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Information technologies as the subject of university studies

Barbara Gocłowska*, Zdzisław Łojewski

Institute of Computer Science, M. Curie-Skłodowska University,
pl. M. Curie Skłodowskiej 1, 20-031 Lublin, Poland

Abstract

Diametrically different curricula of Information Technology are used by the Faculties at our University. The authors of this paper studied effectiveness of students teaching in some faculties of MCS University. They prepared the program of Information Technology for all students of MCS University wich will be the subject of this paper.

1. Introduction

Computer science develops so rapidly that it makes specialists spend much time following the progress both in hardware and software. Common computer users are far behind. However, they are outspaced (at least at present) by the graduates who base themselves on the information technology and computer science programs in secondary school. Unfortunately, it does not apply to the students having classes in basic computer science at university. The paradoxical situation is that the level of teaching contents in secondary school [1-2] outspaces that included in university syllabuses [3-4]. That refers to many universities, not only Polish or European but also those on other continents [5-10].

The differences consist in various approaches to the subjects. At some universities students are taught basic computer programming [10] or efficient use of Microsoft Word text editor and Excel sheet [5] and there are also such where students acquire basic (discouraging from further self-education) knowledge in various operational systems, mainly DOS and Windows.

Methods of conducting classes are not always optimistic. Generally students are not required much effort and work after classes, completed algorithms of solving individual problems are given, thus not creating a habit of making use of help. Despite the difficulties, education within bases of computer use has functioned somehow so far. Beginning with the next academic year the situation

*Corresponding author: *e-mail address*: Barbara.Goclowska@umcs.lublin.pl

will change radically due to bulk of knowledge acquired by the graduates in 2005, both in junior and senior secondary schools.

This makes universities work out new curricula of information technology education according to Ministry of Education and Sports' standards and compatible with curriculum of the secondary school. Such an attempt has been undertaken based on computer programming skills of students at our university [11]. However, its realization (Figure 2) can be difficult mainly for three reasons.

The first one refers to extensiveness of the prepared curriculum (development of some curriculum contents realized at school).

Another one results from lack of a suitable number of computer laboratories at universities providing possibilities of work after classes.

The third difficulty is caused by differentiated science computer knowledge acquired by students. This problem will be the object of our consideration.

In the case of students of any university subject besides those of Mathematics and Physics Faculty (the computer science studies there is subject "Essentials of computer operation"), the knowledge level at the start is less differentiated within the group and much lower compared with that of the students of physics, mathematics and chemistry. This is associated with the fact of possessing the computer by most of those (physics, mathematics) students. Such a situation occurs also in other countries [Mayer]. The simplest solution would be division into groups depending on the level of knowledge and skills (as in the case of foreign language teaching). However, congestion of the computer rooms and organizational difficulties of universities resulting from an increasing number of studies (as confirmed by the data of statistical year – book) do not make it possible.

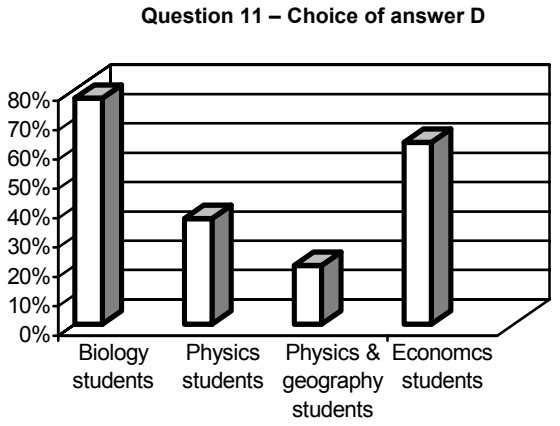

Fig. 1. Distribution of correct answers to one of the questions examining skills of using the office packet Word

The studies [11] carried out on some groups of biology, physics, and geography as well as economics students disclosed greater differentiation in computer science knowledge. Students of physics did their best in most test questions. They had good knowledge about most popular operation systems, computer architecture and internet [11-12]. However, they showed surprising deficit in some subjects e.g. edition programs service [12] which was known for students of biology and economics (Figure 2).

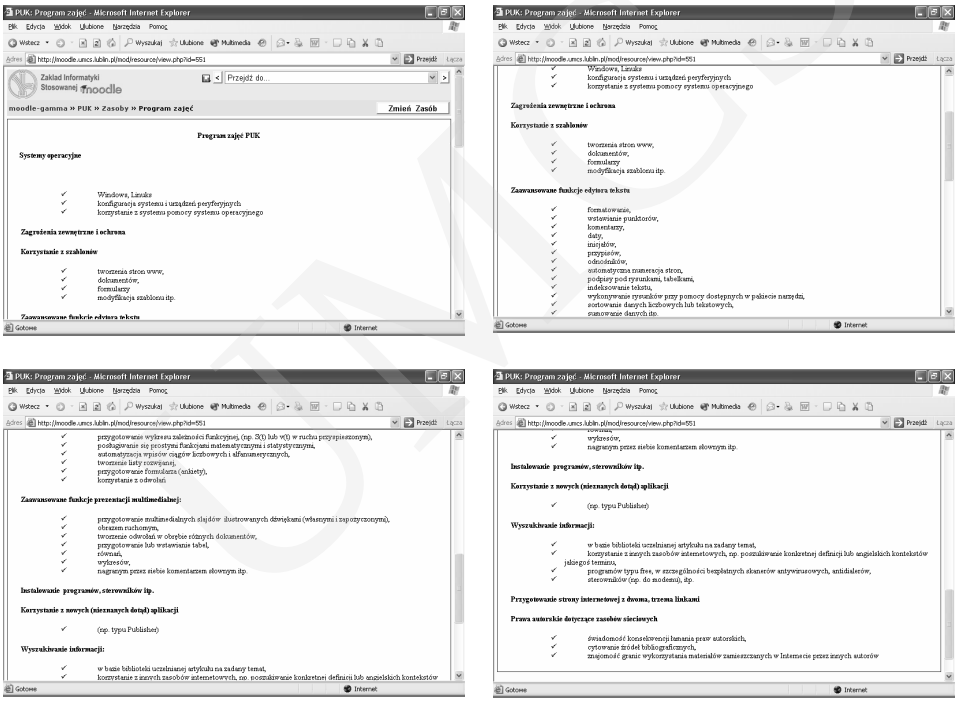

Fig. 2. Moodle platform with the test curriculum of Essentials of computer operation classes

As follows from the studies, the student groups taking part in the information technology classes are differentiated and only a specific form of work with computer oriented. Moreover, the instructors cannot make students aware about their fragmentary and incomplete knowledge. Simply speaking according to young people's opinion, using the computers is limited to computer games and internet surfing without knowledge of information science basics. Our aim is to elaborate such curriculum of computer science classes so as to change this unfavourable trend of computer technique application.

Our proposal includes the use of distance learning. It enables reduction of a number of students taking direct part in classes to a group standardized as far as the level of knowledge is concerned. In our opinion the situation should change dynamically for the reason of knowledge level differences in transition from one

thematic group to another. The fragments of the results of research carried by us can be a good example. The students possessing the starting knowledge surpassing that of their colleagues do not have to take direct part in classes. However, their duty is to consult with platform and solve the tasks which are not obvious to them.

The attempt undertaken in the Applied Computer Science Department, M.C.S. University is based on the fragmentary realization of some tasks which are extension of school curricula. We assume that the average student has good knowledge in information technology achieved in the junior secondary school (Fig. 3) [14].

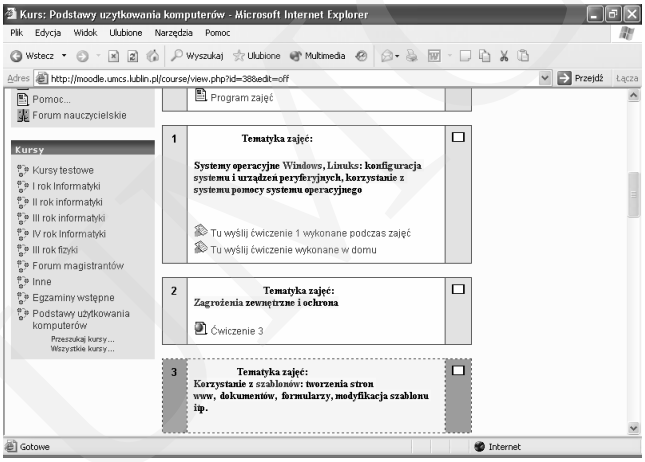

Fig. 3. Links into the internet resources proceed in a few ways

The second assumption includes the work of typicaly training character. The student does a defined task during classes and another one as homework. To make our requirements easier, we are preparing class modules assisted by the materials available in the network within the blended [futa] method (Fig. 4). The experiments made while conducting other classes show that students often use the materials suggested by us while doing their homework and learning for the test.

The exemplary task for students is that related the programmatic motto "Using the applications unknown for the student". The aim of this task is to overcome student's distrust and fear of using a new program unknownto him. To achieve this aim we have chosen two applications: schedule from the Mandrake Linuks package and Microsoft Publisher from the Microsoft Office. In the second case the student's task was to prepare an information brochure about Ohm law (figure text tasks). The most essential was lack of any prompts by the instructor in both cases. Students have come across the usable programs of similar menu structure and despite strong inner resistance they start to work with

the program effectively after 5-10 minutes. It should be stressed that they are forced to use help system in a natural way which is the weakest point of most computer users. The content of task was placed in the link "send here the task way".

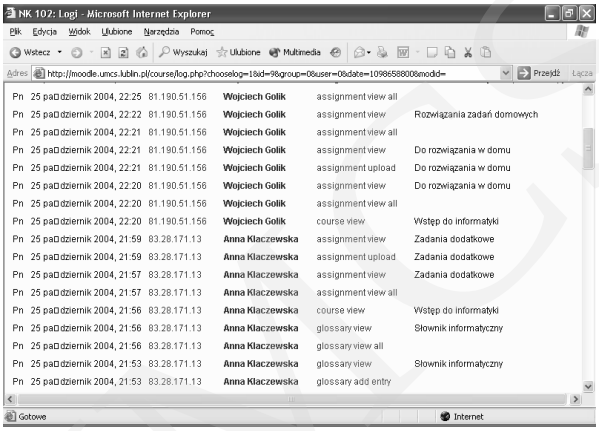

Fig. 4. Window with the information about time of using platform by students after classes

Conclusions

The example chosen to illustrate the program allowed us to explain the essence of „fragmentary" realization of the program content prepared by us. Nobody is able to teach students how to use a tool which is computer for 30 hours without the own contribution. However, if we assume that we focus on some not trivial elements of science, putting the greatest stress on forming a habit of using the help system, the aim starts to be achievable.

Information technology development rate causes changes in educational ways. The most important is to make student self educate. We must teach in such a way that this activity should be made use of but not only remain a slogan on a piece of paper.

The next important issue are tasks solved by the student outside the classroom. Some university teachers oppose to giving students' homework from the subject called "Basics of computer use" in our faculty. This fact may be associated with poor infrastructure of universities. There are not enough computer rooms where a student could do the homework given by an instructor without queuing to get access to the computer. A similar situation is with the access to university handbooks (used during other classes). There are not enough handbooks but nobody makes a fuss about it. The student is required to master the material and prepare for classes. The data about the number of computers falling to one household (year-book) allow to conclude that almost every student

has a computer at home. However, an access to the computer network becomes a real problem. Therefore some of our students record during the classes the task content for their homework. The task is just begun on their own disc and finished at home. At the beginning of next classes it is sent to the server.

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