EVALUATION OF STUDENT INDUSTRIAL PLACEMENTS ABROAD

Claude Maury[1] and Peter Moson[2]

Abstract — *The results of the EU Leonardo pilot project MESIPA ("Methodology for the Evaluation of Student Industrial Placements Abroad") coordinated by Claude Maury will be presented. The issue was investigated by a consortium of the following member institutions: CEFI /Comité d'études sur les formations d'ingénieurs/ a French body related to engineering education, and 5 higher educational institutions with important engineering training expertise: FH Karlsruhe, Germany; ETSIIM Madrid, Spain; Lulea University, Sweden; Loughborough University, England; BUTE Budapest, Hungary. The PRACTICAL GUIDE, containing as main elements: (i) Reports about the situation of the practical placements in the listed above 6 countries, universities; (ii) Typology, general attitudes toward placements; (iii) Legal, financial, cultural dimensions; (iv) Examples of the good expertise, case studies; (v) Code of good behavior; (vi) Evaluation, will be discussed. The objective of the project and the paper is to initiate, to strengthen partnerships interested in industrial placements in general, and especially abroad.*

Index Terms ¾ Practical placements, International cooperation, evaluation, guide.

INTRODUCTION

There is a clear trend everywhere in Europe, to increase the importance of placements within engineering education, when they exist (France, Germany, Sweden, UK), or to introduce them if they do not exist (Italy, Spain, Hungary). Such an evolution has roots in the academic world, where studies are often seen as too theoretical, but also in the corporate world, where a new stress is put on competencies - or generic skills - which refer to concrete abilities of staff members to do something in a specific context.

There are indeed two philosophies of engineering education around the world:

- Engineering education mainly seen as an opportunity to get the necessary basic knowledge, and related know-how, the acquisition of practical skills being delayed to a training phase (UK) or to a first experience (US),
- Engineering education being built up as a coherent process, where graduates receive at the end a full title of engineer (Mainland Europe, e.g. France or Germany), introducing them into a professional status.

The growing interest given to placements corresponds to a more modern approach (according at least to the opinion of the MESIPA consortium members) where some "clinical" periods, - the young student being forced to behave in real situations - are associated to classical courses. The integrated industrial placements bring a clear added value to traditional engineering education:

- They provide a precious help to consolidate the acquisition of methods (solving problems abilities), which cannot entirely rely on class-rooms presentations,
- They give a true meaning to basic courses (students understand better why theoretical matters are taught),
- They give an opportunity to young students to better understand the way corporate firms function, and which qualities are praised to be efficient in such a context (students will be better prepared to professional life and more mature),
- They represent a new and fruitful area of cooperation between industry and the academic world, enabling the engineering schools to better understand what is going on in the professional world, the corporate world to evaluate and attract would-be candidates, small and medium sized industry to better grasp technological evolutions.

A complementary trend linked to the emergence of an international job market is the development of industrial placements abroad. This move is in pace with an increasing mobility of young students, who more and more see a clear interest in an experience within foreign companies. Educational institutions have no other choice than to follow that trend.

The aim of this paper is to call attention to the output of the MESIPA project (born by its members and IAESTE France) by highlighting the "Practical Guide on International Placements and Assessment", which is going to be produced as a promotion tool and advisory document on main aspects of industrial placements in general and especially abroad.

[1] Claude Maury, CEFI, 7 de la Rue Lamennais, 75008 Paris, FRANCE, Claude.Maury@wanadoo.fr
[2] Peter Moson, Budapest University of Technology and Economics, H-1521, Hungary, moson@tutor.nok.bme.hu

THE PRACTICAL GUIDE

Why a guide on students placements? How to use it?

The guide has been designed by CEFI + IAESTE France and a network of 5 European Universities of Technology (University of Loughborough, University of Karlsruhe in applied science (FH), Luleå University of Technology, University Polytechnica de Madrid /Escuela de Minas, Budapest University of Technology and Economics). It aims to be useful to various actors, from higher education institutions to companies, without forgetting students.
It should be used as

- a **source of information** (on placement practices and rules in 6 European countries /typology/, addresses and reference documents),
- a **source of advice** (specific guidelines and recommendations for organizing international placements, methodology on placement assessment),
- a **benchmark material** (a collection of study cases showing placement experiences and best practices in 6 European countries).

The final guide, which has still to be finalized, will be placed on the internet (there will be at least an access from the homepage of CEFI, http://www.cefi.org). It is supposed to be an efficient tool in the promotion of student placements, and should contribute to their quality.

Why to Develop Placements Abroad?

This basic question was investigated from the viewpoints of the main participating actors. Placements abroad appear to be linked to various motivations, which underline some complexity of the process:

- **corporate world** see placements mainly as a source for international recruitment or as an access to fine technological or language skills, Europe becoming a pool of human resources,
- **educational institutions** involve themselves to gain an international dimension, to improve their image, and to answer students mobility expectations,
- **students** take it as an opportunity to increase their employability, to get a human experience, a higher maturity, intercultural skills, to be more open-minded and to discover the wide World .

Variety of Placements

The practical placements exist in many forms. According to their objectives they can be for example,

- blue collar placements (students employed as a worker having the opportunity to discover social realities, often in summer as replacement),
- integrated placement (engineering / higher technician, higher added value /clear educational dimension),
- support for a final project work in industry (first confrontation with actual problems),
- experience periods in alternative engineering education

In case of placements abroad, one may find:

- national placements schemes simply transferred into a foreign company and country (optional, same technological requirements as for national placements),
- Specific placement periods abroad focused on the international education of the student (compulsory, specific placement objectives, often around 3 months),
- Placements abroad as part of long duration international study programmes (one year abroad programmes /academic + industry/, double degree programmes, foreign language engineering programmes).

Trends in Europe

Some common European elements (e.g. length /longer placements/, advanced level privileged by companies, project work within industry) are formulated and investigated. It should be underlined the importance of differences (optional / compulsory, forms of assessment and validation, monitoring etc.).

Specific national features (which are useful to know) related to the 6 participating countries are discussed (length variations, level, status, legal aspects, financing students on placement, organisation, placements agreements and contracts, services in charge of placements at universities, search for placements by universities or by the students themselves etc.).

Managing Placements Abroad

The most frequently asked questions and problems (e.g. How to find placements abroad? , How to follow-up students abroad? , How to appreciate and ensure the quality of placements abroad?) have been addressed according current practices. Crucial factors of success have been identified, such as

- Preexisting networks of foreign academic + industrial partners,
- formal agreements (placement contracts, behavior charts),
- capitalization of experiences of former students in foreign companies, of foreign students present in the university, of companies welcoming students;
- well updated data bases on partner companies and housing possibilities abroad,
- readyness to devote time to the follow-up of students and to trustful relationships with companies,
- preparation of the students to avoid misunderstandings and failures (which are more damageable in the case of placements abroad).

Assessment

The crucial role of assessment is investigated for all 3 main actors' expectations (enterprise, university, student) and the quality assurance of the whole process.
Concerning the practical placements these are the following:

- the academic institutions are interested in efficient organization, quality of the placement, assessment of the student, to foster relationship with industry,
- the corporate world needs efficient organization, a balanced cots-benefits, testing the trainee as potential candidate,
- the students want to meet academic expectations, no major material concerns, an actual experience which will have a prize for further employment, a better personal knowledge.

Any assessment process will have to address all these points, i.e. to deal simultaneously with an classical academic dimension, a quality dimension – with some formal requirements - and long-terms effects.

In case of international placements specific points (as cultural dimension, linguistic skills, strong human experience /personal development/) play role as well.

There exists different validation methods: academic validation through a mark or credits, sometimes as a pass-failed process, academic validation within the degree/ or through an additional award, validation as a professional experience.

For placements abroad some additional criteria can be applied and a specific award , certificate or label : e.g. "Europass Formation" launched by the European Commission.

Conclusion, Case Studies

The final part of the guide contains recommendations (e.g. about networking, formalisation of partnership), reference materials and case studies from the practice of the participating institutions. Here as an example a part of BUTE experience is included (for more information see http://tutor.nok.bme.hu) :

Case study 1. French Filial.

The French Filial of Budapest University of Technology and Economics (BUTE) is a classical (10 semesters) engineering training leading to a university diploma (Dipl. Eng.). The language of education in semesters 1-4 is French. The students receive a French certificate (DEUG, delivered by INSA de Rennes) as well.
The training contains a compulsory blue collar (observation) internship. Some students (optional) prepare their mandatory diploma work (final project, 10^{th} semester) in the framework of a foreign engineering internship. Details:
Observation (blue collar) internship (min. 4 weeks after the 2^{nd} semester in summer in France):

- Objectives (for the students): to provide the first impressions about a foreign enterprise; to develop language, communication skills; introduction to the French culture, style of life.
- Organization: The internship is organized by the University (the responsible is a young French worker, status financed by a foundation). The number of companies involved is more than 20, they represent different professional fields, regions etc.
- Financial questions: The money paid by the companies normally does not cover all the costs (travel, accommodation, living, cultural expenses, insurance etc.). Every year BUTE has to find additional sources.
- Assessment, accreditation, feedback: It is a criterion subject for the certificate DEUG. The students prepare a written report about the placements, and defend it before a committee (consisting of industrial and academic members). This oral presentation and the following discussion contain feedback elements as well.

Engineering internship (3-5 months in the 10^{th} semester abroad):

- Objectives (for the students): to prepare the final project at an foreign enterprise; to develop language, communication skills; knowledge about the French culture, style of life.
- Organization: The companies involved represent different professional fields, regions etc. Some preparatory work toward the students is carried out by the university as well.
- Financial questions: The costs (management, travel, preparatory work, scholarship) are partly covered by EU Leonardo project.
- Assessment, accreditation, feedback. A defended (before a State Examination Committee) diploma work (final project) is a compulsory criterion in the Hungarian engineering education. The activities of the 10^{th} semester are evaluated by 30 credit points.

Case study 2. Alternative ("sandwich") education.

The alternative education is a relatively new (the first students started their studies in an experimental phase of this training in 1996) educational form at BUTE. The main idea is the adaptation of a successful French educational form (provided by CNAM - Conservatoire National des Arts et Métiers) to the Hungarian situation. The training contains 2 (a technical and engineering) internships of duration 6 months and supervised by a double (enterprise - university tutorship). The training was presented at the previous ICEE conferences [1-2]

ACKNOWLEDGMENT

The authors on behalf of the whole consortium of MESIPA project acknowledge the European Union Leonardo da Vinci program for the support related to the presented activity.

REFERENCES

[1] Sol, Ch., Moson, P.: "Strengthening the Links between Enterprises and Universities". Alternative Training of Engineers. *Proceedings of ICEE'99*. See http://www.ineer.org .

[2] Sol, Ch., Moson, P.: "Alternative Training of Engineers. Extension." *Proceedings of International Conference on Engineering Education (ICEE 2000).*