

Секція 6. ІНФОРМАЦІЙНІ ТЕХНОЛОГІЇ В НАУЦІ ТА НАВЧАЛЬНОМУ ПРОЦЕСІ

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ОРГАНІЗАЦІЯ МЕРЕЖЕВОЇ ВЗАЄМОДІЇ В НАВЧАЛЬНОМУ ПРОЦЕСІ

С.М. Губський, В.О. Віннікова, В.М. Кобрін

Розглянуто аспекти впровадження та організації мережової взаємодії в навчальному процесі як необхідну умову сучасної якісної освіти. Наведено результати застосування технології Вікі в процесі викладання хімічних та спеціалізованих дисциплін університету, а також показано переваги впровадження для кожної із сторін цієї взаємодії.

Ключові слова: навчальний процес, мережева взаємодія, Веб 2.0, Вікі.

ОРГАНИЗАЦИЯ СЕТЕВОГО ВЗАИМОДЕЙСТВИЯ В УЧЕБНОМ ПРОЦЕССЕ

С.М. Губский, В.А. Винникова, В.М. Кобрин

Рассмотрены аспекты внедрения и организации сетевого взаимодействия в учебный процесс как условие современного качественного образования. Приведены примеры использования технологии Вики в процессе изучения химических и специализированных дисциплин университета, а также показаны преимущества внедрения для участников взаимодействия.

Ключевые слова: учебный процесс, сетевое взаимодействие, социальная сеть, Веб 2.0, Вики.

ORGANIZATION OF NETWORK INTERACTION IN EDUCATIONAL PROCESS

S. Gubsky, V. Vinnikova, V. Kobrin

The problems of network organization and implementation to education as a necessary element of ICT (information and communication technologies) are discussed. The necessity for such a step for the evaluation of education according to modern trends and standards as UNESCO Education for the 21st Century and TRACK approach are showed. As an example, practical steps of using technology for Wiki specialized subjects explored in various departments of Kharkov State University of Food Technology and Trade are presented. As a result, the network interaction in teaching process was given the benefits for both teachers and students. Modern trends of academic process development in the direction of introducing information and communication technologies are analyzed. This allowed to substantiate the necessity of organizing network interaction in the

academic process as a factor for raising its quality. The use of modern wiki technologies along with traditional forms of education allows to enhance the effectiveness of educational process by such factors as cooperation, individual student activity and the process of self-control electronic content development.

Keywords: *educational process, network interaction, Web 2.0, Wiki.*

Introduction. Comprehensive implementation of ICT is one the newest attributes of the educational process. This technology helps to transform informational resources into educational resources, which provide better performance in students’ training. This paradigm can be considered as the best approach in the conditions of modern society, such as changing in current economic situations, implementations of the newest technologies, e-learning and future-skills development. All of the above encourages us to the creation of virtual economy based on the association of social cooperation with a cloud, mobile and informational technologies (Internet). Its main idea is to join virtual world with real life. The upraise of permanent IT-factor in business, where an average employee is taken as IT-user with the required skills is the demand of current economy. Another aspect of the implementation includes changes from hierarchical and centralized business models to a wider cooperation net inside the business. Computer communications form a new field of informational culture, which takes “networking” logic as a background for further impact on the results of business processes in every-day life.

Economic factors influence changes in the educational processes in the 21st century (Table) [1]. For students it adds creativity in education, being based on a project creation, rather than absorbing the information, which the student is full of. The teacher should both convey the knowledge according to the curriculum and provide with vitally important communication and interpersonal skills including communication via Internet for the maintenance of a student creative standpoint.

Table

The change of the teacher’s role in the learning process

	20th Century	21st Century
Teacher	Delivery of content and information (it is assumed that learning is a reflex of teaching)	Guiding students’ process of creating intellectual outcomes (ideas, understandings, knowledge, methods, processes)
Student	Content and information consumption (reflects back information)	Deep grasp of underlying concepts, systems, theories, connections, potentials

All the above cannot be done without implementing new progressive methods of teaching. Firstly, this is an effective usage in the learning ICT process, which has to be joined with the traditional pedagogical components and professional content in the most organic way. These components' combination is called TPACK (Technological Pedagogical Content Knowledge) and is used by one of the most innovative educators in the world (Fig.1) [2].

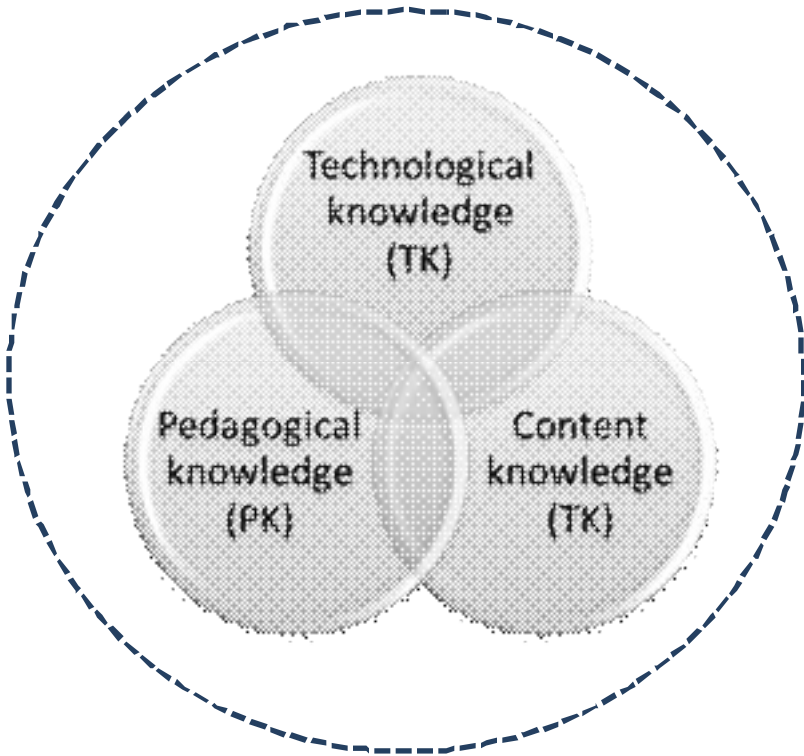


Fig. 1. The TPACK framework and its knowledge components

Secondly, the use of TPACK with the combination of the elements of the 21st century learning design programs, representing important skills for students, develops [1]:

- collaboration;
- knowledge construction;

- self-regulation;
- real-world problem-solving and innovation;
- the use of ICT for learning;
- skilled communication in a student’s technical skills formation process.

This combination is shown on fig. 2.

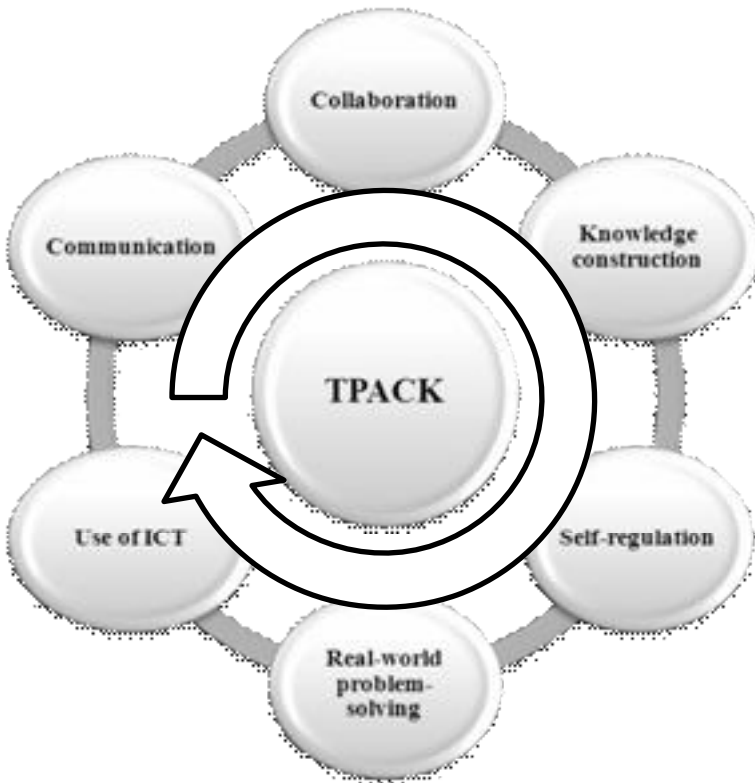


Fig. 2. Combination TPACK and 21st century learning design rubrics

The usage of TPACK elements in a student’s technical skills formation process is needed for the design of student’s personal educational environment, which contains:

- co-working with colleges on projects by means of the ICT;
- maintenance of effective communication;

- formation of topical and practice-oriented knowledge and skills.

Networking is a key element of interaction, collaboration and use of ICT processes in learning environment.

Thus, an actual goal of this research is to develop a network of interactions design as a tool for the information exchange as well the factor for increasing the learning process quality.

Analysis of recent researches and publications. The technique of ICT usage in the learning process, and in particular, organization at the appropriate level of networking is widely discussed in literature, e.g. [3-9]. The main directions of the researches in this area concern the following issues and aspects of their implementation:

- the discussed change in the paradigm of the participants' role in educational process.

- new conditions of higher education development, which are associated with the development of ICT and new generation of students.

- Hence, new problems have an impact on such components as:

- electronic content quality;

- innovative teaching methods;

- compliance with market challenges;

- educator's ICT-competencies;

- global processes shaping ICT trends in the learning environment:

- education for everyone, everywhere in the format 24/7 and the models of 1:1;

- dynamic educational programs and materials;

- collaboration in real-time using cloud technology, etc.

The above trends confirm the importance of networking as a technology platform for the construction of modern high-quality educational process.

The aim of the research is to substantiate the idea of the networking interaction in the learning process, for example Wiki-technology.

Results and discussion. As mentioned above, networking is the most important factor in ICT, cooperation and communication that provides access to education at a high level professionalism.

Based on this, much attention is given to practical aspects of its application in the educational process of two departments in Kharkiv State University of Food Technology and Trade. Overall, it should be noted that the experience should be considered as an attempt to follow new fangled directions of a network concept or collaborative learning with its various directions and ideas such as constructivism, collectivism, etc. It is rather the traditional approach to learning which uses network organization of its participants that makes it possible to form new information culture with

dominant logic of the network logic, affecting the process and quality of its results. Firstly, this type of network allows us to consider the interaction between the participants of educational process and its organization on ICT technological platforms as a complement to traditional educational technologies, increasing their interactivity. Secondly, it reserves the teacher's right to choose specific combinations of technologies within TPACK. However, conscious and adequate choice leading to effective results, outlines specific requirements to the personality of a teacher in terms of IT competencies, namely:

- the ability of fast mastering and working with educational and networking communication technologies, with integrated development tools of networking courses and networking communications, as well as with multimedia technologies;
- the ability to keep psychological stability during virtual collaboration with students;
 - effective time management;
 - be self-organized person, able to prepare all necessary components of the network syllabus in advance, as well as develop a strict appointment calendar of events during the course and all kinds of reports on educational objectives;
 - be prepared for very intensive information exchange through the model "teacher-teacher", "teacher-student" and "student-student";
 - actively promote and encourage joint work of students in the performance of educational tasks by means of network technologies;
 - actively inform students about their current academic performance, test scores, and control tasks via network technologies;
 - be prepared to change the content of the network syllabus quite often.

The educator should also realize the benefits of network collaboration between students. Their participation in online communities is one of the most effective forms of enhancing their independent work. This work has several advantages compared to conventional educational activity that primarily affects the lack of time limits for individual training module and the opportunities for individual hardware or software solution approaches. In extracurricular time students can prepare for seminars, work individually or collectively on a project, prepare for certification, be engaged in some remote module in another university, get additional education, or self-study. Any achievements obtained during extracurricular activities, as well as during seminars, are recorded in the information-educational environment of university. They can be made available to teachers and other students.

The full spreading of networking in teaching practice can become possible only if all interested students have access to the Internet. In world practice, the best-known model is "one student –one laptop." It should be noted that at present the word laptop seems to have a broader meaning and refers to any mobile device, by means of which you can have access to electronic content. This network infrastructure enables to use various service capabilities created in education, both on technological platform of Web 2.0, and with the use of the latest Web 4.0 technologies with its cloud 24/7.

Each of the Web 2.0 services has its specific place in the educational process (Fig. 3).

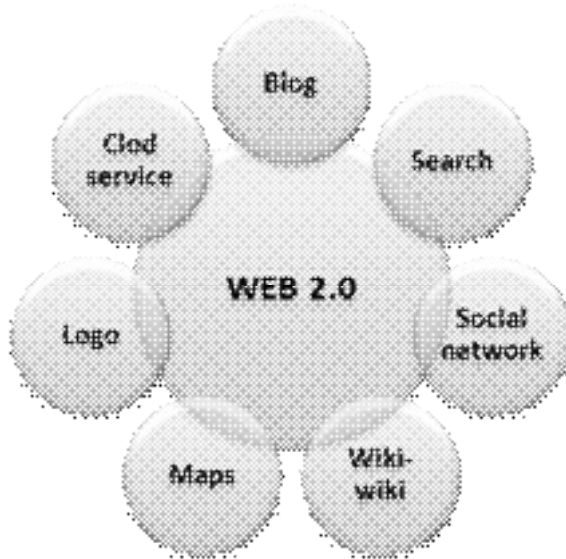


Fig. 3. The elements of Web 2.0 platform

Our experience of applying these services in the educational process concerns social networks, wikis and cloud services. Thus, online social networks perform such functions as communication networking, exchange of ideas and professional information obtaining, while cloud services are necessary online repositories with the structured educational information. Let's discuss the resource called wiki.

Wiki is an effective educational information environment. Its distinctive feature is a combination of the space of the discussion object and the very debate. The participants' communication is connected with the

design of educational material, and the teacher's role in the process of structural changes of a project. During the creation the content can be an organizer, designer, facilitator and a team member.

These roles' combination and their adequate understanding leads to a better performance and final result.

Wiki technology has several didactic advantages in the educational process:

- free access to educational and scientific information on popular Internet resources;
- the possibility of searching necessary information;
- obtaining personal information;
- student's consulting program ;
- interactivity during virtual educational process

As for practical implementation in 2013-2015 academic years, the Department of the Science of Commodities and Goods Examination participated in NUTRILAB international project, whose aim was the creation of the image of a modern average consumer and establishment of his behavior during the choice of food and drinks. The researches were based on consumer preferences in the markets of five Black Sea countries. Students enrolled in the department, compared national conformity of National requirements of marking food to the ones of European Union via Wiki-technology.

At the same time, educators of the Department of General and Food Chemistry focused on the design of principles for Wiki, called CHEMWIKI - an electronic information resource of inorganic chemistry educational course. It contains information about the chemical elements, their physical and chemical properties. As against other similar resources [10], this project is focused on food technology. Therefore, during Wiki articles development, the students paid more attention to the properties of chemical elements and structural construction of the resource.

Another important principle is interactivity of the resource. The search for its implementation is carried out in two directions. The first relates to the creation of Wiki original construction with easy access to a well-known software MediaWiki. The second direction is based both on placing resources in the Internet as a separate site, and in the system of virtual learning Moodle University, which may bring to life the principles of 24/7 information access wherever.

The project has three main stages:

- creation of Wiki program environment with the help of the most IT-skilled students;
- creation of Wiki articles by students in a structured format on the given subject with the electronic content quality expertise by all project participants;

– project management with the allocation of roles to students in the organizational structure of the network interaction.

To sum up all of the above, it should be noted that implementation of the network interaction into the learning process based on using the example of Wiki technology provides significant advantages for all participants of the educational process.

Firstly, it concerns any student mastering the basics of effective communication, developing teamwork skills with the elements of leadership, obtaining the necessary knowledge of the Internet as a source of information for professional growth. These aspects affect his cognitive activity and, as a possible result, impact on performance.

For educators, these advantages are obvious. It is the ability to publish teaching materials with 24/7 access for students and greatly enhance interactivity. This factor gives the teacher more possibilities to consult students, even personally. Networking enables the teacher to create a platform for collaboration on educational projects and become a pledge for enhancing the network research projects.

Conclusion. The analysis of current trends in the educational process towards the implementation of information and communication technologies allows to justify the need for the organization of network cooperation in the educational process as a factor of quality improvement. Use of modern technologies with traditional Wiki forms of training can significantly enhance the effectiveness of educational process by such factors as cooperation, individual student activity and the process of self-control electronic content development.

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Губський Сергій Михайлович, канд. хім. наук, магістр прикладної економіки, доц., кафедра загальної та харчової хімії, Харківський державний університет харчування та торгівлі. Адреса: вул. Ключковська, 333, м. Харків, Україна, 61051. Тел.: (050)364-03-34; e-mail: s.gubsky@hduht.edu.ua.

Губський Сергей Михайлович, канд. хим. наук, магистр прикладной экономики, доц., кафедра общей и пищевой химии, Харьковский государственный университет питания и торговли. Адрес: ул. Ключковская, 333, г. Харьков, Украина, 61051. Тел.: (050)364-03-34; e-mail: s.gubsky@hduht.edu.ua.

Gubsky Sergey, Ph.D. (Chemistry), MAE, Associate Professor, Department of General and Food Chemistry, Kharkiv State University of Food Technology and Trade. Address: Klochkovskaya str., 333, Kharkiv, Ukraine, 61051. Тел.: (050)364-03-34; e-mail: s.gubsky@hduht.edu.ua.

Вінікова Владислава Олександрівна, канд. техн. наук, кафедра товарознавства та експертизи товарів, Харківський державний університет харчування та торгівлі. Адреса: вул. Ключківська, 333, м. Харків, Україна, 61051. Тел.: (057) 349-45-60, (066)846-99-10; e-mail: tovaroed206@rambler.ru.

Винникова Владислава Александровна, канд. техн. наук, кафедра товарознавства та експертизи товарів, Харківський державний університет харчування та торгівлі. Адрес: ул. Клочковская, 333, г. Харьков, Украина, 61051. Тел.: (057)349-45-60, (066)846-99-10; e-mail: tovaroved206@rambler.ru.

Vinnikova Vladislava, Ph.D., Faculty of Commodity and Commercial Activities, Department of Commodities and Commodity Expertise, Kharkov State University of Food Technology and Trade. Address: Klochkovskaya str., 333, Kharkiv, Ukraine, 61051. Tel.: (057)349-45-60, (066)846-99-10; e-mail: tovaroved206@rambler.ru.

Кобрін Віталій Миколайович, д-р техн. наук, проф., кафедра товарознавства та експертизи товарів, Харківський державний університет харчування та торгівлі. Адреса: вул. Клочківська, 333, м. Харків, Україна, 61051. Тел.: (057)349-45-60, (067)741-32-24; e-mail: tovaroved206@rambler.ru.

Кобрин Виталий Николаевич, д-р техн. наук, проф., кафедра товарознавства и экспертизы товаров, Харьковский государственный университет питания и торговли. Адрес: ул. Клочковская, 333, г. Харьков, Украина, 61051. Тел.: (057)349-45-60, (067)741-32-24; e-mail: tovaroved206@rambler.ru.

Kobrin Vitaly, Dr. of Tehnical Sciences, Professor, Faculty of Commodity and Commercial Activities, Department of Commodities and Commodity Expertise, Kharkiv State University of Food Technology and Trade. Address: Klochkovskaya str., 333, Kharkiv, Ukraine, 61051. Tel.: (057)349-45-60, (067)741-32-24; e-mail: tovaroved206@rambler.ru.

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ПРОБЛЕМИ ФОРМУВАННЯ ІНФОРМАЦІЙНО-ОСВІТНЬОГО СЕРЕДОВИЩА УНІВЕРСИТЕТУ

В.В. Чаговець

Проаналізовано проблеми формування інформаційно-освітнього середовища вищого навчального закладу. Розглянуто принципи побудови та складові інформаційно-освітнього середовища з метою інтенсифікації навчального процесу, наведено умови для його успішного функціонування.