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REVIEW ARTICLE

Implementation of Interactive Teaching Methods in the Process of Developing Professional-Communicative Proficiency of Future Pilots

Authors' Contribution:
A – Study design;
B – Data collection;
C – Statistical analysis;
D – Data interpretation;
E – Manuscript preparation;
F – Literature search;
G – Funds collection

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Abstract

Background and Aim of Study: *The research deals with the methods of interactive teaching techniques implementation and their effectiveness assessment during professional language training of future pilots. These techniques are not only aimed to improve language proficiency, but ensure professional expertise and its implementation in the future professional activity. The aim of the study: to define professional language proficiency, to determine and describe interactive teaching methods able to facilitate in developing language skills that meet ICAO language proficiency requirements.*

Material and Methods: *The systematic collection and analysis of all subjective and objective information necessary to define and validate defensible curriculum purposes that satisfy the language learning requirements of students within the context of particular institutions that influence the learning and teaching situation are made. Holistic descriptors and language proficiency assessment scale developed by ICAO are studied. Innovative teaching approaches and methods are studied and implemented. Interactive teaching techniques are implemented and the results are assessed during the training course on Aviation English.*

Results: *Recent studies have proved that methods based on interaction considerably increase students' motivation, willingness to learn, improve and expedite language skills acquisition and facilitate in their successful implementation in real situations.*

Conclusions: *The demands for language proficiency defined by ICAO are not limited by merely knowledge of a set of grammar rules, vocabulary and ways of pronouncing sounds. It is a complex interaction of that knowledge with a number of skills and abilities, which can be developed through interactive teaching methods.*

Keywords: *language proficiency, interactive learning, interactive methods, role play, case study, brainstorming, multimedia learning.*

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Introduction

Lack of plain language proficiency is often cited as a contributing factor in some accidents. While the focus of ICAO language proficiency requirements is on improved aeronautical radiotelephony communications, language also plays a role in cockpit resource management (CRM) and has been cited as a contributing factor in incidents/accidents where miscommunication happened within a flight crew. By meeting language proficiency requirements, flight crews, especially multi-national flight crews, will have the added safety benefit of better CRM (ICAO, 2010). Thus, acquisition of language proficiency for future pilots is considered to be one of the main targets of professional training. Here we should mention the main components of foreign language instruction goals: a) the acquisition of the knowledge of language skills for general communication use; b) exposing learners to other cultures and ideas; and c) fostering an appreciation of differences in cultures and ways of thinking. (Norris, 2006, p. 577). However, future pilots have specific and sometimes immediate language needs that require more than generalized or dispositional knowledge alone since their professional activity involves expertize in a specific area of communication. English for radiotelephony communications as well as Aviation English refer to what is called Language for Specific Purposes. Language for specific purposes (LSP) courses are those in which the methodology, the content, the objectives, the materials, the teaching, and the assessment practices all stem from specific, target language uses based on an identified set of specialized needs. Therefore, the content and focus of the language instruction is narrowed to a specific context or even a particular subset of tasks and skills. Importantly, the context and the people involved (e.g., learners, professionals in the field) drive LSP curriculum –unlike general purposes language instruction, which is often driven by theory alone (Widdowson, 1983). Moreover, in the scope of professional language training, we refer to the term "professional-communicative competence", forming of which is a complicated, long and multifaceted process requiring students' intensive engagement and interaction. Zimnjaja (2003) states that competence – is "an actual, formed personal quality as based on knowledge, intellectual and personally determined social-professional characteristics of an individual, his personal quality".

In order to train a person able to interact within a certain professional sphere, professionalization of study curriculum is required. That means that professional component of education curriculum considers foreign language training as a social process of forming a professional oriented person with sufficient language proficiency. In addition, this describes the specifics of foreign language training curriculum for a specialist capable of information-communication activity in a particular sphere. Efficiency and quality of forming the future pilots' professional-communicative competence depends on the level of consideration and realization of modern requirements in aviation community stated in Manual on the Implementation of ICAO Language Proficiency Requirements. A teacher's role in the language proficiency, that is an inherent part of a professional communication competence, acquisition should also be mentioned. The aim of professional training is to develop the essential CRM qualities, in particular, quick-thinking, decision making, leadership, reaction, attention, long- and short-term memory. Involving interactive teaching methods facilitate in achieving the most essential goals of training future pilots.

Interactive learning is defined as the process of exchanging and sharing of knowledge resources conducive to innovation between an innovator, its suppliers, and/or its clients. It may start with a resource-based argument, which is specified by introducing competing and complementary theoretical arguments, such as the complexity and structuring of innovative activities, and cross-sectorial technological dynamics. It is recognized as the practice of involving learners in the educational process by encouraging them to bring their own experience and knowledge into the process, while also contributing to defining or organizing their learning.

Interactive teaching styles are based on a simple principle: without practical application, students often fail to comprehend the depths of the study material. Interactive teaching is also beneficial for you as the teacher in a number of ways, including: a) measurable student accomplishments; b) flexibility in teaching; c) practice makes perfect; d) student motivation.

The aim of the study. To define professional language proficiency, to determine and describe interactive teaching methods able to facilitate in developing language skills that meet ICAO language proficiency requirements.

Materials and Methods

Interactive teaching methods were studied by national and foreign scientists: Alderson (2005); Angelo and Cross (1993); Bean (1996); Blake and DeVries (2004); Gonzalez (2015); Harwood (2010); Hayes (1989); Jolliffe (1991); Knapen (2018); Mayer (2005, 2009); McGlynn (2001); Melnyk (2017); Melnyk and Pypenko (2017, 2018); Morrison-Shetlar and Marwitz (2001); Nickolaeva and Sopova (2015); Pometun and Pirozhenko (2002, 2004); Reinders and White (2010); Silberman (1996); Trace, Hudson, and Brown (2015); VanGundy (2005); Veen, Lam, and Taconis (1998); Watkins (2005); Yee (2000), and others. ICAO adopted language proficiency requirements and published the ways of their implementation as well as principals of aviation specialists' language training. The effectiveness of implementation of interactive teaching techniques is checked in the process of professional language training for future pilots and preparation aviation specialists for language proficiency testing according to the ICAO scale.

Results

Upon a thorough analysis of the interactive learning styles and techniques and estimated their effectiveness and propriety in the process of professional-communication competence and expertise of future pilots, the following activities have been implemented into the training process:

I. Role plays.

Role play is a technique that allows managing realistic situations and solving realistic problems that can emerge during professional activity through interaction with other people in a managed way with the aim to develop experience and test various strategies in a supported environment.

Depending on the goal of the activity, students can either play the roles they are likely to take possibly in their future professional activity or can play the opposite part in the conversation or interaction. Does not matter which part is taken, they are both effective in achieving significant learning and developing communication skills.

In the other words, role plays are used to allow students to practice speaking in a conversational situation, build confidence and fluency, assess progress, and put learning into action.

Here is the example how to use the technique in the process of teaching Aviation English at the Flight Academy: upon discussing the topic «Fire on board» and the division of duties among the crew, the students are offered to role-play the situation of fire on board whose aim is acquisition fluency, vocabulary and interaction. The cards with the description of a role and instructions, for example:

- The Firefighter (the first cabin crewmember that finds the fire): shall alert the cabin crewmembers, take the nearest appropriate fire extinguisher, immediately locate the source of the fire, extinguish the fire.
- The Communicator (the second cabin crewmember on the scene in charge of the communicating information about the fire) shall inform the flight crew of the following: fire location, fire source, severity/density of fire and/or smoke (color of smoke/odor), firefighting progress, number of fire extinguishers used.
- Cabin Crewmember No. 5 (directly involved in the firefighting effort) shall provide assistance, such as: relocating passengers, providing first-aid, calming and reassuring passengers.
- First Officer shall communicate with the cabin crew members, report the captain about the problem, communicate with ATC – declare the emergency, your position and intention to land at the nearest suitable aerodrome.
- Passenger No. 1 is terribly scared and do not want to follow the cabin crew member's instruction.
- Passenger No. 2 is in panic and screams that everyone will die, etc. are given to the students and upon the command "Fire!" they have to start playing their role. It is recommended to take a video, since it is rather problematic to assess student during the activity. The video can also be used for every student's performance analysis.

Despite some language errors, students' performance demonstrated deep involvement in the activity as well as sufficient knowledge on the topic. Moreover, being asked about the crew's duties and problems the passengers can cause in case of fire on board, the students did not have any difficulties in rendering the information.

II. Brainstorming.

According Cambridge Dictionary (2019) "to brainstorm (of a group of people)" means "to suggest a lot of ideas for a future activity very quickly before considering some of them more carefully".

Brainstorming, as a form of the student-centered learning approach, is the activity that facilitates to generate creative thoughts and ideas. The student-centered learning (Lea, Stephenson, & Troy, 2003) refers to a reflexive approach to the teaching and learning processes for both teacher and learners. SCL is considered to be a process that focuses on deep learning and understanding, since it encourages students to take an active role in the learning process. That is a process wherein a group attempts to find a solution for the specific problem by aggregating all the spontaneous opinions or suggestions given by each group member individually is called as brainstorming. By expressing own ideas and listening to the ideas others express, students make adjustments to their own knowledge or vision, accommodate new information and increase their levels of awareness. This method of teaching is based on the interaction between the teacher and the learner or between the learner and other learner, as this helps in the development of thinking methods.

The key objectives of the brainstorming are to: make students focused on a particular topic, generate and express as many ideas as possible, teach to accept and respect opinions that differ from their own, encourage learners to share their ideas and opinions, demonstrate to students' appreciation and acceptance of their knowledge and their language proficiency, provide students with an opportunity to share ideas and expand their existing knowledge by building on each other's contributions. This type of activity involves mastering the ability to give persuading arguments as well as to express agreement or disagreement, which considerably improves interaction between students.

Generally, the brainstorming is carried on in the following ways:

1. First of all, the group leader/facilitator outlines the problem requiring a decision. The problem is clearly stated such that the members can easily understand it and focus their direct attention on it.
2. Once the problem is defined, the participants are asked to share their opinions through which the problem can be tackled. Here the aim is to get as many ideas as possible; its feasibility is checked later.
3. The participants are required to give away their ideas freely without considering any financial, legal or organizational limitations.
4. The evaluation of ideas is done in the later stage. Therefore, any criticism, judgment, or comment is strictly prohibited during the brainstorming session, and the participants are told not to indulge in these.

The following brainstorming activity can be offered to students during Aviation English classes: Due to the fuel emergency, pilots have to make an emergency landing outside of the aerodrome. Students are given nine pictures of landing sites off the airfield such as a forest, a river, an ocean, ploughed land, a corn field, a motorway, a swamp, a valley surrounded by mountains, etc (Figure 1).

Figure 1. Landing sites for off-field landing.

Students have to rank them from the best one to the worst one, listing the advantages and disadvantages of the terrain types. Prior to commencing the activity, students are offered the expert's opinion concerning the emergency landing and choosing the landing site. Students' performance is assessed due to the following descriptors: fluency, structures, pronunciation, interaction and vocabulary. The willingness to defend own point of view makes students take active part in the discussion.

III. Case-study.

The method of case-study or specific situations is a method of active problem-situation analysis based on learning by addressing specific problems – situations. Particular cases (situations, stories, problems, in other word "case") are used for common analysis, discussion or solving a problem that refers to a definite area of a learned discipline. Case study is applied in the students groups and can be divided into the following stages: the represented analysis of the situation, defining a problem, searching and collecting additional information (if required), discussing various options for solving the problem, choosing the most appropriate solution based on comparing all available options, presentation and defending the resolution.

During learning and comparing different plane types, their technical characteristics, capabilities, advantages and disadvantages, students have to make decision on the following: an airline wants to expand its fleet and is going to purchase five aircraft. The matter of the discussion is which type to choose: Boeing 737 or Airbus 320. The activity is conducted in the form of the Board of Directors meeting. The factors to be compared: the fly-by-wire concept (how much of human factor is involved), passenger capacity, fuel efficiency, cost and availability of maintenance, failures and crashes statistics. I would recommend setting time limits in order to develop students' quick thinking, the ability required for pilots, as well as effective decision-making. While coming to a common decision students demonstrated flexibility and ability to adjust their point of view due to availability of new information.

IV. Multimedia learning.

Multimedia learning is the next innovative method. It is the combination of various media types as texts, images, pictures, audio and video materials using which the information is presented to the learners.

Multimedia learning is a cognitive theory of learning which has been popularized by the work of Mayer (2009) and others.

Mayer (2009, p. 223) identifies the following twelve multimedia instructional principles:

1. Coherence Principle – People learn better when extraneous words, pictures and sounds are excluded rather than included.
2. Signaling Principle – People learn better when cues that highlight the organization of the essential material are added.
3. Redundancy Principle – People learn better from graphics and narration than from graphics, narration and on-screen text.
4. Spatial Contiguity Principle – People learn better when corresponding words and pictures are presented near rather than far from each other on the page or screen.
5. Temporal Contiguity Principle – People learn better when corresponding words and pictures are presented simultaneously rather than successively.
6. Segmenting Principle – People learn better from a multimedia lesson is presented in user-paced segments rather than as a continuous unit.
7. Pre-training Principle – People learn better from a multimedia lesson when they know the names and characteristics of the main concepts.

8. Modality Principle – People learn better from graphics and narrations than from animation and on-screen text.
9. Multimedia Principle – People learn better from words and pictures than from words alone.
10. Personalization Principle – People learn better from multimedia lessons when words are in conversational style rather than formal style.
11. Voice Principle – People learn better when the narration in multimedia lessons is spoken in a friendly human voice rather than a machine voice.
12. Image Principle – People do not necessarily learn better from a multimedia lesson when the speaker's image is added to the screen.

Multimedia learning is effectively used during ESP classes and has proved to be the tool for not only acquiring language proficiency, but a professional competence as well. For instance, discussing aerodynamic movements of the plane it is essential to provide students with images to establish a link between the explanation and the movement itself. It enables them to learn deeper since additional navigation aids are provided (see Figure 2).

All above mentioned methods have been compiled in the study guide "Supplementary complex of interactive lessons on Aviation English" that is currently being practically evaluated during the future aviation specialists training.

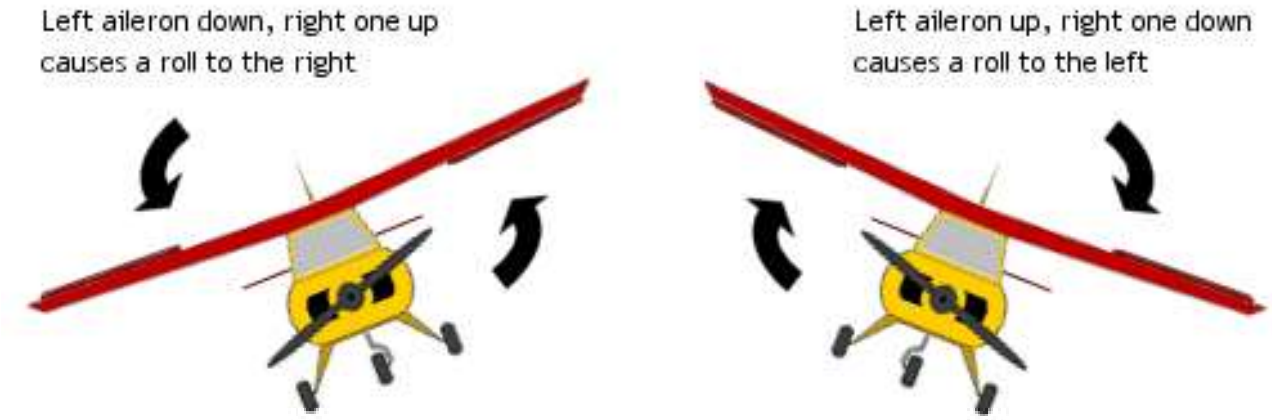

Figure 2. Roll and the way it is controlled.

Discussion

The importance of interactive approach to teaching language as well as any professional knowledge and expertise acquisition cannot be overestimated. Owning to this fact, the issue has been discussed and researched for a long time. A great number of theories as well as practical implementation methods have been appeared.

Veen et al. (1998, pp. 31–39) state that the importance of interactivity lies in the fact that it provides learning dialogue, knowledge presenting structure flexibility and learning activity autonomy.

Yee (2000), the author of interactive techniques, considers interactive methods to be the most effective ones. They involve a collection of more than 100 teaching strategies that aim to engage students in studying process. Most of them encourage the natural acquisition of language, not learning. There is an important distinction between language acquisition and language learning. Children acquire language through a subconscious process during which they do not study grammatical rules. The same as they acquire their first language. Acquiring language, the learner needs a source of natural communication.

According to Blake and DeVries (2004), brainstorming activities that provide a meaningful learning environment in a relaxed atmosphere can be used as one of the strategies to promote speaking skills.

The cognitive theory of multimedia learning (CTML) centers on the idea that learners attempt to build meaningful connections between words and pictures and that they learn more deeply than they could have with words or pictures alone (Mayer, 2009). According to CTML, one of the principle aims of multimedia instruction is to encourage the learner to build a coherent mental representation from the presented material. The learner's job is to make sense of the presented material as an active participant, ultimately constructing new knowledge.

Conclusions

Summarizing everything stated above, the following conclusions can be made: interactive teaching techniques are the powerful tool able to ensure reaching the main goal of learning-teaching process – language and professional skills acquisition. The students are encouraged to be active members of the class, thinking on their own, using their own brains, resulting in long-term memory retention. Not only the students' knowledge will improve, but their interest, strength, team spirit and freedom of expression will increase as well.

Interactive teaching means instructing the students in a way they are actively involved with their own learning process. There are different ways to create an involvement like this: a) teacher-student interaction; b) student-student interaction; c) the use of audio, visuals, video; d) hands-on demonstrations and exercises.

Currently, the research is being conducted as for the interactive methods of teaching advantage in the comparison with traditional teaching methods, where the students of Flight Academy of National Aviation University are involved.

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References

Alderson, J. C. (2005). *Diagnosing foreign language proficiency: The interface between learning and assessment*. New York, NY: Continium.

Angelo, T. A., & Cross, K. P. (1993). *Classroom assessment techniques* (2nd ed.). San Francisco: Jossey-Bass.

Bean, J. C. (1996). *Engaging ideas: The professor's guide to integrating writing, critical thinking, and active learning in the classroom.* San Francisco: Jossey-Bass.

Becta. (2003). *What the research says about interactive whiteboards.* Coventry, UK: British Educational Communications and Technology Agency (Becta).

Blake, M. E., & DeVries, B. A. (2004). *Developing speaking skills. Integrating the language art* (3rd ed.). Scottsdale, AZ: Holcomb Hathaway Publishers.

Brainstorm. (2019). *Cambridge Dictionary.* Retrieved August 10, 2019, from https://dictionary.cambridge.org/dictionary/english/brainstorm

Gonzalez, J. (2015, October 15). The big list of class discussion strategies. *Cult of Pedagogy.* Retrieved from https://www.cultofpedagogy.com

Harwood, N. (Ed.). (2010). *English language teaching materials.* Cambridge University Press.

Hayes, J. R. (1989). *The complete problem solver.* Hillsdale, NJ: Lawrence Erlbaum Associates.

Jolliffe, L. B. (1991). Industry's team approach to classroom projects. *Journalism Educator, 46*(2), 15–24.

Lea, S. J., Stephenson, D., & Troy, J. (2003). Higher education students' attitudes to student-centered learning: Beyond educational bulimia. *Studies in Higher Education, 28*(3), 321–334. doi:10.1080/03075070310000113432

Knapen, R. (2018, June 13). Re: 20 interactive teaching activities for in the interactive classroom [Web log message]. Retrieved from https://www.bookwidgets.com/blog/2018/06/20-interactive-teaching-activities-for-in-the-interactive-classroom

Mayer, R. E. (2009). *Multimedia learning* (2nd ed.). New York: Cambridge University Press. doi:10.1017/CBO9780511811678

Mayer, R. E. (2005). The Cambridge handbook of multimedia learning. In R. E. Mayer (Ed.), *Cognitive theory of multimedia learning* (pp. 31–48). University of California: Santa Barbara.

McGlynn, A. (2001). *Successful beginnings for college teaching.* Madison: Atwood.

Melnyk, Yu. (2017) Study of trends of students' demand for the formation of competences by higher educational institutions. *Science and Education, 5,* 128–134. doi 10.24195/2414-4665-2017-5-22

Melnyk, Y., & Pypenko, I. (2017). Innovative potential of modern specialist: The essence and content. In Yu. B. Melnyk (Ed.), *Psychological and pedagogical problems of modern specialist formation* (pp. 9–16.). Warsaw: ANAGRAM; Kharkiv: KRPOCH. doi:10.26697/9789669726094.2017.9

Melnyk, Yu. B., & Pypenko, I. S. (2018). Training of future specialists in higher education institutions. *International Journal of Science Annals, 1*(1-2), 4–11. doi:10.26697/ijsa.2018.1-2.01

Morrison-Shetlar, A. I., & Marwitz, M. R. (2001). *Teaching creatively: Ideas in action.* Eden Prairie: Outernet.

Nickolaeva, N. I., & Sopova, A. S. (2015). *Formirovanie professionalno-kommunikativnoj kompetentnosti budushhih voennyh letchikov v processe obuchenija aviacionnomu anglijskomu jazyku* [Forming of future pilots' professional-communicative competence in the process of teaching Aviation English]. *Molodoi uchenyi – Young scientist, 13*(93), 675–678. [in Russian]

Norris, J. M. (2006). The why (and how) of assessing student learning outcomes in college foreign language programs. *Modern Language Journal, 90*(4), 590–597. doi:10.1111/j.1540-4781.2006.00466_2.x

Pometun, O., & Pirozhenko, L. (2002). *Interaktyvni tekhnolohii navchannia: Teoriia, dosvid* [Interactive teaching technologies: Theory, experience]: Kyiv: A.P.N. [in Ukrainian]

Pometun, O., & Pirozhenko, L. (2004). *Suchasnij urok. Interaktivni tehnologiï navchannja* [Modern Lesson. Interactive technologies of learning]. Kyiv: Vidavnictvo A. S. K. [in Ukrainian]

Reinders, H., & White, C. (2010). The theory and practice of technology in materials development and task design. In N. Harwood (Ed.), *English Language Teaching Materials: Theory and Practice* (pp. 58–80.). Cambridge: Cambridge University Press.

Silberman, M. (1996). *Active learning: 101 strategies to teach any subject.* Boston: Allyn and Bacon.

Trace, J., Hudson, T., & Brown, J. D. (2015). An overview of language for specific purposes. In J. Trace, T. Hudson, & J. D. Brown (Ed.), *Developing Courses in Languages for Specific Purposes* (pp. 1–23). Honolulu: University of Hawaii.

VanGundy, A. (2005). *101 Activities for teaching creativity and problem solving.* San Francisco: Pfeiffer.

Veen, W., Lam, I., & Taconis, R. (1998). A virtual workshop as a tool for collaboration: towards a model of telematic learning environments. *Computer & Education, 30*(1-2), 31–39

Watkins, R. (2005). *75 e-Learning Activities: Making Online Learning Interactive*. San Francisco: Pfeiffer.

Widdowson, H. G. (1984). *Explorations in applied linguistics 2.* Oxford: Oxford University Press.

Yee, K. (2000). *Language teaching methods*.

Zimnjaja, I. A. (2003). Kljuchevye kompetencii – novaja paradigma rezul'tata obrazovanija [Primary competences – a new paradigm of the education result]. *Vysshee obrazovanie segodnja – Higher Education Today, 5,* pp. 3–10 [in Russian]

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