MONITORING STUDENTS' INDEPENDENT WORK

MONITORIZAREA ACTIVITĂȚII INDEPENDENTE A STUDENȚILOR

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În articol se prezintă un studiu asupra monitorizării activităţ ii independente a studenţ ilor. Se demonstrează eficacitatea dirijării lucrului independent al studenţ ilor (LIS) prin intermediul e-portofoliilor. Dirijarea LIS are influenţ ă asupra motivaţ iei învăţ ării, care reprezintă un factor important pentru dezvoltarea învăţ ării autonome.

1. *Current Situation of SIW Skills Development*

Learning effectively means you wish to reach a result, which is consciously set as the aim of learning and actively get involved in achieving it. Critical reflection on the alternatives, persistent action, quality orientation and the use of metacognitive strategies enhance the positive results of effective learning. Students achieve success, if they know and can effectively apply a range of cognitive, metacognitive, affective and resource management strategies in any situation. Respectively, each of the above strategies corresponds to specific activities, which when repeated become work skills. SIW skills are formed/developed over the time and require a solid basis for an effective development. They must be formed at school and perfected at the university, however university training shows that most often these skills lack.

Independent work is intended not only to achieve success in a subject, but to help students develop skills of independent work, solve problems by obtaining constructive solutions on their own, coping with critical situations etc. According to the conducted survey, the failure of university students to succeed in different subjects is caused by: overloaded programs and curricula, lack of learning materials, lack of guidance, while studying new materials. The main reason is that *students lack skills of independent work.* Questionnaires on the students' organization of independent work were distributed at different faculties of Alecu Russo Balti State University, Tiraspol State University and the State University of Moldova among students and teachers. Students' questionnaire was distributed among a sample of 300 students in the first cycle of studies, both full time and part time. Teachers' questionnaire was distributed among 50 teachers from different departments. Analysis of the data, obtained from the questionnaires, is presented in the article [1].

Statistical processing, analysis and interpretation of students' and teachers' responses set off two main directions in quality improvement of SIW: diversification of teaching / learning strategies and massive use of information and communication technologies (ICT). Diversifying teaching methods allows the teachers to take into account students' *different learning styles* and determine SIW skills appropriate to these styles. The use of ICT in education makes it possible to raise the level

of autonomy in learning. SIW skills are formed and developed interactively through computer applications. Search and information processing using information technologies make this process more efficient. Formation/development of SIW skills depends on the sources used and on the strategies that are formed through directing the SIW. Monitoring SIW can be done in the student's presence or remotely. In case of remote SIW monitoring ICT can be effectively used.

2. *Implementation of E-Portfolios to Monitor SIW*

In order to present strategies/ methods to develop SIW skills, the author developed a specialized site. Reading, writing, communication and presentation skills acquire new forms due to the implementation of information technologies. Formation of correct learning skills require a theoretical substantiation, passing through implementation stages, advice on how to form and use efficiently these skills.

Skills can be evaluated by placing students in difficult (quasi) professional situations. The most appropriate tool for assessing competence is electronic portfolio. Of all the applications that allow the students to create electronic portfolio Mahara software was chosen. It can be used separately or as a module of MOODLE platform. An electronic portfolio or e-portfolio is a generic term that covers a wide range of product types, which offer reasons to use them. A portfolio will be developed in the course of the subject study. Students place in the portfolios the results of the tasks they performed, either individually or in teams.

In fact, an e-portfolio has a much broader scope than a collection of online thoughts and digital objects (such as documents, images, blogs, CVs, multimedia, hyperlinks and contact information). E-portfolios are used to demonstrate knowledge, skills, values and achievements. Students can use e-portfolios to demonstrate their learning outcomes, while teachers can record their achievements over the time for a selected audience. The e-portfolio motivates students, facilitates objective assessment, encourages discussions on students' performance and sustains internal communication and metacognitive processes such as reflection [2].

The idea to use Mahara application to create portfolios rises from practical needs. While teaching the course "Design of the student-centered learning process", prepared for the European project WETEN (Western-Eastern Teachers Education Network), the contents of the students' portfolios were sent by email to the teacher of the course. That information was placed in directories/folders, created for each student. While processing the information received from a large number of students, some information was lost; other was placed in a "wrong" folder. E-portfolios can help minimize these disadvantages [3].

Monitoring SIW through network has a number of advantages that have been proven in the pedagogical experiment performed: time saving, differentiation and individualization in the course of educational process, collaboration with colleagues, tutorials, presenting the learning outcome in accessible and economical formats, objective assessment.

The students in the experimental group were created accounts in Mahara application, which allowed them to place the results of their individual work in portfolios. Portfolio items, presented by the students of the experimental group, were systematically

evaluated and students received the necessary feedback. At the students' request, the address of the final project and sources that present interest for the students of the course were posted on Mahara platform.

Students in the experimental group were given access to the content description of laboratory work that was placed on the same platform. Students were able to evaluate themselves and be evaluated not only by the teacher, but also by their colleagues.

3. Description of the Pedagogical Experiment

Laboratory work is an important form of SIW for computer sciences specialties, as it requires mastering of a set of skills such as: planning, search of additional information, self-assessment, generalization, product presentation and so on. The quality of laboratory work and the quality of its defense are reliable criteria of student's mastery of skills of SIW. Therefore, the marks, the students obtained for the laboratory works, should be a part of the final mark in the subject. Simultaneously, the comparison of marks for the laboratory work, obtained by students in the experimental group and those from the control group, allows the teacher to decide on the extent to which the students have developed SIW skills.

The experiment involved 102 students from the Computer Sciences Department of the Faculty of Exact Sciences, Alecu Russo Balti State University. The experimental sample included 52 students and 50 students were part of the control sample. While forming the samples care was taken to make homogeneous groups of students, in terms of their training. The purpose of the pedagogical experiment was to determine the impact of SIW monitoring on their performance while fulfilling the laboratory works. Monitoring was carried out using the Mahara application.

Students in both samples had to do the same laboratory work. To perform the laboratory work, students in the experimental group were able to collaborate through the network with their peers and the teacher outside the classroom. Collaboration included presentation of work, mutual assistance, providing guidance and systematic feedback by the teacher. Presenting the laboratory work through the network reduces plagiarism, encourages exchange of ideas to stimulate learning and, to a lesser degree, competition.

Laboratory works were marked by the same criteria, both in the experimental group and in the control group. In the experimental group the average mark for laboratory works was higher than in the control group.

To demonstrate that the difference between the marks, obtained by students in the experimental sample and in the control sample, is not random two statistical criteria were used: Rosembaun's Q criterion and Mann-Whitney's U criterion [4].

Hypotheses were formulated for both criteria:

$H_{0:}$ The level of criterion in the experimental sample does not exceed the level of criterion in the control sample.

$H_{1:}$ The level of criterion in experimental sample exceeds the level of criterion in the control sample.

In the case of Rosenbaum's Q criterion, the calculated value of Q_{emp} proved to be equal to 8. The value of $Q_{crit} = 8$. At significance level $p = 0.05$, since $Q_{emp} = Q_{crit}$ hypothesis H_1 is accepted.

Using Mann-Whitney's U criterion confirms the same hypothesis (U_{emp}= 912, $U_{crit\ p=0,05}$=1053, $U_{crit\ p=0,01}$=951, $U_{emp} < U_{crit}$).

The formation experiment proved the efficiency of e-portfolios in monitoring the SIW, it fosters collaboration between students while elaborating projects and contributes to joint education. Although students were encouraged to place the results of their independent work (results of laboratory work, the final report on the project) into their e-portfolio for evaluation, some of them, accustomed to work traditionally (in their presence), cast doubt on this mode of assessment (fear to lose information, fear that the result will be plagiarized by colleagues).

Monitoring SIW influences the motivation to learn.

4. Defining Factors for Learning Motivation, which were Influenced by Monitoring of the SIW

Motivation is a dynamic concept, which originates in the trainee's self-perception and his/her perception of the environment, and which stimulates him/her to choose the activity, to engage in it and persevere in its realization to achieve a goal. Motivation is a characteristic of the affective domain, fig. 1.

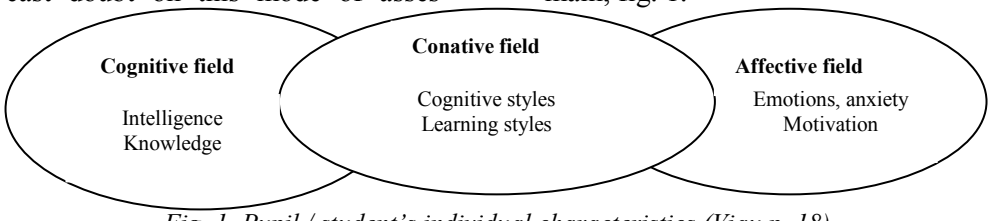

Fig. 1. Pupil / student's individual characteristics (Viau p. 18)

A questionnaire was used to detect factors that influenced the learning motivation in the pedagogical experiment on the monitoring of SIW through e-portfolios. The questionnaire consists of 33 questions, referring to 11 sources of learning motivation, according to R. Viau's theory of motivation. The 11 sources of motivation, discussed in the experiment are: importance/meaning of the activity/learning, assigning success, assigning failure/ill success, anxiety in assessment situation, perception of own competence, the goal: performance, learning or minimal effort, will to learn, attractiveness, intrinsic value of the course/interest.

One of the motivation sources is the importance/meaning of the learning process. Studying computer sciences usually presents interest for students due to their applied nature. The first question most of the students seek to answer when beginning the study of a new subject is: How can this subject help me? Does it make sense to make efforts to study it?

Prior to the experiment 59% of experimental group of students attached importance to learning, compared with the control group, in which 56% of students attached importance to learning, fig.2 (almost every time, frequently). After the experiment there is an increase in the importance of learning in the experimental group (61%) and a decrease in the control group (49%) (almost every time, frequently). This difference can be explained by the feed-back that was systematically provided to the experimental group and the lack of it for the control group.

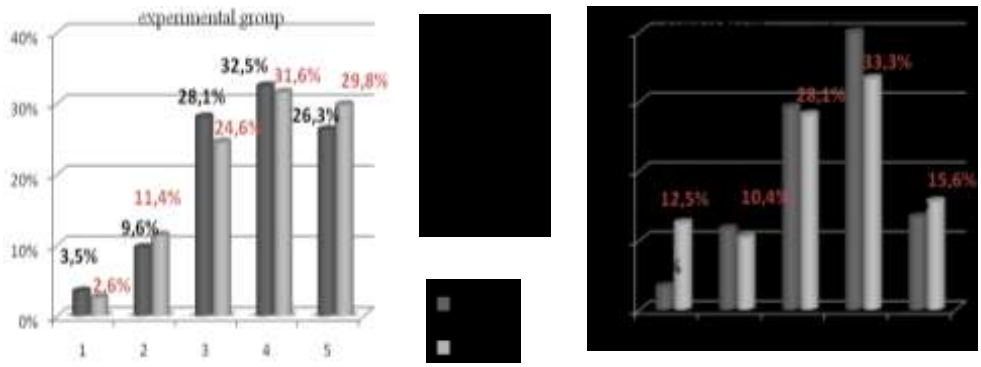

Fig. 2. Comparative analysis of the importance/meaning of activity/learning.

Monitoring SIW resulted in a 13% increase in the perception of student's own competence in the experimental group, compared with the control group, which saw an increase of 2%.

The success is a final consequence of motivation. In general, a perseverant pupil/student, who uses effective learning strategies, succeeds. If success is the result of motivation, then motivation can be considered a source of learning [6].

Conclusions

SIW skills are necessary to ensue autonomous learning. Formation of the appropriate IW skills requires monitoring of these activities. Monitoring can be carried out in the student's presence or remotely. The e-portfolio can be used to achieve efficient SIW monitoring. The portfolio reflects not just the results of the student's independent learning, but also the dynamics of this activity and is an efficient tool for collaboration between students and teacher.

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