The Network Community as Instrumental Environment for Supporting the Training Process of Teachers of Computer Science

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Abstract
This article is devoted to the ways of teaching of Computer Science of students of pedagogical education in network community. The author considers educational possibilities of network community, pedagogical features of teaching of Computer Science using educational network communities. The article presents a model of the educational network community built using Web 2.0 services – blogs. The author considers pedagogical features and the ways of project activity organization using educational network community.

Key words: network community, blog, teamwork, project activity, Computer Science teacher.

An effective mechanism for mastering the future teacher of disciplinary content in the field of computer science is the implementation by students of educational activities in the educational network community through the implementation of purposeful, productive and professionally-oriented interaction of subjects of learning with the didactic and communicative capabilities of the network community.

Under the educational network community, we mean a training group of interacting subjects of the educational process that support communication and carry out active joint educational and cognitive activities using social Web 2.0 services, functionally oriented toward the solution of pedagogical tasks [3].

We see the educational opportunities of the network community primarily in the context of the deployment of social and personal relations in the Internet, the implementation of learning technologies based on the active activities of students, including mutual cooperation, joint creativity and the development of personally significant Internet resources.

The network community provides opportunities for students to interact based on individual and collective resources, creating new information materials using Web 2.0 services that support the joint activity of users on the Internet [1].

The active use of the network community in the education system makes it possible to train future teachers of computer science in the following types of professional activities:

– the organization and implementation of communicative activities of students;
– the creation of new networked educational resources;
– the use of educational resources of the Internet in pedagogical activity;
– self-development and self-improvement of professional qualities.

To ensure students' access to information resources and exchange of information between students and the teacher, was used an asynchronous tool Web 2.0 - a blog created using WordPress service.

To implement the network community for the education process we built a system of blogs containing the educational-administrative blog and student blogs [4].

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The educational-administrative blog is created and maintained by the teacher, which contains the following units:

**Educational unit** – contains educational and methodical materials, announcements.

**Organizational unit** – used to manage the learning process, contains information about the goals and objectives of the course, the curriculum, the schedule of classes.

**Communication unit** – used to provide and support communication between students and the teacher and among themselves.

**Control unit** – used to evaluate the learning outcomes, students’ performance table, questionnaires and test tasks.

**Technical support** – used to help students manage their personal blogs.

All students of the training group as secondary users get access to an educational and organizational blog in which each participant of the educational network community can comment on the messages of other participants, express their point of view, ask questions or ask for help in solving problem problems.

The schematic structure of the training and organizational blog is shown in fig. 1:

![Fig. 1. The schematic structure of an educational-administrative blog](image)

The secondary elements in the educational network community are student blogs. Each student creates his own blog, in which he can post personal information about himself and his interests, solve laboratory work and practical tasks of the course, multimedia materials (audio, video and photo), presentations. Also, in the personal blog, the student publishes a report (on a separate page) following the semester or the entire course in the form of a collection of links to the relevant publications of his blog. The teacher, referring to the links and browsing the completed tasks, evaluates the work of the student for a certain period. Thus, every student blog represents a personal educational space. The structure of the student blog is shown in fig. 2:
A student blog can also be created by a small group of students working on a joint educational project. In the course of its implementation, each student has the opportunity in the student blog to discuss the stages, objectives and ways of implementing the project, to offer their ideas, to place their own results of the project at a certain stage, to ask for help from their colleagues in resolving problem situations, etc. Group work brings students to new ways of joint activities and supports collective constructive networking activities.

Schematically, the model of the educational network community based on blogs is presented in fig. 3:

The basic principle of the functioning of an educational network community is to highlight the importance of the common effort, the talent and the skills of each person and to valorize the training process, which is based on social relations. The educational network community based on blogs can be used: a) as a communication and information tool; b) for online communication; c)
as a collaborative tool; d) for the purpose of knowledge management and sharing; e) in the development of some projects.

The construction and operation of the educational network is carried out in several stages [2].

I stage – socialization (first week of training). The goal of this stage is to bring students closer to each other, choose the preferred teaching styles, reveal the prevailing abilities and traits of each person, discover the qualities of leadership, create a sense of belonging to the educational community. Based on the information provided by the students, the teacher distributes students to groups to work on individual projects.

II stage – cooperation (13 weeks of training). The goal of this stage is to work on the project and to strengthen the team through teamwork. This stage, in turn, is divided into several successive phases: (a) electronic brainstorming; (b) personal rankings of ideas; (c) debates and collective rankings of ideas; (d) collective project development.

During the electronic "brainstorming", students, using available means, the results of personal searches, their own knowledge and accumulated experience during the period of studying and training this discipline, formulate as many ideas as possible regarding the way the project is implemented. Previously, students become acquainted with the classic rules of "brainstorming".

As part of the electronic "brainstorming" a "performance table" was created, which was updated daily by the teacher and had open access for each team member. The table contains information about the number of ideas formulated by each student.

Using this table allows:

a) increase the motivation of each student to improve their own achievements;

b) place each student in the comparison situation based on knowledge of the number of ideas formulated by colleagues;

c) simplify the evaluation of each student's contribution to the project development.

After the end of the phase of formulating/generating personal ideas, which can take up to three weeks, students get access to the bank of ideas of the team.

The personal ranking of ideas consisted in an individual classification of all the ideas that emerged: from the most appropriate ideas that could lead to a solution of the problem formulated in the project, to less appropriate ideas. This phase contributed to cognitive maturation, which consists in integrating and associating various ideas proposed by colleagues. Cognitive maturation contributes to group reflection, i.e. critical thinking of the participants of the team results of their activities, the search for new ways to solve the problem, planning and analysis of joint actions [5].

Various individual classifications have been discussed and, as a result, a collective (joint) classification of ideas was compiled.

The main point in this phase is the presence of a socio-cognitive conflict. The team members were aware of the existence of solutions that differed from those offered by themselves. The debates that took place at this phase obliged participants to seek additional information, which led them to a different level of understanding, i.e. to the independent acquisition of new knowledge.

After fulfilling the joint classification of ideas and choosing the best solution, the team began the implementation of the project. As a rule, during this phase, students performed different roles: designer, editor, coordinator and others.

Stage III – evaluation (last week of trainings) was divided into two phases:

- discussion of the implemented product together with the teacher. This phase was carried out in the virtual and real world (in the auditorium);
- presentation of the project team in the presence of an academic group. The last phase was carried out in the auditorium.

The use of the educational network community in the context of the subject training of future teachers of computer science can reduce the negative impact and risks of the modern informational and educational environment of higher education institutions, and optimize organizational forms of interaction between students and teachers.
The results of the implementation of the educational network community, in our opinion, allow us to conclude that creating and supporting such a community in the education process provides a flexible and open educational environment for the practical acquisition of new knowledge, in which students exchange information, establish new ideas, extend their point of view, share their learning experiences and discuss their views with each other during debates, together perceive the content of the matter subject and solve tasks, problems.

Bibliography: