speech and stabilize communication.”

Task 6: final simulation game

Cadets are given a complex scenario based on real events: radio interference, ambiguous orders, unexpected threats, need to rank threats by extremeness, limited time, and emotional pressure. The task is to communicate all actions aloud, check/confirm/clarify, summarize, and report after the mission. As an example, we suggest an error-recognition (grammar/vocabulary/listening) rubric, as shown in Table 2.

Table 2. Error-recognition rubric

| Criterion | Excellent | Good | Satisfactory | Poor |
|---|---|---|---|---|
| Error identification | Identifies all errors accurately | Identifies most errors | Identifies some but misses key errors | Fails to identify critical errors |
| Correction accuracy | All corrections precise, concise, unambiguous | Mostly correct, slight ambiguity | Partially correct | Incorrect or unclear |
| Explanation of risk | Clear, linked directly to operational risk | Clear but less detailed | General idea only | No correct explanation |

## 3. RESULTS AND DISCUSSION

Before and after the experiment, a comparative analysis of the groups' academic performance was carried out, as shown in Table 3. According to the most significant indicators, the comparison of academic performance of the CG and EG after the experiment shows that the academic performance in the EG is higher than in the CG. The student's t-test (t=2.92) proves the effectiveness of the developed military English teaching methodology. The mistakes made by cadets in general English test before and after the experiment were analyzed. Table 4 and Figure 4 show significant positive changes in general English performance in the EG after the experiment. It proves that the military English methodology based on the analysis of communication errors provides also a higher level of general English, as an integral part of military English. Both of them are vitally important to avoid misunderstandings that might cause deadly consequences in the military.

The interview in military English with the EG and CG cadets was conducted jointly with the professors of the Military Department to assess the cadets' military English speaking skills, i.e., knowledge of military terminology, pronunciation, accuracy, interaction, comprehension, and fluency. The cadets' language behavior in the CG during the interview revealed increased emotional stress and difficulties in expressing thoughts clearly. The EG cadets' speaking was much more confident, clear, and fluent. They easily paraphrased in case they could not choose the proper word. The occasional hesitation was appropriate and not a sign of searching for words or structures. It was natural and did not cause significant stress. That was the result of applying the communicative approach and military simulation video games with voice acting.

Table 3. Cadets' academic performance in EG and CG before and after the experiment

| Time | Grade point average (GPA) (%) | | General English assessment (%) | | Military English | |
|---|---|---|---|---|---|---|
| | EG | CG | EG | CG | EG | CG |
| Before | 61 | 63 | 59 | 57 | 31 | 29 |
| After | 83 | 70 | 88 | 69 | 93 | 66 |

Table 4. Grammatical mistakes made by cadets in English test before and after the experiment

| Time | Number of cadets (%) who made mistakes related to | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Sentence patterns | | Verb tenses | | Question making | | Confusing word | |
| | EG | CG | EG | CG | EG | CG | EG | CG |
| Before | 63 | 58 | 43 | 54 | 78 | 81 | 39 | 32 |
| After | 48 | 53 | 41 | 57 | 67 | 73 | 18 | 29 |

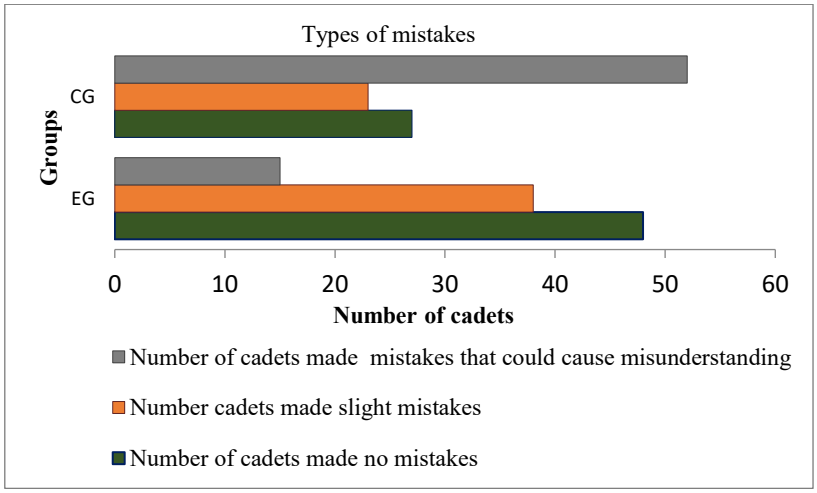


Figure 4. Types of mistakes made by cadets in the final game

Every fifth lesson was held as a military simulation video game with voice acting, representing a simulated professionally-related situation. The difficulty of these activities gradually increased and reached the maximum in the final game. The military simulation video game, during which the cadets voiced all their actions, turned to be effective and motivating. The ability to conduct error-free communication in a stressful situation under the time limit as well as the degree of emotional stability and motivation to complete the task were assessed by a professor of the department of military training. The cadets demonstrated how they can check, confirm and clarify information, and give an immediate, appropriate and informative response.

The most significant stage in evaluating the effectiveness of the developed methodology was the final military simulation video game with voice acting held in CG and EG at the end of the experiment. They were recorded for later analysis that made it possible to assess not only the knowledge, skills and abilities, but also the degree of the cadets' readiness to conduct reliable communication in stressful situations. The final military simulation video game with voice acting, same for CG and EG, simulated the combat operation fragments based on the description of real events with the introduction of various elements of complexity (the occurrence of various unforeseen situations and radio communication interference).

The results of the final military simulation video game with voice acting were analyzed together with the cadets. Everyone expressed and justified their opinion about the mistakes made. The cadets' behavior during the final game, their communication skills and ability to critically analyze mistakes were assessed according to the following parameters: the correctness of the decisions made; motivation to complete the task; emotional stability in the face of stress and time limit; the English proficiency level; the ability to rank information according to the degree of extremeness; the ability to predict the development of the situation and anticipate the consequences; and the ability to assess the correctness of the decision making.

The analysis of the results of the final games showed that majority of cadets in EG completed the task successfully, without mistakes that could cause misunderstanding. Some wrong decisions were made by cadets in CG. They did not cope with the task, as they: incorrectly ranked information according to the degree of extremeness; faced misunderstanding that worsened the situation; ignored the language errors made by other game participants, and, accordingly, did not clarify the information, which could also lead to the development of an unforeseen situation; and could not clearly describe the simulated combat situation.

The cadets' decision-making skills were assessed as "satisfied" or "non-satisfied". We consider it not appropriate to identify the middle level because militants' mistakes can lead to fatal consequences. Special attention was paid to monitoring the level of motivation, since it is the main generalizing component of achieving the intended result and determines the readiness of cadets for professional activities and its success in stressful situations. The criterion for assessing motivation was the goal achievement, as shown in Figure 5.

The behavioral observation showed that cadets in EG, being prepared for possible difficulties and familiar with common language communication problems, remained calm and showed the ability to focus on performing direct professional duties while conducting communications in a non-native language under stress and time limit. The CG cadets could not concentrate and assess the situation and therefore did not have enough time to complete the task and make inadequate decisions, as shown in Figure 6.

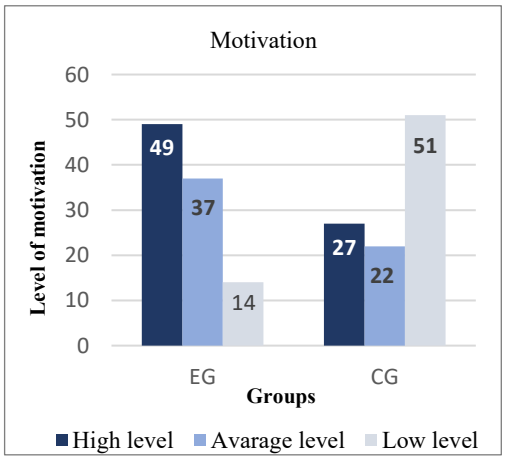


Figure 5. Levels of cadets' motivation during the final game

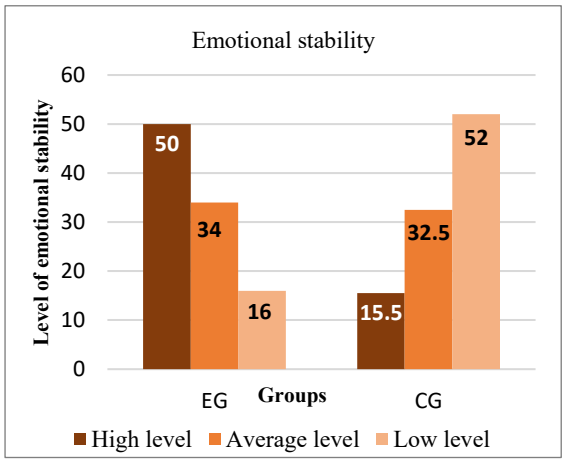


Figure 6. Levels of cadets' emotional stability during the final game

Thus, the comparative analysis of the results of conducting and discussing the final game in terms of the most significant parameters showed that the cadets of the EG were much better prepared and reached a higher level of language proficiency, which would ensure a higher quality of their professional training. The results of teaching in EG in terms of the most significant parameters are higher than in CG. The developed military English teaching methodology not only improved the cadets' performance in general and military English but also revealed a significant increase in professionally important indicators. This is precisely what a systems approach to language teaching, as a subsystem in the system of professional training.

The systems approach is particularly significant for the scientific substantiation of a training methodology as an integral system. This factor is dominant in the development of the structure and content of the training methodology because it connects all the components of the training methodology into a system, and they focus their efforts on obtaining the intended result. The qualities, most suited and conducive for military training, were correlated and identified, as shown in Table 5.

Table 5. Professionally important indicators in CG and EG (%)

| Level | Motivation | | Emotional stability | | Ability to recreate the image of a combat situation on information received in English | | Ability to rank information on the degree of extremeness | | Ability to conduct errorless communication in stressful situation | | Ability to predict development of the situation and anticipate the consequences | | Ability to make non-standard decisions | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | EG | CG | EG | CG | EG | CG | EG | CG | EG | CG | EG | CG | EG | CG |
| High | 50.0 | 27.0 | 49.0 | 15.5 | 55.5 | 37.5 | 50.5 | 28.5 | 52.5 | 36.0 | 61.0 | 27.5 | 61.0 | 35.0 |
| Average | 36.0 | 21.0 | 33.0 | 32.5 | 32.5 | 13.5 | 36.5 | 26.5 | 27.0 | 17.0 | 27.0 | 21.0 | 25.5 | 24.5 |
| Low | 14.0 | 52.0 | 18.0 | 51.0 | 12.0 | 49.0 | 13.0 | 45.0 | 18.5 | 47.0 | 13.0 | 51.5 | 13.5 | 40.5 |

Although the study shows improvements in cadets' communication, emotional stability, and decision-making under simulated stress, further research is needed. The methodology was tested in controlled environments that cannot fully replicate real conditions. Longitudinal designs tracking cadets and active-duty personnel across extended periods and varied operational contexts would contribute to assessments of the durability of stress-resistant communication skills and the transferability of training to field exercises, joint operations, or peacekeeping missions. It would also assess how repeated exposure to cognitive load, fatigue, and cultural diversity affects performance. Retention of EI competencies under sustained operational stress should be monitored, as well as differences in communication reliability across domestic, NATO-aligned, and multinational settings. Long-term career tracking could reveal the influence of trained skills on leadership, decision-making, and operational effectiveness. Such research would strengthen the methodology's evidentiary basis and provide guidance for optimizing curriculum, stress exposure, and EI training. Ultimately, longitudinal studies are essential to ensure that simulated gains translate into real-world operational competence.

Enhancing stress-responsive language training can also be achieved through the integration of AI-driven adaptive learning tools into military English training. It would expand the methodology by introducing adaptive, stress-responsive learning environments. Current training relies on pre-designed simulations and instructor observation; however, AI-driven systems can dynamically adjust task difficulty, linguistic complexity, and stress load in real time based on the learner's performance and emotional state. Integrating such tools would deepen personalization and improve the accuracy of communication training under pressure.

## 4. CONCLUSION

Thus, the results of the experiment showed that the military English teaching methodology contributes to the cadets' ability to reliably apply their communicative skills in such a way that language activity does not interfere with the reliable performance of their professional duties. It will enable militants to overcome the language barrier, reduce the psychological and physiological costs of conducting communication in a non-native language, and free up time reserves for making and implementing reasoned decisions. Furthermore, it facilitates the development of significant personality traits on a professional level, thereby enabling reliable communication as a secondary activity alongside the primary one and potentially saving lives. Prospects of further research are to keep developing teaching materials and strategies that simulate real-world professional scenarios to improve soft skills alongside language proficiency. The upcoming innovations will be used for further improvements of the developed methodology. In our future research, we will consider how to adapt the developed methodology to interprofessional communication training in multilingual, high-stakes environments.

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C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

**CONFLICT OF INTEREST STATEMENT**

Authors state no conflict of interest.

**DATA AVAILABILITY**

The data that support the findings of this study are available from the corresponding author, [TT], upon reasonable request with the permission of the National Aviation University. It was collected through pedagogical experiments at the National Aviation University and Flight Academy (2020–2024), observation of cadets, focus groups, an analysis of communication errors, military simulation video games with voice acting, and language assessments (including NATO STANAG 6001 tests). The data include educational materials, simulation recordings, case analyses, and assessment results collected from cadet training sessions and are not publicly available due to privacy and institutional restrictions.

The data that support the findings of this study are openly available at https://dx.doi.org/10.24093/awej/call9.14 and http://doi.org/10.11591/ijere.v14i1.29806. The data that support the findings of this study will be available in erNAU – Electronic Institutional Repository of the National Aviation University of Ukraine at https://er.nau.edu.ua/home, Institutional repository of Taras Shevchenko National University of Kyiv at https://surl.lu/jzfnlc.

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