

## Students' Network Project Activities in the Context of the Information Educational Medium of Higher Education Institution

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### ABSTRACT

The purpose of the research is justifying didactic possibilities of the use of network services for the organization of information for the learning environment of college, where students carry out their project activities, and where effective networking between students and teachers takes place. The authors consider didactic possibilities of network services for their applications at each stage of the project activity: search and research, design, presentation, reflective. The use of the following services is justified: sharing media materials, hypertext; services of co-editing text documents, spreadsheets, presentations; service of sharing maps and charts; on-line imaging service. During network project activity a developing information environment is formed. The analysis showed effectiveness of the creating of a shared information educational environment in college based on network services and the possibility of organizing productive project activities of students and full networking between students and teachers in this environment. The materials can be used in any educational organization, forming an open information environment for the organization of project activity of students. The continuation of the study validates the use of different models of organization of project activities.

### KEYWORDS

Information educational medium, project, network project activities, network services, cooperation.

### ARTICLE HISTORY

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### Introduction

The century of high technologies, communications and innovations imposes new requirements on the educational system. Under the conditions of the information society, where world knowledge quickly becomes obsolete, new requirements to personal and professional qualities, person's creative abilities and competences appear (Tremblay et al., 2012).

Continuously updating scientific knowledge makes a person have a sense of direction in the information space; critically approach to information selection; build efficient communication; work in team; take responsibility; be mobile, stress-

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resistant, tolerant; be focused on self-development. The application of the project method in educating contributes to these qualities.

The main goal of using the Project Method in the area of higher pedagogical education – formation of students' project thinking and training for using this method in future professional activity. Students' project activities within the process of education should promote formation and development of creative abilities, independent and teamwork skills necessary for future professional activity (Marstio and Kivelä, 2014; Stansiu et al., 2012).

The project method can be apparently used without information and communication technologies, but their use provides great advantages, since it allows realizing the opportunities of cooperation between students and teachers in the course of project activity to the full. Organization of project activities within the information educational medium of higher education institution (HEI) allows adding a developmental dimension to the teaching process, enhancing motivation of educational activities, developing students' necessary competences. Especially if project activities are of network nature.

At the end of the 20th – beginning of the 21th centuries we have become witnesses of the rampant development of the Internet, its ever growing use in all spheres of society. Today's stage of the Internet development differs with not only continuous increase in the number of users but also significant expansion of opportunities related to the active use of Web 2.0 services by users. Web 2.0 services blurs out distinctions between content creators and consumers. Web 2.0 technology involves users' activity focused on participation in content creation, active cooperation.

Project activity with the use of Web 2.0 services is an efficient technology, which dramatically increases the level of students' independence, their cognitive activity, develops communication skills, learning motivation, provides teamwork experience, experience of defining and solving problems, forms skills of working with different types of information, i.e. forms qualities necessary in the context of shaping the information society (Wang, 2013; Valencia and Cázares, 2016). At the same time, the university's information educational medium becomes the space of network cooperation of all participants of project activities.

### ***Problem Statement***

The quality of specialist training at the present stage of higher education development is evaluated with such indicators as competence, independence, readiness to make decisions in situations of alternative choice, skill to adapt under fast-changing political, social, and production conditions, continuing education and professional advancement motivation. For this aim corresponding medium should be established in HEI, innovative pedagogical technologies are applied.

In the context of this research when we say information educational medium, we mean a pedagogical system that combines information and educational resources; computer teaching facilities; educational process management means; pedagogical techniques, methods and technologies focused on the formation of an intellectual, socially important, creative personality with a desired level of professional competences.

The issue of significant influence of the Internet development on the sphere of education claims close attention. The development of the Internet involves acceptance of new cultural values, work methods and self-actualization, which is

particularly manifested among young people. However, the educational opportunities of the Internet are far from being used to their full extent.

The use of the Internet in university's educational activities doesn't reveal deep essence of person's new ways of life and professional activity in the information environment.

The today's stage of the Internet development is characterized by the active use of Web 2.0 services, which make it possible to organize network interaction participants' cooperation in an efficient way. We consider substantiation of didactic opportunities of using Web 2.0 services for shaping an information educational medium within which students' educational activities are carried out a relevant research and practice problem.

The use of Web 2.0 services is useful when applying different pedagogical technologies, but they're most efficient when applying the Project Method.

The Project Method contributes to students' independence, all spheres of personality, provides student's subjectness in the educational process. Students learn to use gained knowledge to solve cognitive and practical problems; acquire communication skills, working in different teams; develop their research skills. And the HEI's information environment based on network services provides the necessary organizational and pedagogical conditions.

### Literature Review

Today we pay great attention to the use of project activities, despite the history of the Project Method counts over 100 years. It appeared at the end of the 19th century in the US school and was also used in the national pedagogy. A.S. Sidenko (2003) carried out a detailed historical of analysis of the use of the Project Method.

Many researches associate the appearance of the Project Method as an individual method within the framework of the learner-centered approach to teaching with works of J. Dewey (1963) and W.H. Kilpatrick (1951). The idea of project learning appeared in Russia early in the 20th century in parallel with similar American researches. However, in 1931 in the decree of Central Committee "Concerning elementary and high schools" the project method was condemned (Kirillova, 2004).

At the same time, it was actively and successfully developing in the foreign school. In USA, Great Britain, Belgium, Israel, Finland, Germany, Italy, Brazil and many other countries where Dewey's ideas of humanistic approach to education, his Project Method had been widely disseminated and became very popular owing to reasonable combination of theoretical knowledge and their practical use for solving specific problems of the actual reality in students' collaborative activities. "Everything I learn, I know for what I need it and where and how I can apply this knowledge" – the main thesis of modern understanding of the Project Method, which attracts many educational systems reaching for a reasonable balance between academic learnings and pragmatic skills (Polat, 2007).

Despite condemnation and official ban of using the Project Method in the pedagogic practice, it was not forgotten completely and rejected by national didacticians. It found its greatest application in the technical creativity of the rising generation. Since the end of the 90s researches of the issues of project teaching have begun in Russia anew (Golub et al., 2006; Khutorskoy, 2013).

Professor E.S. Polat (2007) greatly contributed to researching the Project Method and grounding its opportunities use in students' ICT project activities. The scientist gives the following definition: "The Project Method is a means to achieve a didactic goal through detailed problem development, which should be completed with a real result executed in some or another way" (Polat, 2007).

Let's analyze researches dedicated to the use of information and communication technologies in project activities, substantiation of possibilities to organize project activities in the information educational medium.

Today the term "information educational medium" (IEM) is gained a footing in pedagogy, besides, modern researchers' definitions of information educational medium features both technological and pedagogical approaches, as well as their combinations.

L.K. Raitskaya (2011) reminds that Concept of Education Informatization 1998 of the Russia Federation reduced IEM to the complex of software hardware, information networks, etc. Obviously, the technological approach dominates when it's necessary to solve a complex of material and technical tasks, where humanitarian and pedagogical tasks cannot be implemented without material resources – software hardware and networks. Definitions of this approach prevailed in the researches and legal acts of the end of the 1990s and the beginning of the 2000s. The pedagogical approach has become more widespread since 2003.

Numerous researchers, such as I.G. Zakharova (2013), E.O. Ivanova (2011), L.N. Bakhtiyarova (2014), I.V. Robert (2014), E.K. Samerkhanova (2011), L.K. Raitskaya (2011) and others elaborated and expended the notion of IEM, bringing into focus pedagogical and psychologic aspects of IEM.

Works dedicated to organization of project activities with the use of Internet opportunities, particularly, Web 2.0 services, are of primary concern for our research. The appearance of the term of Web 2.0 is usually associated with article "What Is Web 2.0" (O'Reilly, 2005). T. O'Reilly (2005) carried out quite a detailed analysis and comparison of Web 1.0 and Web 2.0, and also defined the latter: "Web 2.0. is a practice of designing systems that recording network interactions get better the more people use it". The researches of E.D. Patarakin (2009), Z.S. Seidametova (2012), A.V. Ponachugin (2012), B.E. Starichenko (2014), B.B. Yarmakhov (2015), W. Richardson (2010) and others are dedicated to the use of Web 2.0 services in education, including for the purposes of project activities.

### **Research Objectives**

Research objective is to substantiate didactic opportunities of network services for organization of the information educational media of HEI under which students' project activities are carried out and students and teachers efficiently cooperate.

### **Research Methods**

Methodological background of the research:

- theoretical and methodological analysis and synthesis of available specialized national and foreign scientific- methodic literature, conceptual analysis of related academic papers and publications;
- studying and generalization of both national and foreign developments and implementation of projects regarding establishing of information environments of educational organizations with the use of network services;



- using the methods of generalization, comparison, forecasting.

## Results and Discussion

Analyzing the relation of the Project Method technology and education informatization processes, the use of Web 2.0 services, it should be noted that new stage of the Project Method development is largely seen in it. This is reflected in opportunities of radically different arrangement of students' cooperation, access to information, the use of various online tools of intellectual activity, creativity and self-fulfillment. Organization of students' project activities based on the use of up-to-date means of Internet technologies is a subject of many researchers' works, which range of research problems relates to the education informatization issues. In our country these works are associated with E.D. Patarakin (2009), E.S. Polat and M.Y. Bukharkina (2007) and many others.

E.D. Patarakin (2009) notes that the medium of modern networks services provides an opportunity to create teaching situations, when students can directly master and develop competences necessary in the 21st century.

L.K. Raitskaya (2011) carried out the in-depth research "Didactic and psychological foundations of Web 2.0 technology application in higher professional development". The author researched regularities, structure and technologies of the Internet as an information educational media for carrying out student's independent cognitive activity therein. The researcher points out that Web 2.0 technologies have the potential for achieving new educational goals. It's possible to carry out team work, including cognitive and cognitive-educational activities, on Web 2.0 sites, which was almost impossible on the Internet sites of the first generation despite previously existing group forms of communication.

We're strongly agree with the author concerning the possibility to achieve new educational goals by forming such necessary students' qualities as critical and systemic thinking, social responsibility, tolerance, communication skills by means of Web 2.0 services.

From the diversity of all network services it's possible to distinguish a few most interesting for creating an information educational media: services for shared information search and storage; services for shared creation and use of media materials, hypertexts; services for shared editing of text documents, tables, presentations; services for shared use of maps and schemes; on-line visualization services (clusters, mind maps, timelines, infographics, etc.).

Let's analyze the main stages of students' project activities and their organizational possibilities under the information educational media of HEI with the use of Web 2.0 services (Figure 1).

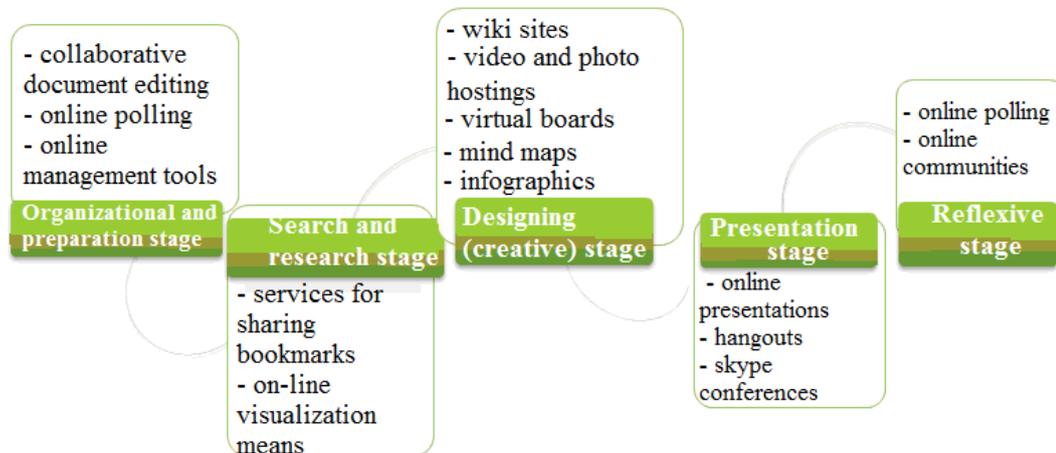


Figure 1. Means of organizing students' network project activities' stages

During Organizational and preparation stage students choose research topics, search for problems, suggest hypotheses for their solution, choose methods of problem solution, discuss research methods and ways of project results presentation, plan their activity. Problem analysis, research objectives statement can be carried out in documents of collaborative editing, through carrying out brainstorming using on-line mind maps, cause-effect maps, visual ranging tools, SWOT analysis and other means of on-line visualization. Discussion of possible options of research, comparison of suggested strategies and choice of methods of problem solution can take place via interacting in blogs, on wiki sites, in Google groups and online communities, through online polling. Teamwork regarding researches planning can be organized with the help of various project management software tools (such as Gant diagrams).

Search and research stage involves data retrieval, systematization and analysis. In this case it's efficient to use services for shared matching of bookmarks to resources on the research topic with annotating, create various resource catalogues. It's possible to use visual ranging means, visual dictionaries, make cause-effect maps, timelines, various schemes in the course of research. Students can make mind maps as a result of information gathering and structured representation.

Designing (creative) stage is for direct carrying out of research. Different methods are used at this point: methods of observation, analysis and synthesis, surveys, development of project products. Research authors have a great deal of various tools. The forms of research results presentation can be discussed in wiki, shared documents, on online interactive boards, in online communities. The course of research can be recorded on wiki sites, in shared documents and tables. It's possible to organize videorecords of observations, experiments, interviews and then upload them on various video hostings. Photo hostings are designed to upload research subjects' photographs and processes. On-line polling should be organized for various surveys. Team working with maps, simulation in tables of shared editing, the use of infographics, interactive posters, etc. are also efficient.

Presentation stage. Presentation of projects, self-assessment and peer assessment of carried out researches take place at this stage. Research findings can be presented in the form of on-line presentations, with the use of wiki articles,



timelines, mind maps, photo albums, video clips, screencasts, various schemes, etc. Projects can be defended both in presence with the use of various presentation technologies and in the form of video meetings, Hangouts, skype conferences, etc. Self-assessment and peer assessment of carried out researches can be carried out in shared documents, blogs, with the use of on-line visualization tools.

Reflexive stage. Its goal is to summarize results, state conclusions and suggest new problems, reflect (on the part of teacher and students). Reflection can be carried out by means of blogs, conceptual tables, graphs, various visualization tools, etc. Online polling can be used to analyze teamwork success and student's own contribution to the team's work. It's efficient to keep project's online portfolios, analyze them.

Examples of organization of Minin Nizhny Novgorod University students' network project activities can be found in E.P. Krupoderova's (2013) and K.R. Krupoderova's (2013) works.

Students upload portfolio of their projects on the university's wiki site (<https://wiki.mininuniver.ru>), use the following Web 2.0 services: collaborative document editing (<https://docs.google.com>), on-line presentation (<https://docs.google.com/presentation>, <http://prezi.com>, <http://www.calameo.com>), on-line visualization (<https://cacoo.com>, <http://www.mindmeister.com>, <https://bubbl.us>, <http://www.gliffy.com>), timelines (<http://www.dipity.com>, <http://www.timerime.com>), virtual boards (<http://wikiwall.ru/>), etc.

In the course of network project activities the project's developmental information media is being formed, on one hand, for free development of participants' creative individuality, activity, on the other hand, for nurturing collectivism, cooperativeness, mutual assistance. Systematic practice of collaborative activities forms independence and responsibility for one's own work and work of the team as a whole.

## Conclusion

The carried out analysis of didactic opportunities of network services makes it possible to conclude the efficiency of shaping information educational media of HEI based on them and possibility of organizing students' fruitful project activities, sound network cooperation between students and teachers in this media.

Web 2.0 social services are a priori focused on the team approach to developing intellectual content with decentralized participation of a great number of people. Cognitive, creative and educational activities acquire the network and team character.

We examined didactic opportunities of network services for their use at each stage of project activity. Other IEM components important for organizing project activities are the following: available hardware and software (computer classrooms, mixed-media facilities, interactive equipment, licensed software); necessary information resources, available bank of projects; using learning models: 1 student: 1 PC, BYOD (Bring Your Own Device), flipped classroom, extra mural studies, etc.

Certainly, teachers' willingness to organize students' project activity within the information educational media of HEI is of prime importance. University's teachers can take opportunities of formal and informal advanced training, participation in social pedagogical networks in order to acquire necessary competences in organizing students' project activities.

## Disclosure statement

No potential conflict of interest was reported by the authors.

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