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CORE SKILLS IN DEVELOPING CRITICAL THINKING IN ESP TEACHING THROUGH SPEAKING AND LISTENING

The article is aimed at exploring the essence and evaluating the values of critical thinking to identify an effective integration of the core skills to facilitate critical thinking ability in teaching ESP to students who major in engineering.

It highlights the significance of critical thinking as an essential skill for modern specialists to enhance their professional competence. Recognized as a higher-order process skill, critical thinking enables individuals to tackle problems thorough analysis, synthesis and evaluation of information, and to consider and assess diverse alternatives.

The authors advocate for incorporating critical thinking skills development within university ESP curricula, particularly through a collaborative approach between language tutors and subject-matter experts. It is stressed that within the context of English for Specific Purposes, the core skills, which critical thinking ability is based on, ensure learners' autonomy, effective argumentation, specific technique application, logical reasoning and self-regulation.

Through analyzing employment trends, industry needs and expert insights, the study identifies the growing importance of critical thinking alongside social skills, content skills and cognitive abilities. An integration of the core skills – interpretation, analysis, evaluation, inference, explanation and self-regulation – is proposed for embedding critical thinking into ESP teaching through a series of speaking and listening tasks and activities aimed at enhancing professional communicative competence.

The paper also presents the instructions that allow students to enhance critical thinking ability due to developing the core skills and illustrates how they affect the process of critical thinking formation providing students with the essential abilities to tackle the complex problem-solving tasks and effective decision-making processes required in the modern engineering workforce.

Key words: *critical thinking (CT), English for Specific Purposes (ESP), core skills, interpretation, analysis, evaluation, inference, explanation, self-regulation.*

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ОСНОВНІ КОМПОНЕНТИ РОЗВИТКУ КРИТИЧНОГО МИСЛЕННЯ У ВИКЛАДАННІ АНГЛІЙСЬКОЇ МОВИ ДЛЯ ПРОФЕСІЙНОГО СПІЛКУВАННЯ ЧЕРЕЗ ГОВОРІННЯ ТА АУДІЮВАННЯ

Метою статті є дослідження сутності та оцінка значення критичного мислення у викладанні англійської мови для професійного спілкування студентам інженерних спеціальностей для визначення ефективного інтегрування ключових компонентів, що сприятимуть розвитку критичного мислення.

Як мислення вищого порядку, критичне мислення дозволяє спеціалісту вирішувати складні проблеми шляхом застосування ретельного аналізу, синтезу та оцінки інформації, а також розпізнання й оцінювання різноманітних альтернатив.

Автори пропонують інтегрувати технології розвитку критичного мислення в університетські навчальні програми, зокрема, за допомогою співробітництва між викладачами іноземних мов та спеціалістами у відповідних галузях. Підкреслюється, що у контексті викладання англійської мови для спеціальних цілей варто урахувати ключові компоненти, що складають основу для розвитку критичного мислення, і таким чином допомагають студентам розвивати самостійність, вміння підбирати ефективні аргументи, застосовувати необхідні техніки розв'язання проблемних ситуацій, логічно розмірковувати та оцінювати ситуацію, робити відповідні висновки.

Аналізуючи тенденції, що відбуваються на світовому ринку праці, потреби галузей та думки експертів, автори відзначають зростаючу роль критичного мислення поряд із соціальними навичками, предметними навичками та когнітивними здібностями. Для впровадження критичного мислення у викладанні англійської мови для професійного спілкування, пропонується інтегрування основних компонентів – інтерпретації, аналізу, оцінювання, висновків, пояснення та саморегуляції – через виконання низки завдань та вправ на говоріння та аудіювання, спрямованих на підвищення професійної комунікативної компетентності.

У статті представлено інструкції, які допомагають студентам розвивати здатність до критичного мислення під час застосування ключових компонентів та ілюструють, як вони впливають на процес формування критичного мислення, забезпечуючи студентів здібностями до вирішення проблемних завдань та прийняття ефективних рішень, необхідних у сучасному інженерному середовищі.

Ключові слова: *критичне мислення (КМ), англійська мова для професійного спілкування (АМПС), ключові навички, інтерпретація, аналіз, оцінка, висновок, пояснення, саморегуляція.*

Problem setting. Dynamic development of the society, intensive processes of globalization and computing, rapidly evolving technologies such as Artificial Intelligence and Machine Learning, 5G Technology, Blockchain and Cryptocurrencies, Augmented Reality and Virtual Reality, Neurotechnology and Robotics require complex forms of thinking that will allow tertiary education students to carry out a comprehensive analysis of the information obtained from a large array of sources, make reasonable judgments and even generate new ideas. That is why critical thinking (CT) is regarded as a basis of the learning process in the modern educational system. CT ability is a vivid indicator of

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the high level of professional competence forming a new model of behavior that can ensure quick orientation, a high degree of adaptation in a particular situation and generation of new ideas.

In recent years, considering the situation in our country, another argument has appeared in favor of realization of CT technology in education, since it becomes a weapon in the information component of the hybrid warfare, which is not easy to resist without proper training (Тягло, 2017: 249).

It becomes obvious that CT must be incorporated into language learning especially English for Specific Purpose (ESP) that allows tutors to induce students to interpret data, invent different ways of solving issues, judge the value of sources and make appropriate choices.

Analysis of recent researches and publications. A great number of scientific works have been devoted to highlighting CT technologies in the tertiary education by both Ukrainian and foreign scholars. Their approaches to CT interpretation had aroused the greatest interest that served as the theoretical basis for this article.

In terms of expert consensus for purposes of educational instruction and assessment, critical thinking is understood "to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based"; it is "thinking that has a purpose (proving a point, interpreting what something means, solving a problem)" (Facione, 2011:14).

In essence, CT is the process of assessing information purposefully and autonomously. It comprises interpretation, analysis, and inference from evidence and reflects on the principles such as conceptually, methodologically and contextually that lead to these judgments. Also, it is not only important in inquiry but also an agent for empowering educational individuals while enhancing their personal and community existence.

Analyzing CT ability as a pedagogical phenomenon, it is proposed a didactic definition of critical thinking, which would allow tutors to design a model of educational process that will result in its development. CT is defined as a separate type of thinking characterized by activity, purposefulness, autonomy, discipline and reflexivity and involves the development of a person's ability to identify problems, analyze, synthesize, evaluate information from any source, put forward alternatives and evaluate them, choose a way to solve a problem or own position on it

and justify own views, make a conscious choice and act (Пометун, 2018:94).

CT needs to be studied and comprehended as one of the essential elements of more complex entities – higher-order thinking, a set of core skills for successful work, etc. (Тягло, 2017). It is seen as a higher-order thinking skill that means an advanced cognitive ability. It is a type of thinking which is more than just basic observation of facts or memorizing things. Having in mind higher-order thinking skills, tutors foster their students to be discerning, creative and innovative.

The researchers advocate for CT as a necessary characteristic of a modern specialist and can be used purposefully for developing professional competence. In this regard, CT allows noticing contradictions, shortcomings, gaps in information, analyzing various sources in a balanced manner, comprehending ones' own position, mastering various strategies of working with information and solving problems. CT technology can be considered an integrating skill, embracing achievements of many technologies, ensuring development of thinking, formation of communication competence and development of autonomous learning skills (Новіков et al, 2021:191-192).

CT is considered to be a resource for formation of the professional competence in the context of complex and synergistic approaches. This involves comprehension of ideas about systematic improvement of process and results of cross-cultural communication activities based on its critical analysis, understanding and evaluation, mind process, aimed at accuracy of statements and validity of reasoning (Петренко, 2023:104).

As stated, CT at the university level has to be taught in the disciplinary contexts through collaboration between language teachers and disciplinary experts that focus more on the contents and meaning-making in academic environment (Bruce, 2020).

The peculiarities of implementing CT technology in professional training have been analyzed and described and, consequently, the target skills and competences that future specialists should master have been distinguished in detail (Омельяненко Н., & Омельяненко С., 2020). It was mentioned that the process of developing thinking skills of future specialists can be incorporated into the course of all academic disciplines, which should be taught in a self-reflection manner, that is, academic disciplines should contain a critical analysis of their own references and cognitive tools.

The key elements of CT in the context of ESP are manifested in the form of autonomy, persuasiveness

of the argument, the usage of certain techniques, that create an effective methodology for processing information, reasonableness (Ковальчук, 2019).

The purpose of the article is to explore the essence and evaluate the values of critical thinking and identify an effective integration of core skills to facilitate CT abilities in teaching ESP to students who major in engineering.

Presentation of the main material. Having analyzed the employment trends in the global market (WEF, 2016) in terms of finding out what skills needs, recruitment trends and occupational requirements are expected to be in great demand in the world. Many industry observers note that the world is on the brink of the Fourth Industrial Revolution, characterized by the convergence of previously autonomous fields like artificial intelligence, machine learning, robotics, nanotechnology, 3D printing, genetics and biotechnology. The job growth in Architecture and Engineering roles, specifically in the Consumer, Information and Communication Technology and Mobility industries is anticipated and a considerable shift in job demands within the engineering sector is expected. Apart from hard skills and formal qualifications, employers prioritize to hire employees with practical skills or competences related to the job enabling them to perform various job tasks successfully and become high-performing employees.

It is anticipated that social skills and process skills (critical thinking and active listening), content skills (ICT literacy and active learning) and cognitive abilities (creativity and mathematical reasoning) will be a growing part of the core skills requirements for many industries. Employees are expected to have more responsibilities related to equipment control and maintenance, and problem-solving skills.

Consequently, critical thinking becomes one of the most desirable competence employers expect from their perspective employees to enable performing specific functions, raise valid, critical questions, be reflective while cooperating with other people, make respective adjustments (Indrasiene et al, 2020).

In regards to the tertiary education, the purpose is to help students better understand their individual abilities and passions, thus, and content should accordingly be personalized (Willingham, 2019:12). Selection of the content that could match future specialists' needs and interests is a critical way that values.

In the context of ESP teaching, there is concern about sequence in which tutors can consider the content specificity of students' majors and the required skills, and decide which skills students will need for the long term.

In this regard, the experts propose matching CT skills with affective dispositions of CT approaches to specific issues, questions or problems to be exercised in an appropriate way (Facione, 2011; Fisher, 2021; Blair, 2021; Heard et al, 2020).

The researchers (Facione, 1998, 2011; Fisher, 2021; Heard et al, 2020; Dessy Laila Kamsinah et al, 2020; Muhammad Eka Putra Ramandha et al, 2018) indicate the five core skills – *interpretation, analysis, evaluation, inference, explanation, self-regulation* – which make the base to develop CT.

Having explored the aforementioned materials and taking into account the essence of CT we found out that the presented combination of the core skills for implementing CT in teaching ESP to the students, who major in engineering, meets the syllabus requirements as well as professional and academic needs of our learners, therefore, let us consider the essential skills to make CT technology effective in teaching English for Specific Purposes. In this article we will focus on implementing the CT skills model to facilitate students' communication competence through speaking and listening activities.

The first component is *interpretation skills,* which are required for being skillful in the higher-level activities, "the stage where students understand and correct meaning" (Dessy Laila Kamsinah et al, 2020:235). They help identify relevant sources, analyze information or situations in a systematic and logical manner understanding the deeper meaning, evaluate assumptions, make sense of information, draw reasonable conclusions and make appropriate decisions, comprehend and express significance of experiences, data, judgements, conventions, beliefs, rules, procedures or criteria. They facilitate such subskills as categorizing information, decoding conventions and clarifying meaning (Facione, 2011; Heard et al, 2020).

To incorporate *interpretation skills* into ESP teaching we can create a wide range of activities.

For encouraging students to master speaking skills with focus on CT we use instructions on recognizing a problem and describing it; constructing, categorizing or organizing ideas related to the topic the students are studying; clarifying and interpreting expressions and ideas, paraphrasing someone's ideas in one's own words; describing and clarifying a sign, symbol, figure, formula, chart or graph; role playing activities: creating scenarios related to professional situations (job interviews, client meetings, workplace interactions) and assigning roles to students; interpreting the context of a conversation or a topic; organizing a specialty-related presentations and follow-up question and sessions to practice interpreting questions and

responding to them appropriately; modeling business meetings, negotiations, team discussions, case studies; practicing active listening for understanding of other people emotions and feelings. This helps our ESP learners practice both speaking and interpreting information in a contextually relevant manner.

It is worth mentioning, while selecting material for listening activities it is crucial to choose authentic and specialty-related podcasts, workshops or webinars for creating instructions: to construct questions while watching audio-visual media and take notes; to identify key concepts; to extract important details; to summarize main ideas; to fill in the blanks or match information interpreting specific details; to listen for details such as statistics, dates or procedures; to share students' interpretations with each other after listening. Such type of activities allows students to develop *interpretation skills* that enable them to recognize, analyze and make sense of different aspects related to their specialty clarifying their essence, defining their limits according to the context and avoiding ambiguity, facilitating subject-subject interaction, sharing thoughts and paraphrasing, encouraging others to express their opinions.

According to the above-mentioned researchers, the second element – *analysis skills* – is aimed "to identify the intended and actual inferential relationships among statements, questions, concepts, descriptions, or other forms of representation intended to express belief, judgment, experiences, reasons, information, or opinions." (Facione, 2011:4); "identify the elements in a reasoned case, its conclusion(s), any assumptions or presuppositions implicit in the case but not expressed, including factual claims, definitions, value judgments, recommendations, explanations, etc. and the intended and actual inferential relationships among sentences and expressions, (etc.)" (Fisher, 2021:18).

Incorporating *analysis skills* to facilitate CT the most effective activities might be: detecting and analyzing arguments to identify their structure, conclusion and logical relations; sorting out irrelevant material; examining ideas; identifying reasons and claims (Heard et al, 2020:6).

While practicing speaking and listening we can present instructions for identifying the similarities and differences between two approaches to the solution of a given problem, constructing conclusions and reasons: to make a comparative analysis of speech patterns to analyze the structure, language features and delivery techniques used in the patterns and compare and contrast effective and ineffective elements; to discuss a specialty-related problem analyzing the issues, expressing opinions, assumptions, or recommendations to solve a problem; to evaluate a speech or presentation analyzing the speaker's effectiveness, considering factors such as body language, vocal variety and use of visuals, discussing the impact of these elements on audience engagement, exploring how cultural differences influence communication styles and analyzing examples of cross-cultural communication challenges in spoken interactions; to listen to/watch an interview with an expert analyzing the conversational strategies, question types and responses; to listen to a debate, discussion or expert opinions on controversial topics analyzing critically the arguments; to listen to a customer service call and analyze the effectiveness of communication strategies in handling a complaint or resolving a problem.

These tasks aim to develop CT abilities such as recognizing a problematic situation; identifying contradictions; selecting arguments; comparing contexts and analyzing their differences.

Focusing on the third element – *evaluation skills* – is critical in language teaching. Students have to be able to evaluate the quality and effectiveness of what they are studying. Evaluation is defined as meaning "to assess the credibility of statements or other representations which are accounts or descriptions of a person's perception, experience, situation, judgment, belief, or opinion; and to assess the logical strength of the actual or intended inferential relationships among statements, descriptions, questions or other forms of representation". (Facione, 2011:5); "making judgments about the relevance, acceptability, credibility or truth, of claims and assumptions" (Fisher, 2021:19); judging the truth of statements, the credibility of sources and the strength/validity of arguments; anticipating objections (Heard et al, 2020:6). They propose activities on comparing the strengths and weaknesses of alternative interpretations, determining the credibility of a source of information, judging if two statements contradict each other, or judging if the evidence at hand supports the conclusion being drawn, judging the logical strength of arguments based on hypothetical situations," (Facione, 2011:5); making judgments about the relevance, acceptability, credibility or truth of claims and assumptions that might be presented in words, graphs, pictures, etc. (Fisher, 2021:19).

The speaking and listening tasks for fostering *evaluation skills* might involve: creating projects on a specialty-related topic to encourage students to work together to solve a problem or achieve a goal; organizing debates to express opposing viewpoints on current issues or topics related to their field of study; role-playing to give instructions, handle customer complaints or participate in a virtual meeting;

participating in a simulated teleconference to assesses students' ability to comprehend spoken information, ask questions and make judgement about the truth of statements, and the validity of arguments; analyzing the content of videos, podcasts, or interviews related to the field of study to identify key points, assess the relevance to the discussed topic, evaluate strength or weakness of arguments; listening to/watching interviews, podcasts or conference presentations, recorded lectures on specific topics to make a summary highlighting the main points and key concepts; participating in information-gap activities where students work cooperatively to complete the missing details and discuss the arguments.

Developing *evaluation skills* through speaking and listening fosters CT skills such as: working with cause and effect relationships, distinguishing between strong and weak arguments, recognizing fallacious arguments, using consciously different criteria, making balanced evaluative judgements.

Considering the fourth element – *inference skills* – with regard to defining *inference* "to identify and secure elements needed to draw reasonable conclusions; to form conjectures and hypotheses; to consider relevant information and to educe the consequences flowing from data, statements, principles, evidence, judgments, beliefs, opinions, concepts, descriptions, questions, or other forms of representation" (Facione, 2011:5; Heard et al., 2020:6). As sub-skills of *inference* the experts list querying evidence, conjecturing alternatives and drawing conclusions (Facione, 2011:5); assess credibility of claims, quality of arguments using inductive and deductive reasoning (Heard et al, 2020:6).

Using *inference skills* as a tool to enhance CT ability through speaking within the ESP context we can design tasks that encourage students to present arguments and draw conclusions, make interpretations and understand implied meanings. Here are some instructions to help incorporate *inference skills* in teaching speaking: to discuss ambiguous statements or situations related to students' professional context to infer possible meanings based on the context; to discuss problems within their professional field to infer possible solutions, strategies or decisions made during the discussion; to discuss a non-verbal situation of workplace interactions to infer meanings and intentions; to present certain facts related to the learned topic deciding on a plan to resolve a problem.

For developing listening competency we can use tape scripts or videos of professional conversations, meetings or interviews to identify information that is not stated explicitly but can be inferred from the context, or speakers express opinions indirectly to infer the speakers' opinions or behaviors discussing the evidence that supports students' inferences; demonstrate technical presentations or lectures on specialty-related topics to infer additional details not mentioned explicitly; create dialogues or monologues with intentional gaps to infer the missing information based on the context and the visible consequences; listen to negotiations to infer motivations, concerns and intentions of the parties involved into the situation.

Such instructions enable our students to develop CT skills: analyzing hidden assumptions, putting forward hypotheses to explain facts, establishing connections, etc.

Another element – *explanation skills* – the experts define as ability "to state the results of one's reasoning; to justify that reasoning in terms of the evidential, conceptual, methodological, criteriological, and contextual considerations upon which one's results were based; and to present one's reasoning in the form of cogent arguments". The sub-skills under explanation are stating results, justifying procedures, and presenting arguments (Facione, 2011:6; Heard et al, 2020:6).

Explanation skills, while being integrated into speaking tasks within ESP context, involve designing instructions that encourage students to articulate concepts, procedures and information clearly and effectively. Here are some patterns to help develop *explanation skills* through speaking and listening:

Speaking: to explain a specific technical process using visuals or diagrams giving clear and step-by-step explanations; to analyze a case study explaining the key aspects, findings and implications, judging the quality; to demonstrate the use of specific equipment related to their major explaining the features, benefits and proper usage; to play the role of a consultant or an advisor explaining recommendations, solutions or strategies to a client or colleague within their professional context; to create and use visual aids (charts, graphs, formulas, slides) explaining a complex concept or the results of a scientific study or experiment, describing the methods and criteria used to achieve those results, showing the reasonableness of findings; to present a research paper related to the specific field designing a graphic display and showing relationship among concepts or ideas, analyzing and explaining the research question, methods, results and conclusions.

Listening: to listen to instructions related to a specific task or technical process, or watch interviews with experts in the specialty-related field for extracting key information and then explaining the steps or details to a peer; after watching a technical

presentation, students have to explain the key points, methodologies and findings, emphasizing clarity and coherence; to listen to the description of a technical process for visualizing and creating a process map or diagram and explaining the steps involved in the process; to listen to expert panel discussions or critical incidents for analyzing different perspectives and explaining the key factors, consequences and arguments.

Explanation skills, in regards to CT, cultivate abilities to identify cause and effect relationships; select arguments; share thoughts, stick to the topic; work with concepts clarifying their essence, giving examples and counterexamples; make a conclusion.

Finally, the last element – *self-regulation* – the experts define to mean "self-consciously to monitor one's cognitive activities, the elements used in those activities, and the results educed, particularly by applying skills in analysis, and evaluation to one's own inferential judgments with a view toward questioning, confirming, validation, or correcting either one's reasoning or one's results". (Facione, 2011:7; Heard et al., 2020:6); the most important skill/disposition/habit of mind is that of applying critical thinking principles and practices to one's own ideas and communications, in writing or speaking, etc. (Fisher, 2021:20). The two sub-skills here are self-examination/self-monitor and self-correction (Facione, 2011:6; Heard et al, 2020:6).

Developing *self-regulation skills* through speaking and listening within the ESP context empowers students to monitor, manage and adjust their own language learning and speaking strategies. Here some patterns: to make records of students' speaking activities and create checklists or rubrics that outline criteria for effective speaking (e.g., clarity, use of vocabulary, fluency, grammar accuracy) to encourage them to assess their own performance identifying strengths and areas for improvement, revise their answers in view of finding errors and create an action plan for enhancement; to role-play professional situations (e.g., client presentation, team meeting) to encourage students to exchange feedback with peers to reflect on how they adapt their communication style with relevance to the performed situation and identify areas for improvement in subsequent tasks.

The demonstrated tasks aim to encourage students to take on responsibilities to monitor and improve their speaking and listening skills. By integrating self-regulation activities, students become more aware of their strengths and weaknesses ensuring CT abilities for continuous improvement of their professional communication competence.

Conclusions. The importance of critical thinking in the context of English for Specific Purposes for engineering students is indisputable. With regard to the impact of interpretation, analysis, evaluation, inference and explanation skills on the process of critical thinking formation, combined with a strong emphasis on self-regulation and through integration of speaking and listening, ESP teaching can significantly enhance students' professional communication competence. By providing students with these essential tools, we prepare them to tackle the complex problem-solving tasks and effective decision-making processes required in the modern engineering workforce.

Encouraging students to critical analysis, clear articulation of ideas and continuous self-assessment not only contributes into immediate academic success but also lay the groundwork for a lifelong ability to adapt and thrive in professional environments.

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