Synchronous Teaching of ICT courses to virtual classes over the Internet

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This paper describes the setting up, realization and assessment of four experiments which involved the synchronous teaching of different courses to virtual classes consisting of students placed at different countries at the same time and formed by the use of Internet-based e-learning environments. The first experiment concerned the delivery of a course on Operating Systems, the second experiment on Computer Networks, the third on Industrial Informatics and the fourth on High Level Programming. The students that participated in these experiments were from France, Spain, England and Greece. The purpose of these experiments was twofold. First to investigate the extend to which modern teaching methods which mix theoretical with experimental and collaborative work and promote the meta-cognitive skills of students can be applied to a multicultural virtual class of students by existing Internet-based e-learning technology. By the term Internet-based e-learning technology we refer to a suite of software tools that provide services of interactive oral, visual and written on-line communication of the instructor with students dispersed to different sites at different universities and or countries, the electronic presentation of teaching material, the sharing of computer facilities, simulators, virtual labs and the like and the formation of simultaneous groups of students the members of which are able to interact and communicate between each other. Secondly, to assess the impact that has on the student's learning process the application of a teaching method of the form just explained above by the use of Internet-based e-learning technology. Each experiment had its unique characteristics by means of which a specific parameter of the overall teaching and learning process was tried to be assessed. In the Operating Systems course more or less the focus was on the interactivity that an Internet-based environment allows between the students and the instructors and the mixing of the practical work with that of the theory at the same lecturing time. In the Computer Networks experiment, the focus was on the collaborative work that can be supported, that is splitting the students to virtual working groups assigning to each group a project and follow up synchronously the progress of the work of each group. In the other two experiments the focus was on combining all the features of the modern teaching method to a homogeneous class and not to a multicultural one. The virtual class in these latter two experiments was formed by distributing students of a university to different computer rooms within the same campus or participating in the class from their home.

Processing questionnaires answered by the students, interviewing both students and instructors and evaluating examination results, an assessment of the feasibility of applying a teaching method of the type explained above over the Internet and its

impact on the level of learning was made. Generally, both issues have been positively appreciated.