

# Results and dissemination of the EIE-Surveyor thematic network

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**Abstract**— The EIE-Surveyor ERASMUS thematic network ran from October 2005 to November 2008. Competences, accreditation, quality and Bologna process were among the main aspects which were focused on, in the disciplines of Electrical and Information Engineering (EIE). The main results of the project are three books, freely available to all the colleagues and students interested, presenting the existing curricula in EIE in Europe, the situation of the implementation of the Bologna process, mobility aspects, and a state of the art and proposition about accreditation in conjunction with a quality approach. The dissemination strategy which was used for this project is also described in this paper.

## I. INTRODUCTION

Acting as a *Reference Point for Electrical and Information Engineering* in Europe, EIE-Surveyor ([www.eie-surveyor.org](http://www.eie-surveyor.org)) was proposed by the EAEEIE (European Association for Education in Electrical and Information Engineering, [www.eaeeie.org](http://www.eaeeie.org)) in order to work on some key-points, when dealing with Comparability of curricula and diploma recognition, in order to emphasise the mobility of students and the mobility of workers.

After three years of common work, within a partnership of 110 Higher Education Institutions, results of the project are available, as three books which are published and sent to many target groups. The results of the project can also be downloaded <http://www.eie-surveyor.org/cd/>.

1. (Under the co-ordination of A.E. Ward) - *"The alignment of Generic, Specific and Language Skills*

*within the Electrical and Information Engineering discipline"*, Ed. EAEEIE, Nancy-Grenoble, September 2008, 188 pages, (ISBN 2-9516740-2-3).

In this book is proposed a list of competences in EIE, implementing the European TUNING [1] [2] [3] transversal approach; this aspect is very important when considering accreditation and recognition at the European level. The value of the Tuning Methodology and of the analyses carried out has been demonstrated by this project task and the specific findings point clearly to areas where more work can be undertaken.

2. (Under the co-ordination of M.J. Martins & J.M. Thiriet) - *"Overview of the Bologna Process - Implementation in Europe in Electrical and Information Engineering"*, Ed. EAEEIE, Nancy-Grenoble, September 2008, 538 pages, (ISBN - 2-9516740-3-1).

This book proposes two reference papers on the implementation of the Bologna process at the bachelor and master and at the doctoral level. A study on the mobility in EIE is also proposed.

The second part of the book is constituted of a presentation of the situation of the implementation of the Bologna process in EIE in Europe in each country, with updated data, compared to the previous version of the book, published in 2003 [4].

3. (Under the co-ordination of D. Pasquet and D. Deniz) - *"Quality and Accreditation in Europe: implication in Electrical and Information Engineering"*, Ed. EAEEIE, Nancy-Grenoble, September 2008, 79 pages, (ISBN - 2-9516740-4-X).

The book consists of two parts. The first part is dedicated to the Quality Assessment of Resources in EIE Available through the Internet. The second part concerns an analysis of the existing accreditation procedures, and proposition of a methodology.

The present paper is divided into five sections. The next section reminds some figures regarding the project, the next following sections describe the three main books, outcomes of the project, and a last section deals with the dissemination strategy. The end of the paper will propose conclusion and perspectives.

## II. PRESENTATION OF THE PROJECT

The EIE-Surveyor thematic network project (EIE-Surveyor: Reference Point for Electrical and Information Engineering in Europe – Project Nr. 225997-CP-1-2005-1-FR-ERASMUS-TNPP) ran from October 2005 until November 2008.

The objectives were the following:

- Reflection on generic **competences** and subject-specific competences in Electrical and Information Engineering (EIE) with application of the TUNING approach [1] [2] [3] [5],

- Implementation of **quality assessment** methodologies on some educational resources available in EIE [6],
- Reflection and proposition of a methodology for **accreditation**, in order to enhance comparability and common certification procedures [6],
- Proposition of a census of the existing curricula in EIE in Europe, the multinational degrees, and the situation of the implementation of the **Bologna-process** in EIE, at the **bachelor**, **master** and **doctoral** levels [7].

This project was composed of around 110 partners representing the whole Europe.

## III. ALIGNMENT OF GENERIC, SPECIFIC AND LANGUAGE SKILLS IN ELECTRICAL AND INFORMATION ENGINEERING

This task of the EIE-Surveyor project has been dedicated to the application of the Tuning Methodology to the Electrical and Information Engineering discipline area. This report presents the approach taken to this application and an analysis of the results obtained from a pan-European survey of students, academics, graduates and employers. In total 3,275 completed questionnaires have been received and entered into a single SPSS dataset.

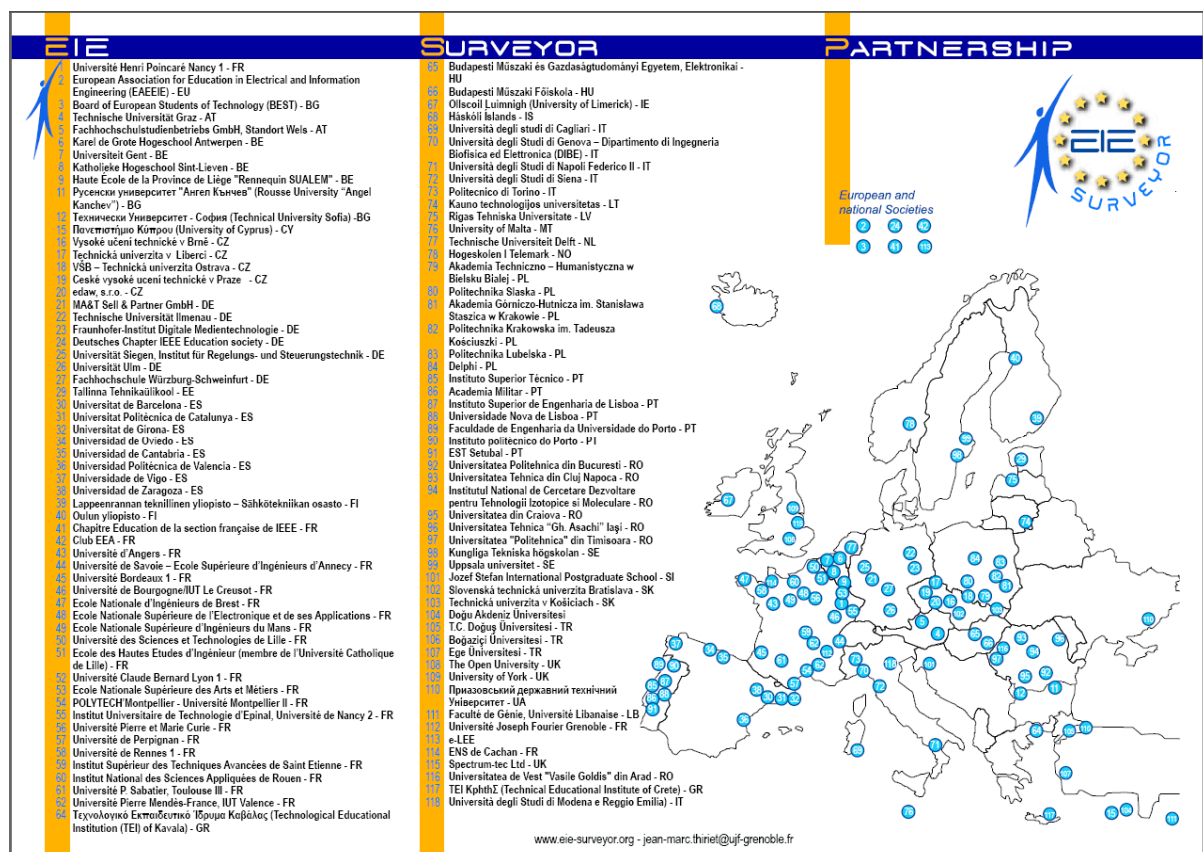


Figure 1: Partnership of the project

The responses have enabled analyses in a number of different ways to be carried out including comparisons by gender, academic study level, country and by competence both individually and in groups they form through the application of standard statistical data reduction techniques. Attention has been paid to the clarification of the scope of the EIE area as the boundaries between technical degrees and broader arts degrees are blurred in places.

The project has confirmed the appropriateness of the Tuning Methodology to the discipline area and, in line with other Tuning studies, has shown that the results do differ between countries and that clustering of countries does occur in some analyses.

The analysis shows that, in terms of general preparedness for employment academic typically over-rate while students generally under-rate their view on how well they are preparing students relative to employers. This perhaps reflects a general optimism of employment potential by academics and pessimism by students. In general employers and academics rate competences higher in importance than students and graduates, even allowing for the unevenness in the average responses of these different stakeholders. The most important generic competence is problem solving followed by elementary computing skills and knowledge of a second language. A number of differences between rated importance and level of development of the competences emerge providing evidence that adjustment of curricula would be beneficial. Finally the analysis shows that the English language is the only second language that is rated as anything more than weakly important. This view is shared by all stakeholder groups.

The value of the Tuning Methodology and of the analyses carried out has been demonstrated by this project task and the specific findings point clearly to areas where more work can be undertaken. There are gaps in the data for some countries and for some stakeholder groups within some countries. It is recommended that attempts are made to fill these gaps so that the analysis can be extended to be more representative of the whole of Europe. The issue of clustering needs to be examined in more detail and a focussed study in this area may reveal some interesting European country clusters or some regional differences.

This book is composed of 198 pages and is downloadable from <http://www.eie-surveyor.org/cd/>.

#### IV. ACCREDITATION AND QUALITY

A first analysis shows that some countries have not yet introduced a formal accreditation process. These countries are generally in a transition situation in relation to introducing the Bologna process. The accreditation process, ECTS and the quality assurance measures will probably be introduced at the same time.

In some other countries several accreditation bodies exist depending on the region (in Germany according to the Länder) or the nature of the institution (in France between universities and Grandes Ecoles). It also appears that the accreditation for masters and PhD degrees is not yet compulsory everywhere.

Other issues regarding the accreditation process that are also being considered include the payment of the expenses in relation to the accreditation process. This point is important in the countries where the accreditation process is not paid by government. Also, the relation between the ECTS and the actual content and level of the courses is being considered. This issue is larger than the goal of this task, but it is a very important question for the mutual recognition of the curricula. Finally the issue of whether industrial placement is compulsory and for how long must it last is being reviewed.

The following achievements have been made on the issue of quality of e-resources available over the Internet:

- A quality assessment methodology has been developed for evaluating online e-learning resources available through the Internet.

- The quality assessment methodology is implemented in two main parts:

- the creation of an electronic catalogue (e-Cat), and
- the application of an evaluation questionnaire/survey (e-Surv) for users.

- The e-Cat serves the purpose of cataloguing e-resources available in the field of Electrical and Information Engineering over the European Internet area and making them available to learners across Europe and beyond. The e-Surv is an e-Cat resource linking questionnaire comprising evaluation in the four sections previously mentioned. e-Surv is designed to allow continuous assessment of the quality of e-resources available within the e-Cat by means of user surveys.

- The quality assessment methodology, containing both the e-Cat and the e-Surv sites, will be maintained under the umbrella of a professional organization, such as the EAEEIE, beyond the lifetime of the project.

This book is composed of 76 pages and is downloadable from <http://www.eie-surveyor.org/cd/>.

#### V. BOLOGNA PROCESS IMPLEMENTATION IN EUROPE

The construction of the European Higher Education Area before 2010 is the aim of the Bologna process. Since then follow-up conferences in Prague (May 2001) and Berlin (September 2003), have reviewed some of the initial objectives.

A three-cycle system was established, with a common accreditation system – ECTS.

The first cycle, entitled Bachelor should not last more than 4 years, with a number of credits varying from 180-240 credits. The second cycle – Master, after the first degree, should require 90-120 credits (300 credits for the bachelor + master). The third cycle- Doctorate, should not last longer than 3 years.

The true revolution of the Bologna process also known as the BMD (Bachelor-Master-Doctorate) process is that the teaching-learning process is focused on learning outcomes, rather than on syllabus, with the learners as the focal point of the educational strategy.

The use of learning outcomes to define the syllabuses means that the content of a specific course is expressed as knowledge, competences and skills acquired, rather than on information delivered. ECTS are based on workload rather than on face-to-face class hours. Two initiatives have defined a framework for the establishment and development of the educational process and qualification system - the Dublin Descriptors and the Tuning project.

At present, the situation still presents a varied profile, since some countries have already applied in full the Bologna recommendations whereas others are still discussing the implementation.

An overview of the process allows the conclusion that a convergence of Higher Education Degrees has been attained at this level. The 3 cycle BMD system is used now in most European countries and the crediting system ECTS is applied in all the countries that have signed the declaration.

The Doctorate level is the one that is still under revision and presents more changes between the old and the new framework.

While the implementation of the Bachelor and Master's degrees according to the Bologna process, began in 2000, the situation of doctoral studies only arose in 2003, since access to this third cycle required a successful completion of the second cycle.

A previous study [4] showed that there were big differences in the doctorate in Europe, concerning duration, financial supports and duties, as for example complementary classes and seminars that are compulsory in some countries and non-existing in others, or with respect to duties as lecturers.

The Bologna-follow-up conference in London in May 2007, was an important step towards the reflection of the evolution in doctoral studies. The main objective is to promote a closer alignment of the European Higher Education Area (EHEA) with the European Research Area (ERA), with the aim of improving the quality and competitiveness of European higher education.

An overview of doctoral studies, shows that there is a recent trend to include, besides the thesis research work, additional lectures, seminars, summer-schools, etc. that are particularly oriented at the needs of doctoral candidates [8]. Some ECTS credits are awarded for attending these events. The total workload of these events during the doctoral phase might be 50 to 150 hours in the average. It must not exceed this time in order not to put at risk successful research work.

It would be impossible to summarise a complex situation such as the evolution of European Higher Education in a short paper. For a deeper information on the subject, please refer to the EIE project website (<http://www.eie-surveyor.org>). The new publication on the evolution of EIE syllabus evolution in Europe has been published in September 2008 [7]. A detailed analysis per country is available in that publication.

As a conclusion we might say that the main objective of introducing a two cycle basic formation in EIE has been applied in most countries in Europe. The crediting system is

now for the most part based on ECTS, which facilitates the inter-institutions recognition of diplomas and student mobility.

Doctoral studies have lagged behind and there is still a lot of controversy, namely on the weight of independent research work and the mandatory inclusion of seminars and courses also credited by ECTS.

This book is composed of 556 pages and is downloadable from <http://www.eie-surveyor.org/cd/>.

## VI. DISSEMINATION

The last stage of the project has been reached, which consists in disseminating the results of this project. Three main actions were achieved during the project: participation of partners to conferences and meetings and presentation of EIE-Surveyor, use of the website of the project and sending of the results of the project, as a CD, to around 1500 institutions.

### A. Participation to conferences

During the 3 years of the project, more than 150 papers (to be updated for the final version) have been presented to international conferences. Some specific dedicated sessions have been organised, in particular in the previous EAEEIE Conferences in 2006, 2007 and 2008. Several national actions, such as in France for example the actions achieved within the Club EEA ([www.clubeea.org](http://www.clubeea.org)) working groups allows to share the activity of the project at a national level to other institutions, even if they are not partners of the consortium. The EIE-Surveyor project was also presented each year during the Club EEA Annual congress, which regroups between 100 and 200 participants, so that the French national community knows the project. The same kind of actions were achieved in other countries.

### B. Website of the project

The EIE-Surveyor website ([www.eie-surveyor.org](http://www.eie-surveyor.org)) was used as a working website during the lifetime of the project, it is now transformed into a dissemination website, which means that it is now outcome-oriented and also that any kind of people interested can find all the documents of the project from this website. Everything is freely downloadable.

### C. Dissemination of the results over 1500 institutions

Taking the opportunity of the huge consortium of the project (110 partners), we decided to disseminate the results of our project to higher education institutions, government institutions and ministries, economic partners (companies, newspapers...).

CDs containing the outcomes of the project together with flyers describing the projects were disseminated this way.

Some CDs and flyers were also distributed during conferences, meetings of other projects, or informal meetings. As a whole, 3000 CDs and 10 000 flyers were distributed mainly in Europe, but also outside Europe.

Austria	6
Belgium	61
Bulgaria	26
Cyprus	1
Czech Republic	69
Danmark	5
Deutschland	96
Ellas/Greece	86
España	107
Estonia	47
Finland	19
France	350
Hungary	12
Ireland	18
Italia	96
Latvia	23
Lithuania	11
Malta	1
Nederland	2
Poland	59
Portugal	123
Romania	39
Slovakia	18
Slovenia	4
Sweden	3
United Kingdom	123
Iceland	1
Norway	16
Switzerland	2
Türkiye	71
Western Balkans	2
Community of Independent States	12
Afrique du Nord	1
Middle east	5
America Latina	5
North America	12
Asia	4
TOTAL	1688
TOTAL feuille 1	1633

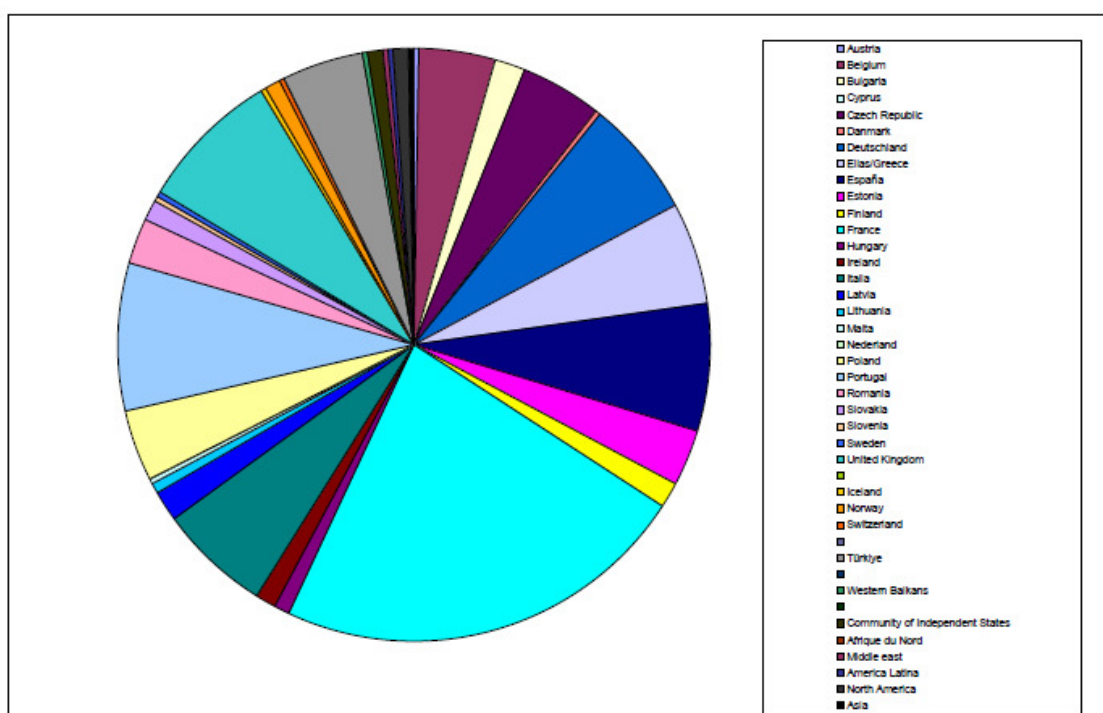


Figure 2: Dissemination among institutions

## VII. CONCLUSION

This three-year period was an exciting experience, working as a group of more than 100 institutions (the number of active partners is more about 60), trying to analyse the evolving situation regarding higher institutions in Europe, and trying to make some propositions and advices, concerning the future of HE in Europe.

Despite a policy of about 20 years encouraging mobility of students and cross-recognition of degrees and diplomas, and despite a strong encouragement of the European Commission not to converge, but at least to focus on a more easily readable format of study (Bologna process), we can observe that a lot of activities were achieved but also that a lot of points remain to be done.

It is now more or less broadly accepted (except from some reluctant colleagues!) that it is good for a student to spend at least one semester abroad during her/his studies, this will open this future European citizen both at the professional level and the human dimension.

The studies done during EIE-Surveyor showed some remaining locks:

- The non-direct compatibility of the Bologna-process-based new curricula organised in Europe (for instance bachelors with 180, 210 or 240 ECTSs).
- The fact that the mobility during the studies is not so easy, despite of ERASMUS. The recognition of courses spent abroad by a student should be prepared and validated for each student, each situation, which means a lot of energy and in some cases no success... In some universities it is simply impossible (except for

some projects) because each mobility should be explicitly part of the accreditation process, which is not practically achievable...

- The generally non recognition of diplomas: the diploma remains a national affair, with national accreditation bodies and procedures, and it is almost impossible to have a diploma well recognised in a first country to go and work in another one. Also for studies, it is not easy to have a bachelor level recognised in a first country in order to go for a master course in another one.

What is missing in order to actually succeed in this mobility-based model is the existence of a European accreditation body, which gives the HEIs the possibility or not to deliver some diplomas, according to some rules which are to be known. Each HEI in Europe should be accredited by this European accreditation board. In this situation, the case of the common or join or multiple diplomas could be facilitated, when the accreditation is done at a European level ...

In the accreditation procedures, the mobility should be encouraged and an open process should be implemented in order to facilitate mobility.

The reports [5] [6] [7] are the main outcomes of the project. The sustainability of the project is ensured thanks to EAEEIE and also to the acceptance from the European Commission of a new **ELLEIEC** project.

#### ACKNOWLEDGMENT

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