Electronic Portfolio Method in Students' Progress Assessment and Development for Students Specializing in Pedagogy

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Abstract—**Russian system of higher education needs new technologies for students' competencies evaluation (we are speaking about students specializing in Pedagogy). We consider Electronic Portfolio method within the system of quality assessment of informational and communicative competencies among future teachers and demonstration of the actual ability to solve difficult problems in their future professional activity. We also consider methodological aspects of Portfolio application within the course of Information Technology in Education and other pedagogical disciplines. We examine steps of electronic portfolio development.**

Index Terms— **E-Portfolio, competency approach, e-learning, constructive learning system**

I.   PORTFOLIO METHOD IN EDUCATION

The main means of informational competency development of future teachers should be solving profession-orientated problems connected with informational activity. Consequently for assessment a person's informational competency it is necessary to assess the efficiency of the solved problems. One may speak about the increase in value of the individual informational activity experience of every future subject teacher.

The problem of storing the results of the informational competency shows itself in the process of activity. We consider that the most convenient method for solving the above mentioned problem is "Portfolio" method. This method is significant for future subject teacher from the professional point of view as it allows storing the material indicating the future teacher's information competency development.

Apart from the mentioned above the future teacher should form his personal "scale of valuables" with the help of which he could expose his own progress or failures in the sphere of information competency development. "Portfolio" method allows a future teacher to learn how to adequately assess his own achievements and opportunities and draw conclusions upon the mistakes which have been made and aim at self-perfection work as in Ref. [7]).

Ref. [8] gives the main characteristics of the portfolio structure among which:

- target of Portfolio compilation;
- criteria for choosing materials for the Portfolio;
- ensuring credibility of "Portfolio" method as the method of assessment.

A.   Classification of Portfolio

The analysis of the scientific sources reveals different approaches to classification of Portfolio (Table 1).

TABLE I.
CLASSIFICATION OF PORTFOLIO ACCORDING TO [9]

Basis of Classification	Authors	Content
Function	Ref. [1]	• educational Portfolio (scratch version), demonstrating personal or professional growth in the process of education; • assessment Portfolio (resultant Portfolio, Portfolio for demonstration including the best works), used in the context of formal assessment (correlating with the traditional methods of progress evaluation); • Portfolio for presentation purposes, for presenting to the prospective employers.
Objective	Ref. [6]	• "Portfolio – property", which is compiled by the future teacher for his own needs; • "Portfolio – report", which is compiled by the future teacher for presenting to the prospective employers or experts for assessment.
Content	Ref. [4], Ref. [6], Ref. [5]	• Portfolio of achievements, containing evidence of success of the future teacher. Its aim is to develop the level of self-respect (awards, diplomas, certificates, letters of gratitude, etc.); • reflexive Portfolio, containing materials for assessment and self-evaluation of goals achieved, self-analysis of the results of his own educational

Basis of Classification	Authors	Content
		work, impressions, reflexions, etc. • problem-research Portfolio, containing materials revealing the goals, the process, the results and the stages of solving a problem; • topical Portfolio, containing materials describing the work carried out within the given topic; • Portfolio for developing the skills of higher thinking, containing materials on the process of learning (analysis-synthesis-assessment level); • Project Portfolio (developer's Portfolio), containing materials connected with the Project work (drafts, plans, sketches, short-hand records of discussions, visual images of the results, etc.)
Form	Ref. [1]	• paper Portfolio, containing paper artifacts; • digital (computer) Portfolio, containing materials transformed in the digital form; • electronic (analogous) Portfolio, containing evidence in the form of audio and videocassettes.

The described stages of creating a Portfolio may be presented in the form of the scheme (Fig. 1).
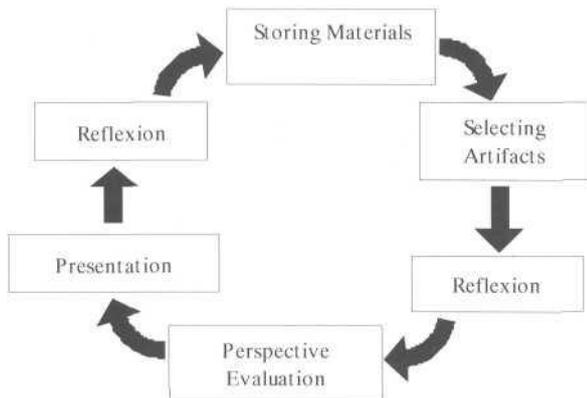

Figure 1. Stages of Creating a Portfolio

B. Portfolio as the Method of Development. Reflexion.

Portfolio may be used not only as the method of assessment but also as the method of development. According to [10] many research works reveal the important role of the acknowledgment by the students the ways to increase their skills and quality of their work. It gives additional motivation to self-perfection. Work with Portfolio allows to lay the stress on the transition of the knowledge obtained by the future teachers into new contexts, adaptation to the new conditions within the university and outside.
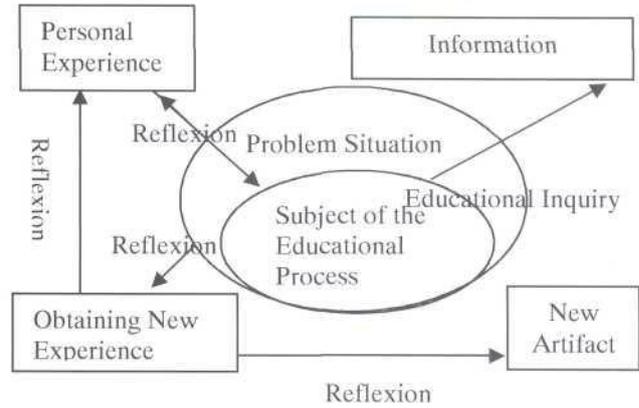

Figure 2. Reflexive Analysis Used at Portfolio Method for Developing Informational Competency

C. Electronic Portfolio.

Electronic Portfolio is the hypermedia resource - evidence of competency is in the electronic form (web-pages, connected by hyperlinks). Every artifact is supported by the comment of the future teacher and the reviews of different experts-evaluators. Ref. [2] states that the electronic Portfolio may include traditional marks also as an addition. According to Ref. [3] application in the electronic Portfolio different types of information (text, graphics, audio and video records) is its big advantage. It may also be placed in the local network or in the web-site of the educational institution.
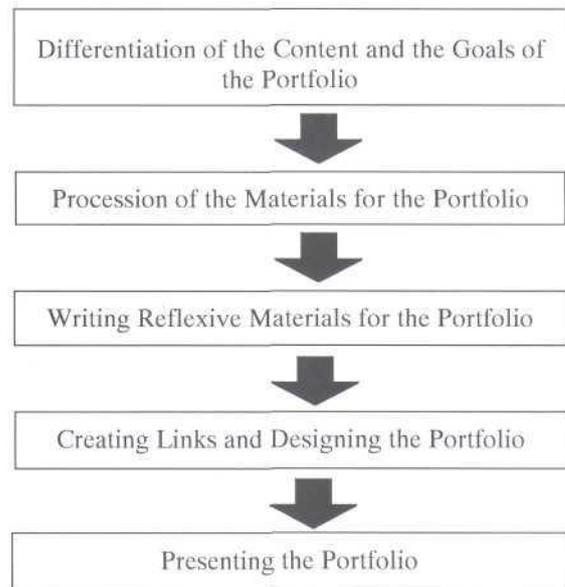

Figure 3. Stages of Creating an Electronic Portfolio

Within the course in "Technical and Audiovisual Educational Aids" we suggest to apply project Portfolio, which will contain all the materials created within the work on the Project.

We suggest that the reflexive component of the "Portfolio" method of study should be reinforced by means of increasing the amount of the problems which are

supposed to include reflexion of the future teachers upon their activity. Reflexion should be the part of work on every stage of the Project.

Thus the Portfolio should include the following materials:

- Grounds for choosing the topic;
- script of the multimedia product or multimedia resource, timeline of the work;
- diary describing the work on the Project;
- essay describing the results of probation of the model;
- report on the results of the correction work and improvement introduced into the Project;
- resultant reflexive work;
- fragments of the model probation (photos, interviews with the participants, etc.);
- fragments of multimedia product or hypermedia resource;
- fragments of the project parts which were corrected or improved, before and after introducing the changes.

We developed a system we named "Electronic Portfolio" with the help of which students may compile "Project Dairy".

D. Authoring System "Electronic Portfolio".

The System "Electronic Portfolio" consists of the two main parts:

- "Dairy" (for student's reflexive notes);
- "Portfolio"(for works);

Apart from this the System contains two supplementary components:

- "Register" (information about presence at the lesson);
- "Supplements".

In this System every student has his own password which provides personal access.

The Diary contains an electronic form. Filling it every student reflects the work which had been done during the lesson and defines the following three most important points:

"1 have learned" - the student distinguishes what was new for him during the lesson (new information, new skills, new experience, etc.).

"1 failed to/1 had difficulty with" - the student features out what he was not able to do, what problems he faced and lack of what knowledge he feels, etc.

"I would like to know / I would like to learn" - the student points out what he would like to know or to learn, what needs does he have, etc.

From our experience we may conclude that the students need 5-7 minutes at the end of each lesson to fill in the Diary. "Diary" is connected with "Register", and it makes the students fill it every lesson. In case the student does not fill in the corresponding field in the Diary, the system does not mark him as "present" at the lesson.

For adding a new element in the portfolio a student should fill in the form containing the following questions:

- name of the work;
- picture, representing the Project;

- short description of the work (description of the problem, goal of the work, the content of the work, etc.);
- link to the wok published in the network or loading the file;
- self-review and self-evaluation of the work, including description of the advantages and disadvantages of the work, distinguishing the direction in which the work can be improved, reflexions about the work, etc.

Practical work shows that it takes a student 20-30 minutes to create a picture representing the project, by himself or with the help of the teacher and fill in the form for the new Portfolio element. This task should be carried out at the very end of the Course.

. II. TEACHER'S ROLE IN THE INDEPENDENT DEVELOPMENT OF HYPERIMEDIA RESOURCES.

A. Sources of Information

We believe that within the course future teachers should use several sources of information:

- teacher as a person of informational competency;
- sources of information in the Internet;
- learning and methodological materials (textbooks, books, educational aids, step-by-step instructions, etc.);
- inquiry systems of instrumental environments;
- lecture synopsis;
- other team members and students.

It is very important to make a gradual approach toward introducing several sources of information. Practical work reveals that in case the sources are not introduced gradually, taking into consideration their significance and grounds for their application in the context, most of them become unused.

Practical work reveals that the students asking the teacher for help for every insignificant reason get accustomed to it and show themselves helpless in problem situations but not the competency. Future teachers should be taught to independently use information sources to overcome difficulties they meet. Apart from the active students who ask questions very often there are those students who prefer not to inform the teacher about the problems they face, because of fear to show their incompetency or because of their shyness. As a result they idly spend time during the lesson. Practical work shows that in case they are left without teacher's attention in problem situations in future they will also reveal themselves helpless which leads toward the refusal to solve the problem.

B. Place of the Learning and Methodological Materials in Organizing the Learning Process in the Course in "Hardware and Software ".

Organizing future teachers' activity within the course implies independent study of given technology of creating multimedia products or hypermedia resources with the help of different information sources.

We in our work used several step-by-step instructions devoted to the work with programming environments like

Microsoft FrontPage, Microsoft PowerPoint, Adobe Photoshop.

C.   Using Local Network and Internet.

Local network is used in education for solving the two basic problems:

- ensuring convenient access toward the learning and methodological materials of the Course;
- ensuring access toward the authoring System "Electronic Portfolio".

Internet is used in education:

- as the source of information;
- as means of communication.

Within the framework of this Course communication between teacher and student by means of electronic mail is regarded only as an alternative means of communication and only for students who study at home.

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