



AN INTERDISCIPLINARY APPROACH TO DEVELOPING COMMUNICATION SKILLS

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Abstract. This material reflects modern educational trends that require an interdisciplinary approach and focus on developing 21st-century skills. The article examines the possibility of integrating various disciplines into the development of individual communicative competencies. It analyzes existing practices, highlights key pedagogical principles, and provides recommendations for building successful communications through an interdisciplinary approach.

Keywords: communicative competencies, foreign language learning, educational applications, interdisciplinary approach, integration of sciences, pedagogical principles.

Introduction

Technological advances have transformed society into a place where people can easily communicate with each other in different languages. Language learning has become an integral part of everyone's life. As a result, developing communication skills has become not only necessary but also indispensable. The concept of language learning and teaching is constantly evolving. Modern language education systems view communication as a crucial indicator of individual success. To cultivate competitive individuals capable of productively solving complex communication problems, the use of an interdisciplinary approach to education has become even more relevant. The integration of disciplines fosters critical thinking and creativity, the ability to quickly respond to problems and find multiple solutions. This is not simply a combination of disciplines but also teamwork, requiring successful relationships.

The symbiosis of knowledge from various disciplines is essential for the development of complex and creative thinking, as well as the ability to adapt to rapidly changing technological conditions, economic, and social changes.

The purpose of this study is to analyze the work of scholars exploring interdisciplinary approaches to education, particularly materials devoted to the use of an interdisciplinary approach in developing individual communication skills. The study also aims to classify methods for integrating sciences into the educational process and evaluate their effectiveness in improving students' communicative competence. The primary goal of this study is to examine effective models, projects, comprehensive strategies, and adaptive methods that can serve as the basis for further transformation of the traditional approach to education with an integrated learning environment.

Methods

To identify the disciplines currently attracting the most attention and the themes that connect them. This study analyzed the content of relevant scientific publications. The review of existing research highlighted key concepts, categories, and points of intersection between disciplines, as well as broader trends and recurring patterns. A content analysis of official educational platforms and existing cases revealed that modern challenges require preparing students who are capable of using language not



only as a tool for communication, knowledge transfer, and accumulation, but also for developing systems thinking and culture, mental flexibility, broad perspectives, and adaptability in a real-world interdisciplinary environment.

Comparing approaches from different sciences to a single problem, as well as comparing the experience of applying interdisciplinary approaches in different fields, such as mathematics, linguistics, and culture, allowed us to identify similarities and differences in knowledge integration methods.

For example, the STEAM concept proposes the integration of subject-based and language learning, which promotes not only the development of language skills but also critical thinking, creativity, and teamwork [5]. One way to implement this approach is to use the method of learning language terminology through subject-based content [11].

Main results of the study

The communicative approach has traditionally served as the foundation of language teaching. When integrating science into the development of individual communicative skills, it is important to consider that oral and written language are similar but distinct systems with specific rules that require different teaching methods. Unlike learning oral language, which is considered spontaneous, written language can only be mastered through specific instruction, such as pre-speech or practice exercises and post-speech exercises.

The STEAM approach promotes the synthesis of science, technology, engineering, art, and mathematics, encouraging innovation and creativity. Practical applications of STEAM include activities such as designing innovative technologies, creating digital artworks, and solving complex problems using mathematical and scientific models.

Beckett and Beckett argued that incorporating the arts into STEM education is essential for developing innovative solutions and stimulating students' interest in science [2].

Therefore, to connect language and mathematics, we can draw the following analogy: in mathematics, formulas define relationships between quantities. Using a mathematical system to develop written and oral language, one can represent and conceptualize everyday situations, including abstract thinking related to hypotheses. In this case, people learn written rules and formulas only after they have mastered the spoken language. It depends on genetics and varies widely between individuals. Although imperfect at the initial level, this base becomes the foundation for improving all components of communicative competence. Communicative competence achieves through culture, which is necessary for the acquisition and use of language. Learning is also possible only when the body and mind work together to process information, given enough motivation and the right input.

Violation of this set of requirements leads to a wide range of limitations, resulting in a person with a limited or insufficient set of skills in one or more areas. Therefore, we should study the relationship between oral language and the codes of written



language and mathematics along two dimensions: the first related to the functional significance of writing, reading, and arithmetic, and the second to their mutual influence at the neurobiological and cognitive levels. Problem-Based Learning (PBL)

Problem-Based Learning (PBL) is a method where students solve a real problem by working together and doing their own research. To find a solution, they draw on knowledge from various fields, which promotes the development of both analytical and synthetic skills. This approach not only improves students' cognitive abilities but also strengthens their interaction and collaboration skills, which are key to effective teamwork in a professional environment [17].

Barrows and Tamblyn described PBL as an approach that encourages independent learning and develops critical problem-solving skills [1].

To achieve success in implementing an interdisciplinary approach, it is also necessary to remember the nature of communication, as participants in a dialogue use various methods (written text, nonverbal means, and spoken language). Thus, tools for establishing and modifying interpersonal relationships come into play.

Integrating Learning: A Collaborative Learning Model

Collaborative learning is an approach that emphasizes student collaboration and the use of interdisciplinary knowledge to solve complex problems. This method promotes the development of critical thinking, creativity, and collaboration, which is especially relevant in the context of digital learning [12].

Project-based learning is an approach that engages students in practical activities that require the application of knowledge from various fields. Here, students not only acquire information but also become active creators of solutions. Learning focuses on real-world problems that must be solved using a variety of skills, including mathematics, science, art, and technology. This type of learning motivates students to approach problems creatively, think critically, collaborate, and find innovative solutions.

Thomas (2000) emphasized that project-based learning (PBL) has a significant positive effect not only on developing students' academic skills but also on improving their social and communication competencies.

Discussion

The analysis of the results obtained in this study highlights the relevance of the interdisciplinary approach as a fundamental axis of contemporary education. In the context of globalization, digitalization, and cultural diversity, the integration of various disciplines enables students to develop broader cognitive, linguistic, and social skills. According to Snow [16], proficiency in academic language forms the basis for a deep understanding of content, while Dalton-Puffer [5] argues that content-language integrated learning (CLIL) promotes a more authentic and meaningful use of knowledge. Both perspectives demonstrate that the connection between language and content is crucial for the development of truly interdisciplinary education.

From a pedagogical perspective, Thomas [17] argues that project-based learning provides an effective framework for knowledge integration, while Dewey [6]



emphasizes the value of active experience in knowledge construction. These ideas align with the cooperative vision of Johnson and Johnson [11], who argue that collaboration and teamwork, supported by technological tools, enhance student autonomy, motivation, and engagement. Taken together, these approaches emphasize that interdisciplinarity is impossible without interaction, dialogue, and the collective construction of learning.

Similarly, motivation and self-regulation are key elements of effective interdisciplinary learning. Dörnyei [7] emphasizes the importance of motivational factors in the educational process, while Nicol and Macfarlane-Dick [14] propose a formative assessment model focused on developing self-regulated learning. Furthermore, Boud and Falchikov [3] raise the need to rethink assessment as a long-term, sustainable formative practice that stimulates reflection and the transfer of knowledge to the real world.

In the field of digital education, Moore [13], Garrison and Anderson [8] suggest models that show how teachers can support interaction and thinking online. Both ideas agree that technology is more than a tool - it is a space for dialogue that helps people work across disciplines and think critically. This latter aspect explored in detail by Paul and Elder [15] and Brookfield [4], who argue that critical thinking is a transversal skill necessary for challenging assumptions, analyzing perspectives, and forming informed judgments. In the context of cultural diversity, the work of Hofstede [10] and Hall [9] allows us to understand how cultural values, forms of communication, and social structures influence interdisciplinary teaching and learning processes.

Therefore, these theories show that an interdisciplinary approach leads to more thoughtful, interactive, and meaningful learning. The combination of collaboration, motivation, formative assessment, critical thinking, and cultural sensitivity forms the basis of an educational model capable of meeting the challenges of the 21st century, where the true purpose of learning becomes the teaching of integration, dialogue, and creativity.

Conclusion

An analysis of the sources demonstrates the high effectiveness of the STEAM approach in language teaching, especially in an environment that is close to real-world tasks. The use of CLIL in STEAM projects promotes increased student motivation, deeper vocabulary development, and the development of functional literacy [11].

The key challenges identified during the analysis were the lack of ready-made materials for integrated practical lessons; the forced choice of a traditional teaching format due to the need for additional training for dual-specialty teachers or professionals to teach tandem lessons; and the need to adapt STEAM assignments to the language proficiency level. However, even simple projects - for example, creating and describing startups, a scientific journal, or a video - can be effective language teaching tools in a STEAM context.

The integration of science in the development of communicative skills opens up new pedagogical possibilities. Widespread implementation requires adapting methods



to specific language goals, as well as creating open resources and templates for integrated lessons with a language component.

One of the most effective approaches to teaching is the integration of language and subject knowledge. Teaching a subject in a foreign language allows students to develop not only their subject knowledge but also their language skills, which in turn helps improve their communicative skills.

Recommendation 1: CLIL (Content and Language Integrated Learning) is a method where students learn subjects in a foreign language. It is one of the best ways to bring language and content together. This allows students to master both specialized vocabulary and general communication skills [16].

Example: Teaching physics in English not only develops knowledge of physics but also improves communication skills in a foreign language, which is important for future professionals working in an international environment [5].

Recommendation 2: The inclusion of cooperative learning methods (e.g., peer-teaching and team-based learning) promotes the development of students' communication skills. These methods require active interaction and the use of specialized vocabulary during group work [11]. Active Learning

Active learning methods, such as project-based learning, game-based learning, and case studies, promote the development of both cognitive and communicative competencies.

Recommendation 3: Incorporating Project-Based Learning (PBL) into the curriculum allows students to actively interact with each other, discuss ideas, and develop solutions collaboratively. These activities contribute to the improvement of not only subject-specific knowledge but also communication and argumentation skills [17].

Example: Students can work on a project related to their future profession, for example, developing a marketing strategy or researching current social issues. This process promotes the development of both subject-specific knowledge and communication skills [6].

Recommendation 4: Interactive tasks, such as role-playing and business simulations, allow students to practice communicating in a variety of situations. This helps them acquire specific vocabulary and learn to argue their point of view in real-life situations [7].

Using Technology in Teaching. Technology offers a wealth of opportunities to enhance the learning process and develop students' communication skills.

Recommendation 5: Using online platforms and virtual classrooms for collaborative learning helps students actively communicate, exchange ideas, and improve both written and oral communication skills. Platforms such as Moodle and Google Classroom allow students to discuss topics and participate in projects in foreign languages, developing their communicative competencies [13].

Recommendation 6: Using webinars and videoconferences with native speakers or experts from other countries helps students learn to communicate in an international context and develop professional communication skills [8].



Developing Critical and Creative Thinking through Language

To develop communication skills, it is essential to develop students' ability to analyze information, express their point of view, and justify their thoughts.

Recommendation 7: Using critical thinking methods in the learning process allows students to develop analytical and communication skills. Students can discuss controversial issues, develop arguments, and develop new ideas through discussions [15].

Example: Students can debate climate change, arguing their position and using scientific terminology, which will help develop both linguistic and cognitive skills [4].

Intercultural Communication

Modern professional work requires students to be able to work in multinational and multilingual teams. It is important to teach students not only the linguistic but also the cultural specifics of communication.

Recommendation 8: Incorporating cross-cultural projects into the learning process helps students develop intercultural communication skills. Students can explore cultural differences and exchange experiences, which contributes to the improvement of their professional and communication skills [10]. Example: Conducting research on different approaches to business or education in different countries can help students understand cultural differences and learn how to interact effectively in an international environment [9].

Regular Feedback and Self-Assessment

Regular feedback and self-assessment methods help students identify strengths and weaknesses in their communication skills, which facilitates their further development.

Recommendation 9: Implementing self-assessment and peer assessment methods allows students to evaluate their work and the work of their colleagues, which contributes to improving self-correction and interaction skills [3].

Example: After delivering a presentation, students can evaluate each other on a number of criteria (argumentation, language use, speech structure), which helps develop both public speaking skills and critical perception of information [14].

Integrating language and subject components into the educational process is an important aspect of developing students' communicative competencies. The use of active learning methods, technology, critical thinking, and intercultural communication helps students develop effective communication skills necessary for successful professional activity in a globalized world.

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