Learning leading technologies in the epoch of digitalization on the example of CLIL

Elina Kalinichenko
Department of Economics and Management
Saratov State Vavilov Agrarian University
Teatralnaya square 1, 410012 Saratov
Russian Federation
e-mail: kalina2000anna@yandex.ru

Svetlana Zakharova
Department of Economics and Management
Saratov State Vavilov Agrarian University
Teatralnaya square 1, 410012 Saratov
Russian Federation
e-mail:s.zakharova77@gmail.com

Marina Razdobarova
Department of Economics and Management
Saratov State Vavilov Agrarian University
Teatralnaya square 1, 410012 Saratov
Russian Federation
e-mail: mar-razdobarova2009@yandex.ru

Abstract Effectiveness of modern teaching methods and technologies is determined not only by their innovation, but also by the teachers who impersonate the leaders and who apply these technologies in learning process. Our study confirms positive dynamics in disciplines "Foreign language" and "Economy" by the application of modern integrated and digital technologies.
Our results of the analysis of learning effectiveness proved that the students of group A (experimental group) who were studying with the help of content-language integrated learning (CLIL) and software "Dialogue Nibelung" had better knowledge of these subjects. Moreover, the students of group B (control group) who were studying with the help of traditional technologies, showed lower results. Overall, it appears that an optimal set of the above methods and technologies can be provided by a teacher/leader who can identify and transform technologies according to the conditions of integrated learning. We argue that the teacher is capable of combining contents of different disciplines where the foreign language methods are applied as additional means for leading professional subjects learning.

1 Introduction

In the framework of the new paradigm of educational process aimed at the competent specialist formation, and subsequently a professional who is able to effective activity at the level of world standards, education should have a special, innovative development. In another words, it aims at creating leaders (Gunter 2004; Danielson 2007; Razik et al. 2010; Crevani 2018). One of the ways to modernize education is the application of modern pedagogical technologies in learning process. This means that the traditional technology of professional education should be supplemented with new methods of interaction between teachers and students, based on the laws of cognitive activity and ensuring effective achievement of learning outcomes.

Within the competency-based approach in order to develop foreign-language communicative competence, the most relevant way is the inclusion of modern information technology. It helps to organize the educational process as a promising educational environment, to form and develop the students' communicative competence in foreign language.

Let us analyse the term "information technologies". Nowadays, in some cases, information technologies are understood as a set of interrelated sciences (Dendev 2013), in others as a set of knowledge about the ways and means of working with information resources, the third sources define information technologies as the order of collecting, processing and issuing information.

Intensive information processes in the present time affect all spheres of society, including education. The issues of IT development in academic research are covered by such authors as Vagramenko (2000), Branovskiy

(1995), Bush (2008), Gein (2009), or Robert (2010). These technologies include all resources required for information management, intensive use of personal computers as a means of transmitting and processing information and various types of telecommunication in education has identified the concept of "new information technology". As the term "information" includes computer and telecommunication resources, then sharing the opinion of such authors as Vagramenko (2000), Branovskiy (1995), Gein (2009), Robert (2010), we will use this term for all categories of these technologies.

The contribution of such scientists as Gartsov (2007), Sysoev (2008) should be noted. They examined the issues and problems of modern information technology introduction in the process of teaching foreign languages, in particular, the problems of speech activities development, the formation of language aspects, socio-cultural and intercultural competences. In this article, we understand information technology as a set of interactive processes, software and technology means used to obtain, communicate, exchange, transform, manage, store information, allowing to combine traditional forms with distance and contributing to the creation of a virtual educational environment. That is, the use of this technology in the educational process can be represented as a process of computer organization of the educational environment, aimed at the optimal development of foreign language communication.

2 Dialogue Nibelung as an interactive multimedia environment

Modern information technology provides teachers with a wide set of opportunities for educational activities. It gives them more opportunities and makes them act in different way, as leaders. Nowadays more and more often specialists are faced with the question of developing virtual educational environments for higher educational institutions. Various software programs are being created as a base for such developments in many institutes and universities. Virtual educational environment plays a significant role in a non-linguistic institution, namely its component - a virtual multimedia learning environment.

The main components of such environment in a modern higher education institution can be: a virtual media library with multimedia modules for teaching foreign language communication; a music library containing authentic audio files in a foreign language; a virtual video library containing authentic films in various formats; a virtual library of electronic portfolios, textbooks, materials and projects.

With the software "Dialogue Nibelung" in Saratov state agrarian university there is an opportunity to transform the computer room into an interactive multimedia environment and a language laboratory. This software allows the teacher to make the most of the time and to influence positively on the learning process; enrich the teaching process with multimedia content without the need for additional equipment; provide students with more material to study and expand the choice of materials for independent work (including through the controlled use of Internet pages); students to communicate freely with the teacher without disturbing others; provide the teacher with the necessary tools for effective interactive communication with students (transmission of short messages, chat sessions, listening, dialogue).

The possibilities of this system can be used by the teacher at all stages of the lesson. For example, in the process of checking homework, if a student has prepared a report or wants to demonstrate the results of his work, the screen is transferred to all other students, which allows you to get acquainted with the written in detail, and with the help of existing "pen" you can highlight particularly important points.

At the stage of updating the knowledge can be used chat function. This type of interaction allows you to write and translate phrases, answer questions. This work can be done both individually and in a group. The teacher unites students in groups and each of them carries out the task.

The software also allows you to work with files and media sources. These features involve the use of audio and video materials, but with some features. When transferring audio and video through media sources, the material is quickly transferred to students ' computers, but it is possible to listen or view it only once, which does not always lead to the desired result. Not all students can make sense of what was said the first time and do the job. Much more effective, in this regard, is to work with files. In this case, each student receives a file and works with it in the desired mode and with individual speed. He can listen to or view the material several times, stop, go back. Since all students have headphones, they do not interfere with each other. As a result of this work the control group listening and viewing from the big screen of the TV which is established in audience is carried out, completely displays the Central computer of the teacher and gives the chance to reproduce a sound and the image on all audience. Students also look at the presentation and perform the various jobs that fulfil the reading, listening and repeating after the speaker of the phrase based on the text. This is a very valuable use of this system, allowing everyone to work at their own pace. The only drawback of using video files is that they are not downloaded immediately, so the teacher needs to take care of this in advance.

In the context of modern language education is very important such software function as voice recording. For a foreign language teacher, it is an opportunity to prepare students for oral speech, to teach them how to pronounce words and make statements. This function also allows you to compare your pronunciation with that of a native speaker, which helps to improve the phonetic level of students. This type of work is also

effective for training the skill of a monolog without prior preparation. The teacher can also then collect voice recordings, analyse and evaluate them. It saves a lot of time in the classroom, as the teacher can listen to audio files at any time. It is important to note that the teacher can pair students and record their dialogue or talk to the student using the dialogue function. It is very effective to implement the communicative orientation of foreign language teaching.

A component of the Dialogue Nibelung system is the test designer - a special application for creating and editing tests, conducting tests and analysing the results. In the test questions can be used images, audio and video materials, Internet files. The teacher has the ability to create tests that contain different types of tasks: select one or more correct answers, insert missing words, set a match, arrange in the specified order, record a voice response. The software also allows you to limit the response time for each question or the entire test, mark the complexity of the question in points and set the maximum score. In order to conduct a reflection at the end of the lesson, the test designer helps the teacher to evaluate the results obtained during one or more sessions. It should be noted that students immediately see their results on the screen, their mistakes and perceive the assessment as the most objective.

The system also provides homework for independent work at home, and then collection of files prepared by students. The task can be given to a group or individually, according to the level of each student, which provides an individual approach and contributes to a more intensive learning of the language. Information about who and when received and passed the task is stored on a central computer, so that the teacher can follow the dynamics in material assimilation. Each teacher has a personal folder with an electronic journal, where he / she marks the participants, gives grades and looks through the statistics of attendance and progress in the database.

In general, the software Dialogue Nibelung allows the most extensive use of information technology resources in the process of foreign language learning, to create a virtual multimedia learning environment, which contributes to the effective formation of foreign language communicative competence.

3 CLIL is an effective method for leaders

In today’s Russia, no one needs to prove the fact of intensive foreign language learning at school and university. This is fixed at the level of state standards. For example, in the process of studying the discipline "Business foreign language" student (undergraduate) of 38.04.01 Economics should form the following general professional competence: "readiness for communication in oral and written forms in Russian and foreign languages to solve the problems of professional activity" (GPC-1). In order to solve this problem at the Saratov State Agrarian University named after N. I. Vavilov, we apply new educational technology, i.e. the so-called integrated learning with elements of CLIL (content-language integrated learning, subject-language integrated learning) based on the software "Dialogue Nibelung".

Elaborated information environment allows to expand educational opportunities, to expand geographical, historical and cultural borders. But most importantly, in our opinion, it is also an opportunity to keep up with the times, to keep up with the informationally "advanced" students who "bring" to the university informatization and digitalization in personal smartphones, tablets, etc. Teachers, using information technology, not only begin to "speak the same language" with students, but also under the guidance of the leader -a huge, chaotic flow of information becomes systematic. Using proper monitoring of all network capabilities, semantic and content control by the leader, the Internet ceases to be the ultimate truth.

Let us turn to our experience. In foreign language classes using the software "Dialogue Nibelung", at the stage of knowledge updating we use the chat function. This type of interaction allows you to write and translate phrases, answer questions. This work can be done both individually and in a group. The teacher unites students in groups and each of them carries out the task. When you pin new material, the program also allows you to work with files and media sources. Much more effective, in this regard, is to work with files. In this case, each student receives a file and works with it in the desired mode and with individual speed. She or he can listen to or view the material several times, stop, go back. Since all students have headphones, they do not interfere with each other. As a result of this work the control group listening and viewing from the big screen of the TV which is established in audience is carried out, completely displays the central computer of the teacher and gives the chance to reproduce a sound and the image on all audience.

In the process of learning, one can also apply an integrative approach, i.e. simultaneously study a complex section of professional discipline and a foreign language, in this case English. Thus, English acts as a tool for learning another discipline.

In the beginning of the teaching process, we give the basic knowledge about the discussed material. The key words are in bold or italics. In the tasks there is illustrative material for simplification. The study of the levels of formation of general cultural and professional competencies of the first-year students of bachelor's degree in Economics of Saratov State Agrarian University demonstrated insufficient knowledge and skills in the disciplines (business foreign language and economic theory). This made us refer to the pedagogical experience of foreign countries (EU) using the innovative integrated approach of CLIL at all levels of education.

4 Some practical examples

The results of the control and evaluation tasks after a series of practical integrated classes in the group showed positive dynamics in the development and formation of the studied competencies. We find CLIL techniques and methods effective and promising in teaching a foreign language and professional disciplines at the university.

Table 1. Levels of formation of general professional competence of students (in %)

Levels of formation	Group A (experimental)	Group B (control)
Elementary	10,2	48,4
Optimal	60,2	43,6
Advanced	29,3	8

Source: Kalinichenko et al. (2018)

The analysis of our results reported in Table 1 shows that the students of the experimental groups had positive changes regarding the formation of both general professional competence and professional subject. Thus, almost a third of students have an advanced level, the optimal level is 60%, and only 10-11% of the level corresponds to the elementary one. In the control groups in the process of traditional education there are minor positive changes: 48% of students have an elementary level of formation, 44% -optimal and only 8% of students showed the advanced level of formation of this competence.

An example is the topic "History of Economic Thought" on the subject “Economic Theory”. First of all, an information about passive voice in English is provided in the form of a table with examples (see Table 2).

Table 2: Unit 5. “History of economic thought”

Simple, Continuous and Perfect Tenses in the Passive Voice

Aspect	Present	Past	Future
Simple	The article **is translated** by the student.	The article **was translated** by the student yesterday.	The article **will be translated** by the student.
Continuous	The article **is being translated** by the student now.	The article **was being translated** by the student all the evening yesterday.	
Perfect	The article **has been translated** by the student today.	The article **had been translated** by the student by the previous lesson.	The article **will have been translated** by the student by the next lesson.

Source: Own results

Here, some of the examples might be presented and commented in detail:

Ex. 1.1 Read the text. Find the examples of Passive Voice in this text.
Economics *is a social science that studies the production, distribution, and consumption of goods and services. Economics focuses on the behaviour and interactions of economic agents and the way how economies work. Microeconomics analyse basic elements in the economy, including individual agents and markets, their interactions, and the outcomes of interactions. Individual agents may include, for example, households, firms, buyers, and sellers. Macroeconomics analyses the entire economy (meaning aggregated production, consumption, savings, and investment) and issues affecting it, including unemployment of resources (labour, capital, and land), inflation, economic growth, and the public policies that address these issues (monetary, fiscal, and other policies). The discipline was renamed in the late 19th century, primarily due to Alfred Marshall, from "political economy" to "economics" as a shorter term for "economic science". At that time, it became more open to rigorous thinking and made increased use of mathematics, which helped support efforts to have it accepted as a science and as a separate discipline outside of political science and other social sciences. There are a variety of modern definitions of economics; some reflect evolving views of the subject or different views among economists. Scottish philosopher Adam Smith (1776) defined what was then called political economy as "an inquiry into the nature and causes of the wealth of nations".*
Ex. 1.2 Give the definition of the underlined words and words combinations from the example
Example: *Social science is a category of academic disciplines, concerned with society and the relationships among individuals within a society. Social science as a whole has many branches.*

Ex. 1.3 Provide the definition of the following terms in English: markets, production, cost, supply and demand, firms, growth, business cycle, unemployment, inflation, monetary policy.

As one can see, the examples are comprehensive and helpful. They help to improve the students' economic English vocabulary and help them to shape up their knowledge and command of English for economists.

5 Conclusions

All in all, even with a few examples of CLIL presented above, one might comprehend and understand the need for cooperation between the two areas of language and professional subject. It becomes clear how effective it is possible to study professional subjects with an integrated approach. The results of our paper show that such integrated method has a positive impact on both the subject area and the language. Although we note high complexity of such integrated course.

Moreover, we demonstrate that the role of the lecturer (or an instructor) is also indispensable in this process. It is very important to combine the technology with human interaction in shaping up the future self-confident and professional leaders.

Summarizing all the above, we can stress that we find it necessary to introduce new competencies for the teacher in order to adapt to the digitalization of education and further digital orientation which allows to implement the learning process in higher education effectively and in a more efficient way.

References

Branovskiy YS, Introduction to teaching computer science. 1st edn. (Samara, Publishing house of Samara State Pedagogical University, 1995), 206 p.

Bush T (2008) From management to leadership: semantic or meaningful change? Educational Management, Administration and Leadership 36(2):271–288. doi: 10.1177/1741143207087777

Danielson C (2007) The many faces of leadership. Educational Leadership 65(1):14-19. doi: 10.1002/lia.4070140108

Crevani L (2018) Is there leadership in a fluid world? Exploring the ongoing production of direction in organizing. Leadership 14(1):83-109. doi: 10.1177/1742715015616667

Dendev B (2013) Information and communication technologies in education. The UNESCO Institute for information technology in education. http://iite.unesco.org/pics/publications/ru/files/3214728.pdf. Accessed 25 April 2019

Gartsov A, Tools of information technology in the practice of teaching and learning language at the higher school, 1st edn (ZAO "Eco-inform", 2007), 173 p.

Gein AG, Computer science and information technology: Volume for teacher, 1st edn. (Moscow: Education, 2009), 224 p.

Gunter H (2004) Labels and labelling in the field of educational leadership. Discourse: Studies in the Cultural Politics of Education 25(1):21–41

Kalinichenko EB, Ivanova LM, Razdobarova MN, Lanina AV (2018) The European Proceedings of Social & Behavioural Sciences EpSBS. https://www.futureacademy.org.uk/publication/EpSBS/SCT2018/ Accessed 20 Feb 2019

Razik TA, Swanson AD, Fundamental Concepts of Educational Leadership and Management, 3rd edn. (New York: Allyn & Bacon. Pearson, 2010), 432p.

Robert IV, Modern information technologies in education: didactic problems, prospects of performance, 1st edn. (RAO, 2010), 140 p.

Sysoev PV, Foreign language multicultural education: theory and practice (M: Moscow, 2008), 389 p.

Vagramenko JA (2000) Information technology and modernization of education. Pedagogical Informatics 2:3-10.