Informatics Education Europe II 2007: Results of the first Trial-Accreditations - Lessons Learned for the Euro-Inf Project

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This paper deals with the objective of defining common, Europe-wide standards and criteria for assessing informatics higher education as initiated by the Euro-Inf Project. Divided into five chapters, the paper firstly presents the background of the project tht is strongly related to the Bologna Process of creating a European Higher Education Area (EHEA). Secondly, it informs about methodology and activities of the project and, thirdly, discusses the output generated by the project partners with the involvement of various stakeholders from the field of informatics and quality assurance: the Euro-Inf Standards and Criteria for the Accreditation of Informatics Programmes. In the course of the previous months, the Euro-Inf Standards have been for their applicability, e.g. through an assessment visit at the University of Tuzla, as Chapter Four describes from the perspective of the programme coordinators. Chapter Five takes a look at the lessons learned from the so-called trial-accreditations. It is concluded that the learning outcomes stated in the Euro-Inf Standards represent what is "common sense" among European informatics teachers, even though the project does not attempt to settle the question of defining the term "informatics" exclusively.

Keywords

Bologna Process; accreditation; informatics; higher education; quality assurance; Bachelor; Master; degree programme; first cycle; second cycle

0. Introduction

After a short introduction to the Euro-Inf Project at last year's IEEI Conference in Montpellier, this paper presents the project outcomes hitherto, and discusses the results of the first procedures of testing the applicability of the Euro-Inf Standards and Criteria.

Chapter 1 includes a short overview on background and project objectives and the partner institutions of the Euro-Inf Project with regard to their contribution and background to the project. Chapter 2 presents learning outcomes and criteria for accreditation, i.e. the principle output developed within the first half of the project period. Chapter 3 is a shift of perspective from Euro-Inf to the view of the representatives of the University of Tuzla that has hosted an assessment visit with Euro-Inf. It gives an exemplary insight to the considerations to be made by a HEI in the context of a Euro-Inf assessment and discusses benefits and shortcomings of the review procedure. Chapter 4 returns to the viewpoint of Euro-Inf. It discusses lessons learned hitherto from the testing procedures, and gives an outlook on future challenges to be met by the project.

1. Background and Objectives

1.1 Context of the Project: Bologna

The European Union has identified removing obstacles to academic and professional mobility as one key issue for the success of the Lisbon Strategy [1]. In a knowledge-based economy, the welfare of any economic region rests on its ability to train and attract the best minds and offer them an environment where they can exchange ideas and create new knowledge, leading to improvements in goods and services and thus to sustained economic growth. This openness to the best minds does presuppose the – transnational – mobility of students, graduates of higher education institutions (HEIs) and professionals. This mobility, in turn, is greatly facilitated by the existence of tools for the recognition of qualifications and competences.

The Bologna Process is an attempt to meet the challenge of improving and harmonising education and training for the field of higher education. The Framework for Qualifications of the European Higher Education Area (EHEA) [2]**,** adopted by the European Ministers of Education in 2005 provides a generic tool for the recognition of higher education qualifications. It contains descriptors for the three programme cycles of higher education, based on learning outcomes and competences. In order to be applicable to the individual study programme, the generic Framework for Qualifications in the EHEA needs to be translated into the specific fields of study. The Euro-Inf Project aims at carrying out this translation for the field of informatics by defining learning outcomes for first and second cycle degree programmes.

1.2 A Tool for Quality Review of Qualifications, Facilitating Mutual Recognition

In the context of the objectives of Bologna and of the necessity for a life long learning, the Euro-Inf Standards and Criteria are intended to provide a means for reviewing the quality of higher education informatics qualifications in the EHEA, in a way that encourages the dissemination of good practice and a culture of continuous improvement of informatics programmes. It is for the appropriate authority in each country to decide if a qualification, accredited or not, is sufficient for professional practice in ICT in that country, or if further professional recognition of education, training or industrial experience are necessary. The decision on compliance with the Euro-Inf Standards and Criteria will assist such decisions, and particularly those that involve transnational recognition. It thus provides a basis for comparing educational qualifications in informatics in the EHEA.

1.3 Project Partners

The coordinating partner of the project is the German Accreditation Agency Specialised in Accrediting Degree Programmes in Engineering, Informatics, the Natural Sciences and Mathematics (ASIIN). ASIIN is a member of ENAEE and brings in its experience in the EUR-ACE project as partner institution. ASIIN is authorised to assign the EUR-ACE label for accredited engineering programmes and the Eurobachelor label for programmes in chemistry. In addition to its European activities, ASIIN is conducting and supporting accreditations and quality-assurance projects in several regions outside the EU. Furthermore involved is the Council of European Professional Informatics Societies (CEPIS) that represents 37 Member Societies in 33 Countries across greater Europe. It has been involved in several EU-funded projects such as E-Skills Foresights, Harmonise, aiming at improving and promoting high standards amongst Informatics Professionals in recognition of the impact that Informatics has on employment, business and society. The University of Applied

Sciences Hamburg, Department of Informatics brings in special expertise due to its experiences in a project for offering a joint degree programme in European Computer Science, currently borne by universities in five different countries. The University of Paderborn, Department of Computer Science has been acting as coordinator in several EU-funded TEMPUS projects leading to the establishment and accreditation of a Computer Science programme in all Bosnian universities as well as promoting the implementation of the Bologna Process. As such, he worked with a lot of high profile European experts in informatics higher education and will contribute the respective expertise.

2. Project activities

2.1 First Stage – Defining Standards and Procedures

First of all, it is important to note that the creation of the Euro-Inf Framework Standards and Criteria was not a straightforward task. It directly involved only one project partner that could, as German accreditation agency, provide the project with national standards and criteria for informatics programmes. At the outset, no other providers of national standards were involved in the project. Aim of the project was, however, to take into account all existing European national standards and criteria of reviewing informatics study programmes. Their characteristics, common elements, and comparative advantages would be discussed and best practices be chosen. However, results of preliminary research undertaken in October/November 2006 suggested that many national accreditation standards were either not published / not in force yet (Poland), or not translated into English (Estonia, Portugal) or simply not existing. To complete the picture, an alternative method had to be found to ensure that the set of standards to be developed would be based on valid information about established national practice.

Thus, a survey was conducted among relevant stakeholders among the member societies of the Euro-Inf partner institution CEPIS, representing 37 informatics societies in 33 Countries across the Bologna Area. The data were incorporated into a document entitled “Overview: Learning Outcomes and Accreditation Procedures and Criteria for Informatics Programmes in Europe. A Survey conducted among CEPIS Member Societies”, that can be found on the Euro-Inf webpage. The overview is continuously updated as corrections and additional information are made available by accreditation agencies and institutions all over Europe.

The major findings from the survey confirm the earlier assumption that informatics education is highly divers across Europe and most of the countries have not agreed on national learning outcomes for informatics graduates, nor have they yet developed accreditation standards and procedures which could have provided a stand-alone basis for the development of the Euro-Inf Standards and Criteria.

However, informed by the report “A Framework for Qualifications of the European Higher Education Area” agreed by the Ministerial Conference in Bergen in May 2005, as well as by the European Qualifications Framework and information available on existing national standards and accreditation guidelines, such as those published by e.g. ASIIN and the British Computing Society, a first draft of Euro-Inf Standards and Procedures has meanwhile been elaborated. This was done in close cooperation with the members of the Euro-Inf International Advisory Board, two of whom are longstanding members of the Italian and British national accreditation bodies BCS and GRIN. Through their participation compatibility of Euro-Inf with British and Italian accreditation standards was ensured. Also, together with Germany, these countries are among the few having introduced standards for informatics higher education at all.

A workshop held in Brussels on April 12th marked the conclusion of the main paperwork. In two parallel sessions, stakeholders from 15 different European countries were given the

opportunity to comment on the results of the survey and the preliminary output of the project work. Importantly, all participants had a background in both informatics and accreditation or other activities related to the higher education dimension of the Bologna Process. They discussed the tentative version Framework Standards developed by the Euro-Inf Board and made valuable and constructive suggestions for its further development. According to the amendments adopted at the meeting in Brussels the Euro-Inf Framework Standards were then further revised and refined.

2.2 Testing, Refining and Consolidating the Standards

In May 2007 the first public version of the Euro-Inf Framework Standards was published on the Euro-Inf website. Taking into account additional feedback and first experiences from the assessment visits of programmes in Tuzla in June 2007, a slightly revised version of the Euro-Inf Framework Standards and Criteria was adopted by the Project Board on July 31st 2007. Two more trial accreditation visits took place in September and October 2007 in Mostar and Tuzla (Bosnia and Herzegovina).

An application for a half a year's extension of the project period is currently being processed at the European Commission. This will give the project partners the opportunity to conduct further trial assessment visits, feedback rounds and discussions at various events in order to further improve the validity and applicability of the Euro-Inf Standards and Criteria. As final project output a consolidated set of Euro-Inf Framework Standards and Criteria for Accreditation will be adopted. Specific and detailed proposals on the make-up and terms of reference of the network that should run the award of the European Accreditation labels will be produced. Provided the Euro-Inf Standards are compatible with their standards and criteria, further national accreditation institutions will be invited to join the network. Also, an appropriate consultation system for future developments will be established, in order to guarantee that the accreditation system will not be a hindrance, but rather facilitate the introduction of positive innovations into the educational programmes and the curricula.

3. Learning Outcomes and Assessment Criteria

The Euro-Inf Framework Standards and Criteria include descriptions on programme learning outcomes, guidelines for programme assessment and accreditation as well as content on procedural aspects. For the purpose of this paper, the programme learning outcomes appear to be of main interest. They will be presented and discussed in the following chapter.

3.1 Learning Outcomes

Given the great diversity of informatics education across Europe, the attempt to create framework standards comprising all areas of the informatics discipline appears ambitious. Hence, in order to allow for possible inclusion of existing informatics specialisations within European Higher Education Institutions (HEIs), the framework must be formulated in rather general terms. Even more important it is to underline that all graduates of programmes assessed against the Euro-Inf Standards are expected to achieve the programme learning outcomes stated therein.

The programme outcomes can be described as quality standards for competences, skills and knowledge a graduate of an accredited course would be expected to have achieved as the education base for practising their profession or for post-graduate studies. It is important that the programme outcomes vary in extent and intensity in accordance with the differing objectives of First and Second Cycle degree (FCD and SCD) programmes. They have been ranged in the following four categories:

- Underlying Conceptual Basis for Informatics
- Analysis, Design and Implementation
- Technological, Methodological and Transferable Skills
- Other Professional Skills

For each of the mentioned category (“Underlying Conceptual Basis for Informatics”, “Analysis, Design and Implementation”, “Technological, Methodological and Transferable Skills” and “Other Professional Skills”) expected programme learning outcomes for informatics programmes have been formulated.

The first category “Underlying Conceptual Basis for Informatics” identifies capabilities that are essential to satisfying the other learning outcomes. Furthermore, it provides help for defining which knowledge and understanding graduates should demonstrate of their informatics specialisation as well as of the wider context of informatics. Subsuming the aspects “Analysis, Design and Implementation” in a single category appears worthwhile because they describe the basic steps of a work cycle. The category “Technological, Methodological and Transferable Competences” refers to the expected ability of a graduate to work to combine and abstract his/her technical skills to solve problems involving aspects of a wider, technological context. Thus he/she is able to use appropriate methods and material to achieve an industrial objective. Social or soft competences, listed under the category “Other Professional Skills” are crucial to communicate information, ideas, problems and solutions. Besides the so-called soft skills, the category refers to project management skills and the knowledge of disciplines and those ancillary principles that are relevant to the working environment of the graduates' specialisation.

The same arrangement of categories was maintained for the programme learning outcomes of Second Cycle Degree (SCD) programmes. They apply in addition to the competences described for graduates of FCD programmes. Although all four outcome categories are used to describe expected outcomes of both FC and SC programmes, there are important differences in the requirements at the two levels. These differences in the levels of First and Second Cycle accredited informatics programmes should inform the interpretation of the programme learning outcomes by HEIs and by auditing teams. For instance, whereas First Cycle graduates should be able to formalise real live problems where informatics are part of the solution, Second Cycle graduates are, in addition, expected to have demonstrated their ability to specify and solve informatics tasks that are complex, incompletely defined or unfamiliar.

No restriction is implied or intended by the Framework in the design of programmes to meet the specified programme learning outcomes. For example the requirements of more than one learning outcome could be satisfied within a single module or unit such as project work. Similarly, it is possible that some programmes are designed such that the requirements of the Other Professional Skills category are taught and assessed entirely within modules or units designed to satisfy the requirements of other learning outcomes, whereas in other programmes the Other Professional Skills requirements are taught and assessed in modules or units designed specifically for this purpose.

3.1.1. Learning Outcomes for First Cycle Degree (FCD) Programmes

Underlying Conceptual Basis for Informatics – First Cycle Degree

Graduates having completed a First Cycle degree should have demonstrated the following capabilities:

- knowledge and understanding of the principles underlying informatics
- knowledge and understanding of their respective informatics specialisation, and awareness of the wider spectrum of informatics disciplines
- a systematic understanding of the key aspects and concepts of their discipline of informatics, including some at the forefront of the discipline

Analysis, Design and Implementation – First Cycle Degree

Graduates having completed a First Cycle degree should have demonstrated the following capabilities:

- understanding of the feasibility and complexity of informatics problems
- ability to select relevant analytic and modelling methods
- formalisation and specification of real-world problems where informatics forms part of the solution
- ability to familiarise themselves quickly with new informatics applications
- insight into possible application fields of informatics
- identification of application problems in the overall context and know the appropriate solution patterns
- Appreciation of the need for deep domain knowledge in certain application areas and demonstrated their appreciation of the extent of this in at least one situation.
- application of their knowledge and understanding to design hard- and/or software which meets specified requirements
- abstract and deep knowledge in the field of modelling, systems and software architecture and the use of patterns and libraries
- knowledge of all phases of the software life cycle for building new, and maintaining existing, software systems. Selection of appropriate process models for projects concerning traditional applications as well as emerging application areas
- modelling and ergonomic design of user interfaces suitable for application
- selection of programming environments appropriate to the respective problemprofessional creation and thorough testing of software systems
- familiarisation with existing software and application systems and sensible use of their elements

Technological, Methodological and Transferable Skills – First Cycle Degree

Graduates having completed a First Cycle degree should have demonstrated the following capabilities:

- the ability to combine theory and practice to solve informatics tasks
- undertaking literature searches, and use of data bases and other sources of information
- the ability to design and conduct appropriate experiments, and interpretation of data and conclusions
- understanding of the state of the art technologies relevant to the informatics specialisation and of their application
- awareness of the impact of informatics solutions in a societal and environmental context
- commitment to professional ethics, responsibilities and norms of informatics practice
- recognition of the need for, and engagement in life-long learning

Other Professional Skills – First Cycle Degree

Graduates having completed a First Cycle degree should have demonstrated the following capabilities:

- ability to develop an approach relevant to any application without which core competence in informatics cannot fully develop in practice
- consideration of the economic, social and legal conditions expected in informatics practice
- awareness of project management and business practices, such as risk and change management, and understanding of their limitations

- ability to effectively function as an individual and as a member of a team
- independent organisation of their own work
- problem solution using informatics in a cost-effective and time-efficient way
- basic knowledge in estimating and measuring expense and productivity
- creation of solutions appropriate to the available resources (time, personnel, etc), which come up to generally recognised quality standards and are accepted by all participants
- effective communication with colleagues, (potential) users and the general public about substantive issues and problems related to their chosen specialisation; communication competence to convincingly present ideas and suggested solutions in written and verbal form

3.1.2. Learning Outcomes for Second Cycle Degree (SCD) Programmes

Underlying Conceptual Basis for Informatics – Second Cycle

Graduates having completed a Second Cycle degree should have demonstrated the following capabilities:

- profound knowledge and understanding of the principles of informatics
- either a deepened knowledge of a chosen specialisation or broadened knowledge of informatics in general
- critical awareness of the forefront of their specialisation

Analysis, Design and Implementation – Second Cycle

Graduates having completed a Second Cycle degree should have demonstrated the following capabilities:

- specification and solution of informatics tasks that are complex, incompletely defined or unfamiliar
- formulation and solution of problems also in new and emerging areas of their discipline
- application of the state of the art or innovative methods in problem solving, possibly involving use of other disciplines
- ability to think creativity to develop new and original approaches and methods

Technological, Methodological and Transferable Skills – Second Cycle

Graduates having completed a Second Cycle degree should have demonstrated the following capabilities:

- integration of knowledge from different disciplines, and handling complexity
- comprehensive understanding of applicable techniques and methods for a particular specialisation, and of their limits
- awareness of the limits of today's knowledge and knowledge understanding practical application of the state-of-the-art technology
- respective knowledge and understanding of informatics to create information models, complex systems and processes
- ability to contribute to the further development of informatics

Other Professional Competences – Second Cycle

Graduates having completed a Second Cycle degree should have demonstrated the following capabilities:

- independent work in their professional field
- good managerial abilities and effective functioning as leader of a team that may be composed of different disciplines and levels
- effective work and communication in national and international contexts
- systematic approach to risk management

3.2 Accreditation Criteria

In addition to the learning outcomes, Euro-Inf has developed Guidelines for the Criteria and Requirements of Programme Assessment. Accordingly, each informatics programme for which a Higher Education Institution seeks accreditation or reaccredidation against Euro-Inf standards must be consistent with legal and national requirements and have in place:

- programme educational objectives consistent with the mission of the Higher Education Institution, the priorities of the HEI Department and the needs of all relevant stakeholders (such as students, relevant employers, informatics associations or societies, etc.) and programme learning outcomes consistent with the programme educational objectives and the specified programme learning outcomes for accreditation (cf. Sections 1.1 and 1.2 of the Euro-Inf Standards);
- a curriculum and related processes which ensure achievement of the learning outcomes;
- academic and support staff, facilities, financial resources and any cooperation agreements with industry, research institutions and/or other Higher Education Institutions necessary to deliver the learning outcomes;
- appropriate forms of assessment which can validly attest to the achievement by graduating students of the programme learning outcomes;
- a management system able to ensure the systematic achievement of the learning outcomes and the continual improvement of the programme.

Correspondingly, the guidelines for a programme assessment submitted for accreditation must at least specify the following items: Programme Needs, Objectives and Learning Outcomes; Relevant and Effective Educational Processes; Appropriate Resources and Partnerships; Adequate Assessment of the Educational Process; and an Effective Management System.

The detailed criteria to be assessed within this framework and the associated “requirements” are listed in the form of questions, valid for both FCD and SCD programmes that should be addressed when assessing an informatics programme for accreditation. They are available at the Euro-Inf Website [3].

4. The First Trial Accreditation Procedure in Tuzla

4.1 Background: TEMPUS Project for Quality Assurance

Accreditation is increasingly becoming the second most important cornerstone of the quality assurance in education, next to self-evaluation of the university. Starting with the aforementioned reform objectives, as well as the role and importance of accreditation system within a country’s education system, one of the objectives of the project entitled „Qualitätssicherung von Studiengängen durch Akkreditierung“, within Tempus UM_JEP-19015-2004 project, is to contribute to the establishment of an adequate accreditation system in Bosnia-Herzegovina, a system that would suit the current and future practice of university autonomy, the role of the state and politics, as well as meeting the needs of both the economy and population of Bosnia-Herzegovina. Partners in this project are amongst others the University of Paderborn, Germany (coordinating partner) and ASIIN, Germany, the University of Tuzla, BH, University of Banja Luka, BH, University „Džemal Bijedić“, Mostar, BH, University of Sarajevo, BH.

Global project objectives are as follows:

- Motivation for the implementation of the Bologna process and education reform in BH
- Increase in quality standards, flexibility and innovative capacity of the university in BH
- Internationalisation of higher education in BiH.

Given the congruent objectives of Tempus and Euro-Inf, it has been decided within the Tempus consortium, and upon the invitation of Euro-Inf project, for the universities in Tuzla, Sarajevo and Mostar to implement a test accreditation procedure following the Euro-Inf standards, for their programmes of study in the field of informatics. The Faculty of Electrical Engineering of the University of Tuzla is the first to have initiated the implementation of a test accreditation procedure in BH of all the abovementioned universities for its Programme "Technical Informatics".

The programme is designed for a regular study period of eight semesters. The traditional cycle of 5 years / 10 semesters was abandoned and the Bologna two-cycle model introduced at the University of Tuzla in 2003. The model chosen uniformly by the University of Tuzla schedules 4 years for the first cycle, 1 year for the second cycle. Graduates of the Bachelor programme have thus collected 240 credit points (CP) by the end of their studies.

4.2 Preparation of Self-Evaluation Report and for the On-Site Visit

The management of both the University and the Faculty of Electrical Engineering has been informed of the test accreditation procedure being initiated. A team has been formed to prepare a self-evaluation report, comprising the members of the Tempus team at the University of Tuzla. Two Deputy Deans of the Faculty of Electrical Engineering, Chief of Cabinet of the Rector, as well as two members of the teaching staff have contributed to the making of the document. While writing the report, the team met once or twice a week during two months, in order to coordinate the activities and resolve any possible uncertainties and problems. Documents prepared by University and Faculty served as a starting point for the report, as well as a large number of reports and other relevant data normally used and analysed with an aim to improve the quality of studies. The self-evaluation report was finally submitted on 31st May 2007.

4.3 Visit

The on-site visit for the Bachelor programme Technical Informatics took place at the University of Tuzla on June 18 and 19, 2007, on which occasion meetings were held with the self-evaluation report team, the University management, the Dean and his Deputy, as well as the teaching staff and students. The accreditation report prepared by the peer group was sent to the University on 12th September 2007.

The fundamental benefits of the test accreditation process for the University of Tuzla and the Faculty of Electrical Engineering are as follows:

- Raising awareness of the necessity of accreditation of the study programmes at higher education institutions in BH
- Acquiring knowledge of self-evaluation report-writing, and the accreditation process implementation procedure
- Acquiring knowledge of elements valued within the accreditation of a study programme
- Training of project team members in the field of accreditation of study programmes
- Observation of study programme's shortcomings as early as report-writing

- Awareness of the necessity of preparing additional documents in order to describe a study programme in more detail (module description, learning outcomes, etc.)
- Introduction to the external assessment of a study programme as a basis for dealing with shortcomings observed
- Staff determination and willingness to implement the actual accreditation in the future.

The Euro-Inf Standards and Criteria helped us to get a clearer idea on the certain aspects of our study programme, especially when it comes to programme objectives and outcomes. Technical Informatics study programme offered at the Faculty of Electrical Engineering in Tuzla is characterised by a strong foothold within Electrical Engineering as a traditional core discipline of the University, and therefore does not completely fit programme objectives and outcomes defined in Euro-Inf Framework Standards and Criteria.

Some of the peer group report's recommendations have already been adopted by the Faculty while preparing the new curricula that are to be applied as of the 2007/2008 academic year. In contrast to what was practiced before the assessment, credit points are now awarded for the preparation of the Bachelor's thesis as required by the ECTS system; the module descriptions were complemented and now include descriptions of learning objectives. The initiative has been made for providing a detailed definition of the student practice (industry placement). Student mobility is an aspect that will, for some time, still not be applied at the universities in BH, due to the lack of rules and regulations governing the field, as well as the inconsistencies of informatics programmes of study at our universities.

5. Lessons learned for the Euro-Inf Project

After this insight into the provisions to be made by a HEI in the context of a trial-accreditation visit, as well as the positive impetus the outcomes of the visit may have on the further development of a study programme. In this final chapter, the perspective is directed back to the Euro-Inf Project and the lessons learned from its first testings and refinements. It is examined in how far the first application of the Euro-Inf Standards and Criteria has confirmed their applicability and validity, and where room for improvement could be discovered.

5. 1 Lessons Learned from the first Trial-Accreditations

The trial accreditation visits conducted so far showed that the Euro-Inf Framework Standards and Criteria are generally perceived as useful and applicable by both the HEI and the panel members. In some cases, problems arose at HEIs in countries where informatics still is characterised by a strong foothold in Electrical Engineering and the programme objectives mainly focus on the education of engineers and not informatics/computer science. In those cases it was evident that the Euro-Inf learning outcomes would not be fully met by the graduates of the programme. Following this reasoning, one could even put into question the suitability of the Standards and Criteria for an assessment of the specific programme.

Yet, Euro-Inf has abstained from the attempt to exclusively define criteria for the eligibility of programmes to participating in a Euro-Inf assessment procedure. The current approach is to leave the decision to the programme coordinators: If they believe that the programme's learning objectives are in line with the Euro-Inf programme outcomes, they may decide to apply for Euro-Inf Accreditation.

During the visit at Tuzla University, all participants were aware from the beginning of the fact that the study programme "Technical Informatics" did not represent the typical European computer science programme. The main goal of the trial accreditation, however, was not to award a quality label. It was considered worthwhile to conduct the review, because both assessment team and HEI hoped that the final recommendations by the team would support

the university in reforming its study programme. As a result, the future the learning outcomes of the study programme might be closer oriented at the Euro-Inf learning outcomes and thus their graduates would have better chances when competing with graduates of other (national and European) universities on the job market.

A second issue where room for improvement was identified concerns the applicability of the Euro-Inf learning outcomes for the first cycle. The panels visiting the universities of Tuzla and Mostar had the impression that outcomes required as “Underlying Conceptual Basis for Informatics” [4], and specifically the key aspects and concepts of informatics should be defined more precisely. This and some smaller issues concerning the procedural guidelines and the composition of the auditing team will be discussed by the project partners in December 2007. In the forefront of this meeting, any constructive feedback from relevant stakeholders to be addressed to muth@asiin.de will be highly appreciated.

References

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4 Euro-Inf Framework Standards and Accreditation criteria for informatics Programmes, p. 3.