



# Establishing interdisciplinary logical connections at the non-linguistic higher school in the process of the foreign language teaching

## Establecer conexiones lógicas interdisciplinarias en la escuela superior no-lingüística en el proceso de enseñanza de lenguas extranjeras

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#### ABSTRACT:

The article deals with the problems of interdisciplinary communication at a higher university. The purpose of the article is to justify the possibilities of providing interdisciplinary integrative courses at the higher non-linguistic university on the basis of horizontal interdisciplinary logical connections. It is considered to be a relevant approach to teaching foreign languages as Content and Language Integrated Learning (CLIL), which aims to introduce students to new ideas and concepts in traditional curriculum subjects.

**Keywords:** interdisciplinary communication, integrative course, vertical interdisciplinary connections, horizontal interdisciplinary connections.

#### RESUMEN:

El artículo aborda los problemas de comunicación interdisciplinaria en una universidad superior. El propósito del artículo es justificar las posibilidades de proporcionar cursos integrales interdisciplinarios en la universidad superior no lingüística sobre la base de conexiones lógicas interdisciplinarias horizontales. Se considera un enfoque relevante para la enseñanza de idiomas extranjeros como el aprendizaje integrado de contenido y lenguaje (CLIL), que tiene como objetivo presentar a los estudiantes nuevas ideas y conceptos en las asignaturas curriculares tradicionales.

**Palabras clave:** comunicación interdisciplinaria, curso integrador, conexiones verticales interdisciplinarias, conexiones horizontales interdisciplinarias.

## 1. Introduction

One of the main contradictions of higher education is the contradiction between the integrity of the world and the fragmentation of ideas about it in the educational process; between the need to integrate all subjects regarding the final results of university education and the disciplinary form of their teaching. To solve this contradiction is considered to be possible in the context of the integrative educational space of the university through the interconnection of social, humanitarian

and professional blocks of disciplines which would ensure the formation and development of a student's communicative and professional competence, capable of gaining a culture of personal meanings, critical thinking, and self-improvement.

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## 2. Analysis of studies and publications

Problems of interdisciplinary logical connections are considered in many studies (Mirskhulava, 1986; Guryev, 2002; Bulgakova, 2005; Kolonitskaya, 2008), many pages of psychological and pedagogical literature are devoted to the concept of *interdisciplinary communication*, which is defined as the relationship between various academic disciplines (Chernilevsky, 2002), as an integrating element in the system of didactic principles (Guryev, 2002), as a means of communication between the disciplines of various blocks, which is used to form a holistic picture of the world, to intensify the educational, cognitive and creative processes (Kolonitskaya, 2008). In the framework of this study, interdisciplinary communication is considered as a means of logical interconnection between social and humanitarian, general professional and special professional disciplines with the aim of forming and developing reflective interdisciplinary thinking, a broad worldview, and value-semantic attitude to acquired knowledge among students of a non-linguistic university.

Based on pedagogical work experience it can be stated that the foreign language as a discipline is a universal tool for establishing interdisciplinary logical connections in a university. It is precisely in a foreign language class the problem of the contradiction between the fragmentation of disciplinary knowledge and the required final level of systematic training of a future professional can be solved due to the multidimensional and interdisciplinary nature of the content of the discipline "Foreign Language". According to the foreign language teaching strategy adopted at the university the potential of the discipline "Foreign Language" should be used to establish interdisciplinary logical connections and to create an English-language educational environment. Moreover, the implementation of interdisciplinary relations in teaching a foreign language is believed to create a holistic view of language as a means of communication, to broaden the general educational horizons of students, to help better comprehend the content of other disciplines.

In the implementation of interdisciplinary communication, a number of researchers (Vilensky et al., 2005; Kolonitskaya, 2008) distinguish between vertical and horizontal interdisciplinary connections. Vertical interdisciplinary connections are defined as connections between concepts within the same category, which help compile the parts of the course into a logical structure.

Horizontal interdisciplinary connections are interpreted as connections that are causal in nature and suggest a logical continuation of one concept in relation to another (Vilensky et al., 2005).

In the context of the educational process of a non-linguistic university, the vertical interdisciplinary connections are considered to be the multidimensional logical interconnection of social, humanitarian and professional disciplines within one discipline, particularly, within the framework of the "Foreign Language" discipline in order to gain a culture of personal meanings, the formation and development of reflective interdisciplinary thinking, formation of a broad worldview, the formation and strengthening of national identity, recognition of the values of other cultures, artistic vision of the world, the formation of a holistic picture of the world, overcoming conflicts in the professional sphere of communication. When creating integrative courses, the horizontal interdisciplinary connections involve the relationship between different disciplines that are carried out beyond the framework of separate academic disciplines at the level of interaction between different departments of the university with the goal of effectively using the personality-developing potential of the disciplines of the social-humanitarian cycle and professional block of disciplines (Voskovskaya et al., 2019).

The basis for creating horizontal interdisciplinary connections may be considered as a relevant approach to teaching foreign languages as **CLIL** (Content and Language Integrated Learning), which aims to introduce students to new ideas and concepts in traditional curriculum subjects, using the foreign language as the medium of communication (Fernández, 2009; Anyushenkova, 2017).

The skills required for teachers to implement the CLIL approach are different from the skills of teachers for traditional learning foreign languages (Marsh, 1994). In addition to a high level of foreign language proficiency, teachers need to be competent in the field of professional specialization of their students. The most appropriate in our opinion is the creation of integrative courses in collaboration with specialized departments and other departments of the university.

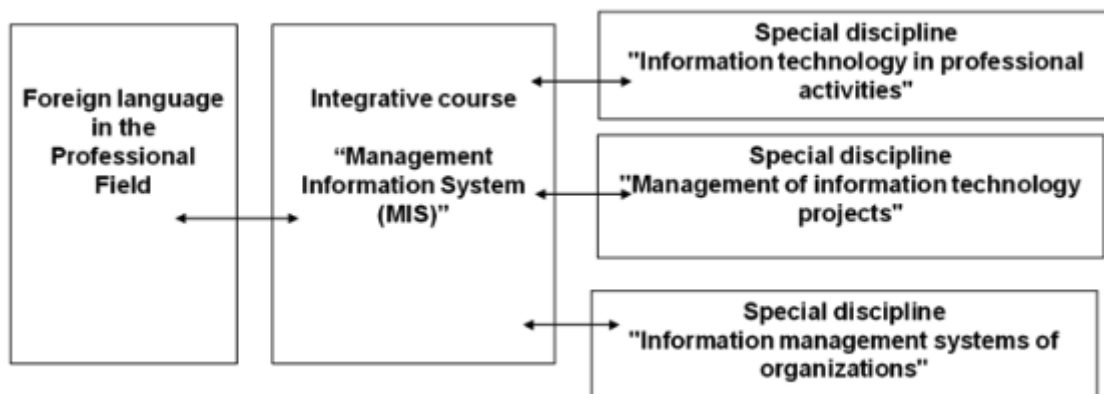
### 3. Methodology

The theoretical and methodological basis of the study was the basic laws, principles and categories of dialectics, pedagogy and psychology; scientific provisions on the role of humanization of education in the harmonious formation of personality and professional activities of a specialist; theoretical conclusions of modern research on the laws and contradictions of the pedagogical process in a university; main provisions of the competency-based approach in education.

### 4. Analysis of results

As part of the CLIL concept and the university's language strategy for establishing interdisciplinary logical horizontal connections between the discipline "Foreign Language in the Professional Field" and special professional disciplines the integrative course "Management Information System" was developed by us (Fig.1).

**Figure 1**  
Horizontal interdisciplinary logical connections in the process of teaching foreign languages in a non-linguistic university (creation of the integrative course)



The purpose of the experimental integrative course was to study the possibility of increasing the level of academic performance, the level of motivation to study specialized subjects in a foreign language and increasing the level of professional motivation. This integrative course was organized as an experimental study of the discipline "Foreign Language in the Professional Field" for the 3rd year students together with the teachers of the Faculty of Applied Mathematics and Information Technology. In the process of developing this course, educational and methodological materials have been compiled and systematized, and on its basis the textbook was written and published (Melnichuk et al., 2018); an interactive version of the textbook was also created (Arevkina et al., 2017).

And as a result, the integrative course included the following aspects:

- assimilation of terminological English-Russian and Russian-English glossary on the topics;
- interpretation of highly specialized technical and economical texts from authentic sources devoted to the development of management information systems;
- independent work of the students with the interactive textbook containing additional information on the content of the integrative course, involving the revitalization of lexical and grammatical didactic material, and checking up not only the terms on the topics but also and information material devoted to the professional aspects;
- creation of discussion clubs to exchange the ideas on a number of issues relevant to future specialists;
- role playing in a form of the scientific conference devoted to different issues of MIS;
- including in the list of exam issues and differentiated tests for professional disciplines the issues for which the only source of information was highly specialized texts in English, the content of discussion clubs, role-playing games.

Experimental training was carried out in three stages:

- creating two experimental and two control groups of 19 students each to ensure the purity of the experiment. In total, 76 students took part in the study; developing an integrative course program and publishing a textbook;

- training in experimental groups on the developed integrative course, with lectures in English on specialized subjects, as well as seminars followed by the organization of a scientific and practical conference at which students presented their projects, while in the control groups, foreign language training was conducted according to the traditional program without involving teachers of specialized disciplines;
- performing tests by the students of experimental and control groups, the purpose of which was to determine the level of motivation of students to study specialized disciplines in a foreign language, as well as the level of their professional motivation; students were asked to take tests on the level of performance in specialized disciplines and on the level of proficiency in professional English.

We have determined the success indicators of the experimental integrative course in accordance with its goal: motivation to study special disciplines in a foreign language; professional motivation; academic performance in special disciplines; academic performance in the discipline "Foreign Language in the Professional Field". Each indicator was divided into three levels:

- high level (100-85 points according to the test results): the student showed a deep interest and enthusiasm in the process of studying foreign sources of information devoted to professional issues, successfully analyzed the solution of professional problems in a foreign language, realized the need for further self-improvement and a deeper study of issues in this area with the help of a foreign language;
- intermediate level (84-55 points): the student thoroughly studied the material offered to him in a foreign language, showed a certain interest, but preferred to discuss the solution of professional issues in his native language, was not sure that he needed further study of a special discipline in a foreign language;
- low level (54-10 points and less): the student was reluctant to attend classes at the integrative course, did not participate in the discussion of professional issues in a foreign language, did not consider it necessary to study special disciplines in a foreign language in the future.

It should be noted that by professional motivation, we consider the student's desire to continue working in the specialty received at the university and the desire to achieve success in the chosen professional activity. Professional motivation is also may be defined according to the three levels:

- high level: the student is completely satisfied with the chosen specialty, plans to work in this area in the future and is distinguished by his determination to achieve the set goals, considering even the learning environment as an opportunity to show his competitiveness;
- intermediate level: the student is completely satisfied with the knowledge gained at the university, he would like to build his career in his chosen professional field, but he is also not confident in his capabilities;
- low level: the student shows little interest in the disciplines associated with his future professional activities, considers the possibility of moving to another area.

Academic performance in special disciplines and a foreign language is determined by us in accordance with the point-rating system developed at the university which has three levels: a high level – from 100 to 86 points in the final test in the special discipline and in the discipline "Foreign Language in Professional Field"; the average level – from 86 to 70 points; the low level – from 69 to 10 points.

According to the results of tests and questionnaires, the following results were obtained, which are presented in Table 1. The table shows the number of students who, according to the test results, showed a correspondingly high, intermediate, and low level of manifestation of each indicator. It should be noted that initially, according to the Oxford placement test, the participants in the experiment had a foreign language level of at least B1, and also had an average academic score of at least 70 points.

**Table 1**  
Results of experimental integrative course  
"Management Information System"

Success indicators	Experimental groups			Control groups		
	38 students			38 students		
	high	intermediate	low	high	intermediate	low
Motivation to study special	19 50.0 %	17 44.7 %	2 5.2 %	14 36.8%	16 42.1%	8 21.1%
Professional motivation	21 55.3%	12 31.6%	5 13.2%	15 39.5%	14 36.8%	9 23.7%
Academic performance in	24 63.2%	12 31.6%	2 5.2%	18 47.4%	16 42.1%	4 10.5%
Academic performance in the discipline	17 44.7%	16 42.1%	5 13.2%	12 31.6%	18 47.4%	8 21.1%

As it can be seen from the above table, students of the experimental groups showed higher results for all four indicators, compared with the students in the control groups.

## 5. Conclusion

Based on the results of the experiment, we can conclude that the organization of such integrative courses with the active interaction of various departments of the university is quite advisable and can be quite effective. Thus, the actualization of interdisciplinary connections in a non-linguistic university, being one of the means of interconnection of the educational process, has a positive effect on the formation of students' professional competence. We should strive to ensure that modern education promotes the student's knowledge, including the reality he creates, and such knowledge is impossible without a meaningful polylogue of all disciplines in the learning process.

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