

Information and Communications Technology Skills in Differentiated Instruction of Students' Competences

Valeriu Cabac, Oxana Scutelnic

Abstract: Using information and communication technologies in the process of instruction contributes to the optimization of the teaching process, to stimulation of the students' skills to seek and understand the solutions, to work in teams. Through ICT, teachers can customize and create new, optimal and attractive methods for students.

Keywords: Informational Society, the Knowledge Society, information and communications technologies, differentiated instruction, approach skills.

1 Introduction

One of the most important consequences of the development of information and communications technology (ICT) consists in creating the premises of the Knowledge Society appearance (KS) or Knowledge-based Society. It is considered that the global Information Society (IS), which is expanding, is only a tool for global knowledge society constitutions [1].

KS is the result of the two global processes merge: (a) increasing the share of education, instruction and research in economic output, (b) rapid development of ICT. If IS puts the emphasis on developing technologies to facilitate access to information, then KS stresses upon building knowledge.

The globalization phenomena has led to "penetration" of national borders, leading to both the international labor market emerge, and to the creation of regional training and research spaces. In these circumstances, the national training system faces a dilemma: whether they keep their traditions and their own standard (having the risk of being "excluded" from the global system of training), or accept the expansion of more dynamic and competitive models (risking to lose their identity).

2 Competency Based Approach in Specialists' Instruction

Competency Based Approach is a response to labor market demands instruction systems, and it assumes preparing an increasingly qualified specialist, able to adapt easily to frequent changes in the work environment.

Competence can be seen as a bridge between resources (knowledge, skills, attitude) and situation (circumstances of the individual).

A person is competent if, being placed in a complex situation (learning, research, production), is able to select, mobilize and integrate a range of diverse resources (both internal and external) to achieve some relevant actions (based on the selected resources) to treat / resolve the situation successfully. Situation, resources and actions are the essential elements of competence.

Competences formation requires changing the process of instruction / teaching. The first change relates to the *modular* concept of the university courses. Within a module there are realized firstly the classes of *structuring knowledge*. Next, the teacher realizes the classes of *integration*. These classes make students acquire the real competences: mobilizing and integrating previously acquired resources in a number of situations. At the end of the module the teacher suggests certain situations to students where certain competences have not yet been exercised. These classes, in fact being assessment hours, are called hours of *adaptation to new situations*.

Practice shows that different students, being placed in the same situation, treat it differently, producing different actions based on different resources. This can be explained by the heterogeneity of the student body group. The teacher who wishes to obtain qualitative results in the formation of students should not be indifferent to their individual differences.

3 Differentiated Instruction for Students

Differences are natural and necessary elements of evolution. Diversity and diversification are characteristics of living organisms. An important task of both the school, and higher education, is to offer each student maximum chances to succeed. The absence of teachers' interventions may cause the individual differences between students to transform into unequal chances to become successful [2]. There exist three possible concepts to take into consideration the students' individual differences in organizing the instruction process [3]:

- naturalistic concept: the school takes into account the existent differences, but due to the existent approaches it preserves them;

- quantitative concept: implementing the idea of "giving more to those who have less" by multiplying support and assistance for the students;

- pedagogical concept: the development of approaches which consist in applying a diverse set of tools and procedures for teaching-learning-assessment in order to allow those students who are skilled and trained have differentiated competences to achieve common learning goals in different ways. This concept expresses the essence of differentiated instruction.

The teacher can differentiate: the process, structure, content and/or production [4].

To achieve differentiated instruction, besides a rigorous planning, requires prior preparation of the instruction process. This instruction supposes to measure / determine students' characteristics, preparing teaching materials, design and implementation / selection information and communication tools (blogs, email, forum site, e-presentation, editor). We propose to take into consideration while implementing the differentiated instruction four groups of characteristics: (a) students' intelligence forms; (b) learning styles; (c) culture; (d) individual characteristics.

Based on information gathered on students' characteristics, the teacher chooses one or more axes of differentiation (content, process, structure and / or production), selects the pedagogical formulas, selects the forms of differentiation and suggests exercises and learning tasks to students. The accomplishment of tasks by the student / team involves performing actions that are based on a set of intellectual operations, determined by multiple dominant intelligences. Intellectual operations are performed on content that can be different / varied. The process of solving exercises / tasks is also influenced by culture and individual characteristics of students. While fulfilling the exercises / tasks, the teacher, or at student's option, the computer provides the student / team with some support. Solving exercises / tasks is completed by presenting the student/team of a product, which also can be differentiated.

4 Using ICT in Differentiated Instruction of Students' Competences

The differentiated instruction process, which aims to build certain competences at students, ICT is used to inform students, to diversify learning media, to achieve teacher-student communication, student-student (especially outside classes), to assess students, to gather information about students, learning management process. While experimental teaching of the course "Operating Systems" at the Faculty of Engineering, Physics, Mathematics and Computer Sciences at Alecu Russo Balti State University, the blog was used as a tool of information and communication. The determination of student's characteristics was done through tests / quizzes, most of which are automatized. Students' profiles were developed electronically and stored in special files. The results of group learning activities were presented either in the form of reports (MS Word application) or as electronic presentations (MS PowerPoint application). The experiment has helped to improve student performance (degree of mastering the competences) and positive changes in learning motivation.

5 Conclusion

The real differentiation of the educational process of specialists in conditions of higher education massification is possible through the widespread use of information and communications technology opportunities (information, communication, collaborative activities, evaluation). Use of ICT allows to fully operate with the IS for professional and personal development, to preserve the students' identity.

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¹Valeriu Cabac, ²Oxana Scutelnic,
Alecu Russo Balti State University

¹E-mail: viccabac@yahoo.com

²E-mail: oxana.scutelnic@gmail.com