Piloting of a Joint European Bachelor Curriculum in Information Technology: Evaluation of a Course Delivery

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Key words: *curriculum development projects, pilot delivery, joint curriculum, information technology curriculum, e-learning*

Abstract:

The work presents an analysis of the students' feedback on piloting of one of the courses from the joint Bachelor curriculum in Information Technology developed in the frame of Socrates-Erasmus BIT2010 Project. The analysis emphasises on the course participators' satisfaction with the course content and structure, with the course delivery, with the applied teaching approach, etc. It resumes the learners' feedback about the achieved training objectives, learner's satisfaction, etc.

1 Introduction

Curriculum development projects play a very important role in the fulfilling of the objective of the Bologna Process [1] for harmonization of Higher Education systems of the different European countries and establishing of a unified European Higher Education Area.

The work presents results of the implementation of an ongoing project developed under the Socrates-Erasmus Curriculum Development scheme – Joint European Bachelor Curriculum in Information Technology for Higher Education 2010 (BIT2010). More specifically, it shows some statistics and analysis of the students' feedback on piloting of one of the courses from the joint Bachelor curriculum in Information Technology developed in the frame of the Project.

The statistical data is based on the students' answers to a special evaluation questionnaire intending to survey the profile of the participators and their satisfaction with the course content and structure, with the applied teaching approach, the users' feedback about what type of cognitive objectives the course stimulates, etc.

2 The Context

BIT2010 Project [4] is a three year project aiming to contribute to the Information Technology (IT) human resource development within the context of the Bologna Process and the "i2010 Initiative" with the main objective to design, develop and implement a new Joint European Bachelor Curriculum in IT.

The Project consortium consists of six European higher education institutions as follows:

- Carinthia University of Applied Sciences, Villach, Austria (Coordination institution);
- Ilmenau University of Technology, Ilmenau, Germany;
- Kristianstad University, Kristianstad, Sweden;
- University of Information Technology and Management, Rzeszow, Poland;
- Plovdiv University "Paisii Hilendarsky", Plovdiv, Bulgaria;
- University of Bucharest, Bucharest, Romania.

The BIT2010 implementation is organized under fourteen workpackages (WPs): Detailed project plan (WP01); Collaboration platform and e-learning technology (WP02); Needs analysis (WP03); Methodological/didactic guidelines (WP04); BIT2010 Curriculum design (WP05); Quality assurance system design (WP06); Organisational/juridical guidelines (WP07); Curriculum development Y1 (WP08, WP10, WP11); Pilot testing (WP09, WP12); Dissemination (WP13); and Management, monitoring, reporting (WP14).

The **BIT2010 curriculum** is designed on the basis of the existing bachelor study programmes offered by the partner universities for a three year study programme and consists of the following modules:

- MODULE 1. Mathematics and Statistics;
- MODULE 2. Scientific Basics;
- MODULE 3. Technology Basics;
- MODULE 4. Algorithms and Programming;
- MODULE 5. Software Development;
- MODULE 6. Network Programming;
- MODULE 7. Operating Systems and Data Communication;
- MODULE 8. Business Administration and Management;
- MODULE 9. Internship;
- MODULE 10. Project Work (Final Thesis).

The course piloted – "ASP.NET Programming with C#"– is one of the joint curriculum courses, developed in the frame of the Project. The course piloting is carried out as a part of the implementation of the WP09 in a distance learning mode. A significant contribution to that had the e-learning course with the same title developed (including e-learning and e-assessment materials, etc.) and tutored by the Project partner from Kristianstad University, Sweden. The It's Learning e-Learning Platform [3] was used to support students and the tutor in all aspects of the e-learning process.

The overall **evaluation of the pilot delivery** of the e-learning course "ASP.NET Programming with C#" has been done by means of the participating students' feedback. **The questionnaire** used to collect the feedback and thus giving the data for the feedback analysis presented bellow is proposed by the course tutor.

The questions included are relevant to the student's profile, course materials and delivery, achieved objectives and learner's satisfaction. The participants gave their evaluation answering to close using a 7-grade scale[1], to open questions as well as giving some comments.

[1] where 1='very poor' and 7='very good'; the number 4 corresponds to 'nor good nor bad'; if the question isn't relevant is marked with 0='not relevant'.

3 Feedback Analysis

The **profile** of the learners, who participated in the pilot course, could be described as follows:

- they are full-time students, enrolled in the Bachelor Degree Program in Computer Science at the Faculty of Mathematics and Informatics, Plovdiv University, Bulgaria;
- at the age between 18-20 years;
- 91.6% are male students and 8.4% are female students.

15 students have been registered in the course and 12 have successfully finished it.

3.1 Evaluation of the Course Materials and Delivery

The estimation of the course materials and delivery is performed in relation with their content, structure, scheduling, literature and the applied teaching approach. Students evaluated the course and its structure as a whole, and separately the lectures and the labs/exercises.

Description of moment/ part of course/ activity	Content	Structure	Scheduling	Literature	Teaching Approach
The course in its overall structure	6.2	6.1	5.3	5.7	6.3
Lectures	6.4	6.6	5.9	6.4	6.6
Labs/exercises	6.7	6.3	5.6	6.8	6.3

Table 1. Evaluation of content, structure, scheduling, literature and teaching approach

Table 1. shows the average of the corresponding grades given by the course participants.

The students gave almost excellent mark to the **content** (see Table 1, Figure 1). The overall course content received minimal grade 5 and moreover only by 17 % of the learners. The average grade for the exercises content is 6.7. The exercises received the maximal grade 7 by 75 % of the students, the grade 6 – by 17 % and the grade 5 – by 8 %. The lectures are also very highly rated (7 learners gave the grade 7, 4 – grade 6, 1 – grade 4).

In respect to the **structure** (see Table 1, Figure 1) the answers to the questionnaire show almost entire satisfaction with the lectures structure. Its average grade is 6.6, where 67 % of the students gave the maximal grade 7, 25 % – grade 6 and 8 % – grade 5. The structure of the exercises is assessed respectively with the grade 7 by 8 of the students, with the grade 6 by 3 of them and with the grade 5 by 1 student. The overall course structure has a very good average grade – 6.1.

The **scheduling** of the course delivery was rated lowest by the participants (see Table 1, Figure 1). It does not mean that the course scheduling was inappropriate because 6 out of 12 students gave the grade 5 of the course scheduling as a whole. The average grades are: 5.3 for the overall course scheduling**,** 5.6 for the exercises scheduling and 5.9 for the lectures scheduling. Students are less satisfied with the exercises scheduling.

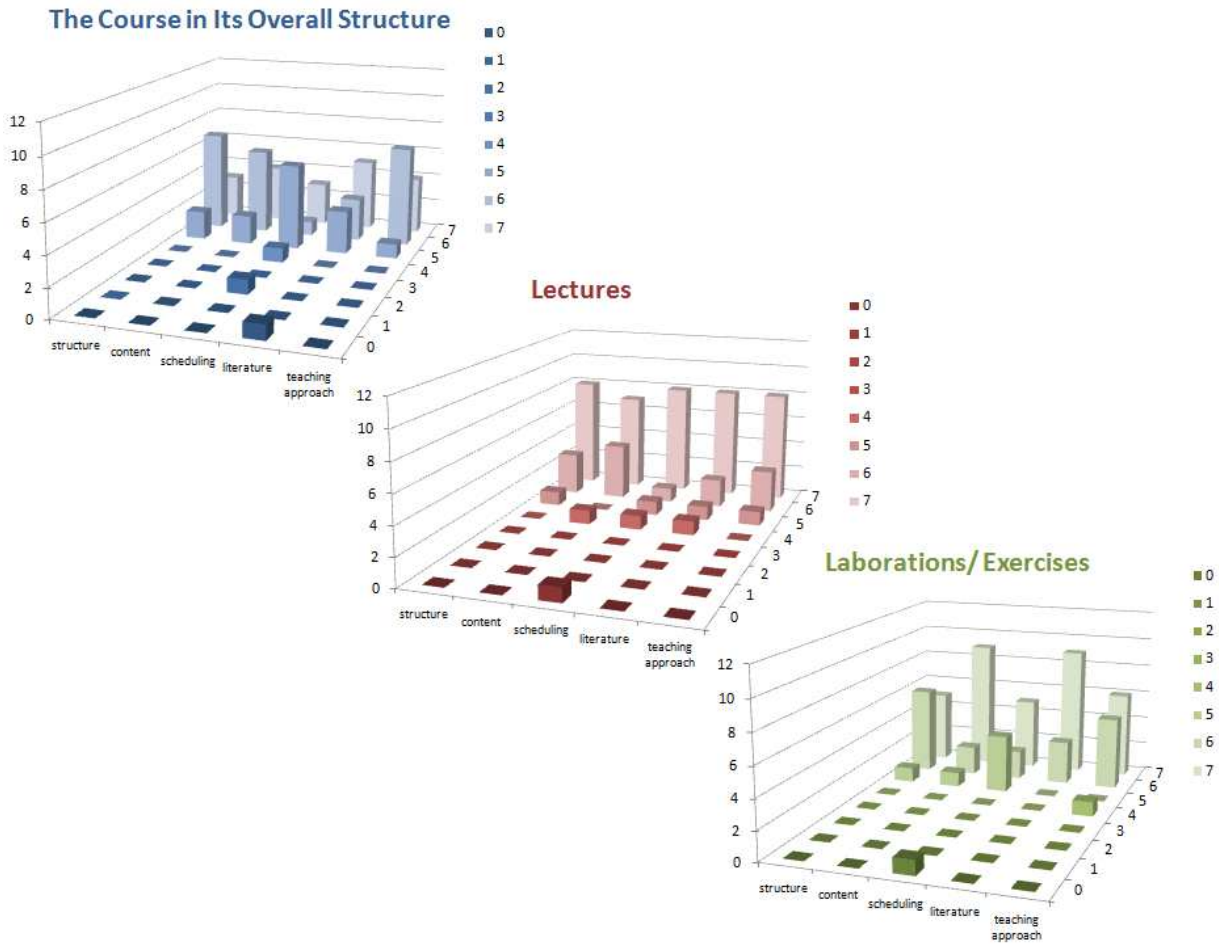

Figure 1. Students' estimation of the course materials and delivery

In the learners' opinion the **literature** specified by the tutor to support their study was almost entirely sufficient and comprehensive (see Table 1, Figure 1). Especially high – 6.8 is the average grade for the exercises literature. 75 % of the students assessed it with the grade 7 and 25 % of them – with the grade 6. The satisfaction with the lectures literature is also good – the average grade is 6.4. In details, 67 % of the students gave the maximal grade 7, 17 % – grade 6, 8 % – grade 5 and 8 % – grade 4.

The applied **teaching approach** during the course delivery is appreciated (see Table 1, Figure 1). Students gave almost maximal average grade – 6.6 for the teaching approach applied with relation to the lectures, 6.3 for those applied with relation to the exercises and 6.3 for those applied with relation to the course as a whole. The teaching approach applied to the lectures is evaluated with the maximal grade 7 by 67 % of the learners while the lowest grade 5 is given from only 1 student. In evaluation of the teaching approach applied to the exercises the lowest grade is 4 (8 % of the learners) and the maximal mark is 7 (50 % of the students).

The learners' answers to the open questions included in the questionnaire and their comments on the course materials and delivery are summarized in the Table 2.

Open questions/ Comments	Summarization of the learners' answers
What is the strength of the course	online, distance and study at home very good lectures appropriate examples materials cover a large variety of subjects
What is the weakness of the course	short time between home works language – the course is entirely in English confusing homework assignments small technical problems with uploading of files with homework
Proposals for improvements	homeworks should be more complicated but not so many assignments should be a little bit more clear such courses should be more often
Comments in general	the teacher answered in all questions and almost immediately the course was excellent the students satisfied with what they learned and also pleased with the teacher's accessibility the aims of the course were clear and they followed strictly the content the assignments were interesting the course covered the basics which are really needed the course was not designed to make the students think critically but to obtain a solid base at ASP.NET using C# the lectures were comprehensible and pleasant to study examples were clear and helpful

Table 2. Answers to the open questions and comments

3.2 Evaluation of the Achieved Objectives and Learner's Satisfaction

One of the goals of the regarded quire was to collect feedback about **achieved objectives** (see Table3, Figure 2) during the course delivery. The questionnaire includes two types of objectives-related questions – related with learner's cognitive objectives and related with teaching objectives.

Table 3 presents the average of the corresponding grades given by the course participants to evaluate what type of cognitive objectives the course has stimulated. According to the learners the interest for the subject is stimulated mostly (average grade 6.1), as 75 % of them give grades 7 or 6. The minimal grades are:

- critical thinking and reflection during the course is – 0;
- ability of solving problems independently – 2;
- comprehension and knowledge in the area – 3.

In spite of the above given low minimal grades, they are only 8% of all respective grades. The grades 6 and 7 are about 33 %.

Interest for the subject	6.1
Critical thinking and reflection	5.0
Ability of solving problems independently	5.1
Comprehension and knowledge in the area	5.1

Table 3. Evaluation of the achieved learner's cognitive objectives

The learners' estimation on the fulfilment of the course teaching objectives (the relevance of the content) is very positive (Figure 2). The average result from the corresponding students' grades is 6.08, where 42 % of students gave the maximal grade 7, and the smallest grade 4 is given only from 1 student.

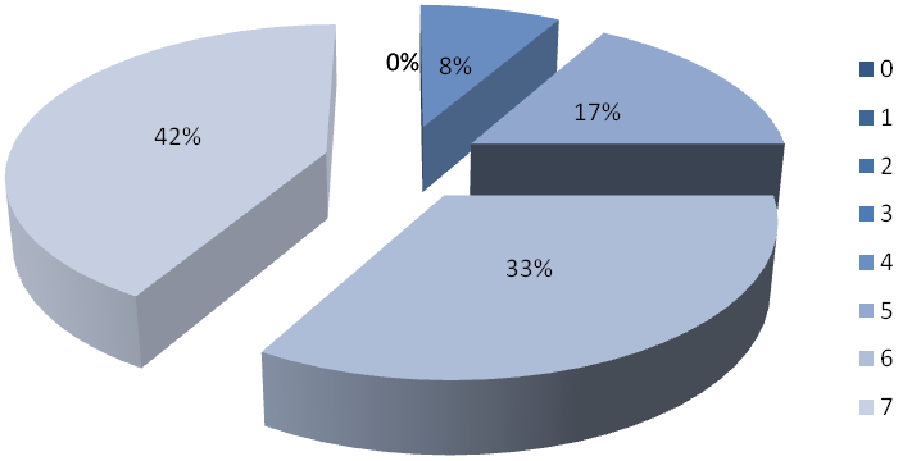

Figure 2. Evaluation of the achieved teaching objectives

The questionnaire includes also two types of questions related to the **learner's satisfaction** – satisfaction with their own efforts and satisfaction with teacher's accessibility in the process of study. Table 4 shows the very high average grade for the teacher's accessibility. 42 % of the students gave the maximal grade 7, 17 % – did not answer and 17 % – gave minimal grade 4. On the other side the learners are not so content with their efforts.

Are you satisfied with your own efforts altogether	5.8
Are you satisfied with the teacher's accessibility	6.1

Table 4. Evaluation of the learner's satisfaction

4 Conclusions

The presented analysis of piloting of one of the courses from the BIT2010 joint Bachelor curriculum in Information Technology clearly demonstrates the significant progress in the Project implementation. At the current stage the curriculum is in the process of development. The already developed courses are accessible on-line via the e-learning platform Moodle installed on a server at the Ilmenau University of Technology [2].

The development of the BIT2010 curriculum is aiming to provide:

- Stimulation of the attractiveness of European Higher Education Area
- Strengthening the dimension of the Bologna process
- Establishing a frame for educational cooperation between the Partners in the Information Technology area.

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