

The Pedagogic Importance of International Exchanges of Students and Teachers

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Abstract - In the present-day world, the globalisation is becoming more and more important, which is especially true for the modern technology and the related industry. It is therefore extremely important that young people, especially engineering students (and, of course, their professors), become aware of this process and accept it, thus becoming true and active members of the international engineering community. To this end, international exchanges of engineering students as well as teachers between different higher education institutions are promoted by different international programmes, such as the European Union's Lifelong Learning Programme and its sectoral sub-programme Erasmus. Following his own experiences from the participation in the Erasmus programme, the author analyses the principal benefits, as well as some problems encountered when participating in such exchanges. Among the former, the possibility of choosing one's own study programme, the promotion of inter-cultural dialogue and tolerance, and the experience of acting in different environments will be stressed, while among the latter, the language problems, the incompatibilities between different programmes and evaluations of students' and teachers' work, as well as the lack of financial funds, will be emphasised. The procedures and solutions adopted by the Lifelong Learning Programme will be presented as an example.

Index Terms – Erasmus sub-programme, Lifelong Learning Programme, Students exchanges, Teachers exchanges

INTRODUCTION

At the end of the 20th and at the beginning of the 21st century, the world is becoming more and more globalised. Accordingly, people must be becoming more and more aware of the international environment they are acting in. This is especially true for the engineering community, due to the internationalisation of engineering research, production and economy processes. The internationalisation is most effective if it concerns young people, especially students. Hence, the engineering education must be oriented more and more internationally. This internationalisation does not mean only temporary contacts between individual people and institutions, but also regular exchanges of both students and teachers of different education institutions from different countries.

One must be aware that the term internationalisation does not at all mean only visiting foreign countries and mastering foreign languages, its essential components being

knowledge and estimation of different cultures and societies, tolerance for them, as well as the ability to live and work in internationally different environments.

There are several international programmes stimulating international cooperation and exchange in the field of higher education. One of them, especially emphasised in this paper, is the European Union's Lifelong Learning Programme (previously called Socrates programme) with its sectoral sub-programme Erasmus.

In the rest of this paper, the European Union's Erasmus programme will first be presented. Then, some salient advantages and benefits of international exchanges in the field of engineering education and some problems in the implementation of such exchanges, as well as possible solutions to them, will be exposed. Both stem from the author's several years of experience as the coordinator of Erasmus activities at the University of Ljubljana, Faculty of Electrical Engineering, as well as an active participant in teachers exchanges. The implementation of the Erasmus programme at the author's home institution will also be presented.

As the author of this paper is coming from a small European nation, his thoughts expressed in the paper may not be meaningful for some non-European, or even for some European large nations, especially for those with the English as their mother tongue. However, many of the statements expressed here are valid for the majority of international exchanges.

EUROPEAN PROGRAMME LIFELONG LEARNING / ERASMUS

The European Union's Lifelong Learning Programme is the successor of the highly successful Socrates programme with the goal to "contribute through lifelong learning to the development of the Community as an advanced knowledge society and to foster interchange, cooperation and mobility between education and training systems within the Community" [1]. This citation expresses some of the salient advantages of international exchanges that will also be emphasised in this paper.

The lifelong learning programme is composed of four sectoral sub-programmes, among which the Erasmus sub-programme [2] is devoted to achieving the objectives of the Lifelong learning programme in the field of higher education. Erasmus already was a sub-programme of the Socrates programme.

Some of the most important specific goals of the Erasmus programme include increasing the number of international exchange students to at least 3 millions by 2012, increasing the compatibility between higher education

degrees within European Union and intensifying the cooperation between higher education institutions.

The Erasmus programme supports several actions, among which the following achieved most success until now: mobility of students for the purpose of studying, mobility of teachers for the purpose of teaching, and placements of students in foreign institutes and enterprises (until now, the latter activity was partially covered by the programme Leonardo da Vinci).

Within the frame of student mobility, a student can do some of their study obligations (attend courses and pass exams, or work on a project, like diploma or placement project) during a certain period (between three and twelve months) at a foreign education institution or enterprise (in case of a placement). If this learning programme was agreed upon in advance between the student and their home and host institutions, the work must be acknowledged and recognised by their home institution, as if it were carried out at home. The amount of student's work at a foreign institution is measured in terms of credit points as defined by the European Credit Transfer System (ECTS) [3]. Within the frame of teacher's mobility, a teacher can visit a foreign higher education institution during a short period (one through eight weeks) if their teaching there is a part of the regular educational programme of the host institution.

The Erasmus bylaws define three basic roles of the programme to support the above activities: they concern organisation, coordination and financing of Erasmus activities. Erasmus documents define the rules specifying all necessary procedures, according to which all Erasmus activities have to be carried out, as well as the organisational structure, consisting of educational coordinators and administrative support that both allow for smooth course of Erasmus activities that conform to Erasmus rules. An important part of the rules is supported by the above mentioned European Credit Transfer System that allows the students' work to be measured and evaluated and hence different educational components and programmes to be combinable and comparable. The programme also financially supports all the Erasmus activities, such as international exchanges. Students exchanges are financed in the form of so-called Erasmus scholarships, and teachers exchanges are financed with Erasmus grants.

THE IMPORTANCE OF THE INTERNATIONAL EXCHANGES OF STUDENTS AND TEACHERS

There are three kinds of participants of international educational exchanges: students, teachers and educational institutions.

Of course, students are the most important participants. Although their primary goal when visiting another educational institution is to study there, i. e., to attend courses and pass exams or to work on a project that is a part of their educational programme, this is not at all their only goal. In this section, a list of possible benefits of international student exchanges, though not an exhaustive one, will be given.

- According to modern concepts of education programmes, a student can select as much optional

courses as possible, at least in later years of their study. Of course, if they can select among the courses of not only their home educational institution, but also among those of foreign institutions, the possibilities for selection are huge.

- In most cases, a student uses a foreign language at a foreign institution, sometimes even two of them. Although more and more European universities opt for English as the teaching language of choice, students often learn at least a few phrases of local language to ease their staying in the country and to facilitate their contacts with local people. In this way, their linguistic skills and their linguistic culture are improved.
- When staying abroad, a student comes in contact and comes to know other cultures, other environments, and other ways of life and work. Most importantly, they acquire respect and tolerance for these differences, and they become more flexible and able to quickly adapt to different environments. There is not only the difference between a student's own culture and the culture of the host country, there are also differences between the cultures of many students coming from different countries to a single host institution.
- Inevitably, a student encounters, during their staying abroad, several unexpected situations to which they must quickly adapt. In this way, they become more flexible and ingenious.
- More generally, a student can become, during an extended period abroad, more broad-minded and aware of the global nature of humankind and civilisation.
- By tackling and overcoming both expected and unexpected obstacles, a student becomes more aware of their own potentials and self-conscious.
- Hence, it is clear that a period of staying abroad is an excellent experience, one could say a "school of life", for a future intellectual, such as an engineer.

The advantages of international exchanges for teachers are similar to those experienced by students. Higher education teachers usually are also researchers, hence the advantages of their visits are twofold; however, in this paper, we will be more interested in the benefits of international exchanges from the educational aspect. Some of the most important benefits are listed below.

- A teacher lecturing in a foreign language improves their oral ability and ingenuity in this language.
- Pedagogic processes can be different at different institutions. Coming to actively know different teaching processes and educational programmes somehow stimulates a teacher to compare them against those used at their home institution and to try to improve them.
- After having visited several foreign educational institutions, a teacher is more experienced which improves the quality of their teaching at home institution.
- A teacher also can benefit from their contacts with foreign cultures which results in a more balanced attitude towards different students.
- Regular contacts with foreign institutions are mandatory not only for a researcher, but also for a teacher.

- An internationally oriented teacher serves as a good example for their students.

Certainly, there is no good educational institution with bad students and bad teachers. Therefore, all the benefits of international exchanges of students and teachers, as listed above, are beneficial for the institution, too. Furthermore, good students and good teachers visiting a foreign institution, represent there their *alma mater* and raise its reputation.

PROBLEMS ENCOUNTERED AND HOW TO SOLVE THEM

International exchanges of students and teachers have been running for many years, so a lot of experience has been gathered in this field. In addition, exchange programmes, such as the European Union's Lifelong Learning / Erasmus programme provide for well-defined rules according to which exchanges are carried out. Above all, the idea is superb and more and more students participate in such exchanges with enthusiasm. However, in practice, several problems are encountered. In this section, some of these problems will be listed and possible solutions to overcome them will be discussed. As the author of this paper has been acting as an Erasmus coordinator at his home institution for many years and also visited several French engineering schools as an Erasmus teacher, the problems encountered and their solutions may somehow be biased by the Erasmus programme; however, they are deemed to be more general.

Language

The language diversity and the learning of foreign languages are among the key concepts supported by international exchanges. However, there are some linguistic problems encountered in exchanges, especially in case of student exchanges.

Nowadays, the English is becoming more and more widely used in international relations, especially in the area of engineering. So, the majority of internationally oriented journals, and virtually all the international technical conferences use the English as the language of communication. Consequently, the majority of higher education teachers worldwide can understand and speak English, and many of them are fluent in it. To stimulate engineering students to be able to communicate in English and thus be better prepared for a possibly international career, many universities and other higher education institutions all over the world use the English language for regular teaching. However, many of them insist on using the local language on the grounds to develop and maintain the local technical language and to prevent the English to prevail over the local language within the engineering community. Although this argument is to be very seriously considered and respected (e. g., the English terms "software" and "hardware" are used all over the world!), some compromises are also possible. For example, in Europe, when the Bologna reform [4] is enforced, the local language could be used in the first cycle, and the English in the second cycle of the Bologna framework. Additionally, the local technical language could be developed by national technical journals and conferences.

Of course, a student or teacher visiting a foreign institution must be able to communicate in a foreign language (either English or local language of the institution) in most cases (with exceptions, such as exchanges between Great Britain and United States, or France and Belgium). In different cases, however, different levels of foreign language command are necessary.

As was already told, most higher education teachers can communicate in English, so teachers most usually use this language for teaching at foreign institutions. However, one must be aware that the level of language command must be high, unless the quality of teaching will be rather poor.

Students that work on a project (such as a diploma project) at a foreign institution usually use the English (unless they master the local language of the visited institution). Although there are sometimes problems because of the low level of students' English command, on general this knowledge is not so critical - the conversation being mostly person-to-person (student - mentor) in this case.

The linguistic problems can be much more serious in case when students attend lectures and pass the exams. In this case, the student's command of the language used in teaching must be good enough as to be able to follow the lectures and understand the exam questions. As the English is currently the mostly spread language, those institutions that use the English are most appropriate to accept foreign students. As they are also the most wanted (for this same reason), it is sometimes quite difficult to visit them. The institutions that use well-spread languages (like German, French or Spanish) also can receive foreign students from some parts of the world, even if they use the local language. The educational institutions of small nations have but two choices: either to use English as the teaching language, or to receive only those foreign students wanting to work on a project.

Tuition Fees

Some higher education institutions charge foreign students (as well as domestic ones) with tuition fees that may be prohibitively high, and some do not. So, unfortunately, some students might have to renounce their favourite destination just because of the tuition fee that is too high. Although almost everybody would agree that it is worth paying more for a better programme, the problem might be especially burning in case of mobility from poor countries to rich countries. Within the frame of the European Lifelong Learning / Erasmus programme, all exchanges are assumed to be bilateral (at least in average), so there are no tuition fees for Erasmus exchanges.

Selectability of Courses

We have mentioned already that, according to modern concepts of study programmes, as many courses as possible should be selectable, especially during the later years of study. However, one must be aware that high selectability means a lower number of students per teacher, which is by itself very good and facilitates student exchanges, but implies a higher price of study programme; hence, only rich institutions can afford it.

Compatibility of Programmes

If a student attends courses at a foreign institution the compatibility of the two study programmes is of key importance. Unfortunately, the educational programmes in different countries are not always compatible. That was one of the reasons for the Bologna reform to be undertaken to unify the meaning of different degrees and the framework of study programmes at least in Europe, and thus facilitate international student exchanges within the Erasmus framework.

However, if a student goes to a foreign institution to attend courses there and pass the exams, it means that the student can actually select their own study programme. In this respect, it is advisable that such exchanges take place as late in the study process as possible, to attend at the host institution, as much as possible, the optional, rather than the mandatory courses. In case some mandatory courses (that usually treat the basics of some technical area) are selected, they can only serve as the substitution for similar courses at the home institution. If optional courses are selected, such a correspondence to home-institution courses is not necessary; they only must fit into the study concept of the student's programme and require an adequate quantity of work.

The quantity of work is measured by the so-called credit points. While within the European Union and the Erasmus programme credit points are standardised by the ECTS [3] system, credit points at some other countries, if used, may have a different meaning. In case when the quantity of work is not standardised, the quantities of work at the host and home institutions must somehow be compared. As an orientation, the quantity of work needed to pass a semester or academic year can be taken. In European Union, one semester is worth 30 ECTS credits, and one academic year is worth 60 ECTS credit points.

The compatibility of the individual programme selected by a student must be confirmed in the form called Learning Agreement by the home institution. In the Erasmus case this is confirmed by the Erasmus coordinator at the home institution. At the author's home institution (University of Ljubljana, Faculty of Electrical Engineering) this is done by the mentor - a teacher of the Faculty's department responsible for that particular student. In any case, before a student goes abroad, their study plan, specifying the courses to be passed at the home institution and those to be passed at the host institution, must be clear.

Recognition of the Students' Work Done Abroad

If a student attends courses and passes exams at a foreign institution, all of this work, if in accordance with the previously signed agreement between the student and their home institution, must be recognised by the latter. In such an agreement used at the author's home institution and approved by the student's mentor, the work to be done at the host institution and that to be recognised by the home institution, are specified. Of course, no more work (as measured in credit points) can be recognised that is actually done abroad. It often happens (e. g. because of sabbatical years not previously foreseen) that a student must change their plans when already abroad. In such a case, e-mail is used (to speed

up the procedure) to obtain the mentor's consent for the changes of the plan.

As already mentioned, a student also can go to a foreign institution to work there on a diploma project. At the University of Ljubljana, Faculty of Electrical Engineering, a student works on their diploma project for several months under the supervision of their mentor, then writes the report and supports it against a committee of University teachers. If they work on the diploma project at a foreign education institution, they can write the report and support it either at the home or host institution. What will actually be done must be specified in the learning agreement. In either case, they must have a mentor at the home institution to supervise and approve the work.

Evaluation of Students' Achievements

The work done by a student at a host institution must be evaluated.

There exist different evaluation systems at different education institutions. However, they can be classified into two groups which are not compatible. In one system, the mark a student is awarded is proportional to the quantity of the knowledge they demonstrate. In another system, the mark awarded to a student relates to the distribution of the success shown by members of a group of students. An example of the latter evaluation system is the one proposed by the EU's European Credit Transfer System (ECTS) [3]. In this system, besides the negative mark "F" and the conditionally positive mark "FX" (where a student is given the possibility to upgrade his mark to a positive one), there exist five positive marks, namely "A" through "E". "A" is awarded to the best 10% of the positively evaluated students, "B" is given to the next 25%, "C" to the next 30%, and "D" and "E" to the next 25% and 10%, respectively. Of course, such a system, based on statistics, is reasonable only if a sufficient number of students are evaluated; in the ECTS document [3], the minimum number of 20 is recommended. In any case, however, the delimitation between what is positive and what is negative must be well defined.

When recognising a student's work done at a host institution, the home institution must sometimes translate marks from one system to another. Such a translation system can not always be fair to all students, but must be well defined and fixed for all students. At the University of Ljubljana, the positive grades 6 through 10 (proportional to the students' knowledge demonstrated) are used. For the translation from ECTS system, the following translation rules are used: "A"→10, "B"→9, "C"→8, "D"→7, "E"→6.

Evaluation of Teachers' Achievements

Teaching a short course or a part of it at a foreign institution requires a lot of efforts in order to prepare and carry out the course. A visiting teacher should therefore deserve some kind of recognition from either their home or host institution, their activities being advantageous for both. By these words, the author by no means thinks about a financial compensation. Unfortunately, such a recognition does not at all always occur. That might be one of the reasons why teaching staff mobility is not so popular as is the student mobility where a student's work is recognised at the home

institution. Quite rarely, at least in the Erasmus framework in Europe, a teacher visits a foreign institution for the sake of teaching at the first place.

Financing

Visiting a foreign education institution for a period of time can of course be much more expensive than staying at home institution, both for students and teachers. Students and teachers must therefore look for additional financial resources to allow them to go abroad. On one hand, this fact favours some of them over the others, based on their possibility to access financial resources, rather than on their talents and industry. On the other hand, the average costs of living in different countries strongly influence students' destinations.

Within the frame of the Erasmus programme, the European Union financially stimulates international exchanges of students (with scholarships) and teachers (with grants). Unfortunately, this financial support is usually not sufficient for travel and accommodation costs. This is one of the reasons why not all of the students willing to go abroad can afford it, and many teachers look for other means to visit foreign institutions (e. g., research visits or international conferences).

EXECUTION OF THE ERASMUS PROGRAMME AT THE UNIVERSITY OF LJUBLJANA, FACULTY OF ELECTRICAL ENGINEERING

In relation to the implementation of the Erasmus programme, the author's *alma mater* and employer, Faculty of Electrical Engineering of the University of Ljubljana, Ljubljana, Slovenia, has some characteristics which might be interesting also for some other participants of the conference. Slovenia is a small country, with only about 2 millions of inhabitants. Hence, Slovenian language is spoken almost nowhere outside of Slovenia. Furthermore, it is quite difficult to be learnt by foreign people. Slovenia has been participating in the Erasmus programme for almost 10 years, at first as a candidate member state, and now as a full EU member state.

During all this time, the interest of our students for Erasmus exchanges has been steadily growing. At first, students preferred to work on their diploma projects abroad. Now, they prefer more and more to attend courses and pass exams. As almost all young Slovenes can actively speak English, the English speaking countries are preferred. Unfortunately, British universities do not seem to be very interested in the collaboration with us within the Erasmus framework. As many students also speak German and Spanish, Austria, Germany and Spain also are quite popular. Several students also go to some non-English speaking universities with English as the language of teaching, such as in Sweden or Czech Republic.

The participants of all exchanges must strictly admit to Erasmus and our internal rules. An outgoing student can have a status of Erasmus student only with the obligation to gain at least 20 credit points in one semester or at least 40 credit points in one academic year (i. e., two thirds of the normal quantity). Indeed, most of them gain more. Detailed

Erasmus and internal learning agreements are signed as an obligation for both the student and the Faculty.

At the Faculty of Electrical Engineering of the University of Ljubljana, all courses are taught in Slovene language, partly due to the legal requirements, and partly due to the fear of some professors that the use of English in teaching could stop the development of Slovenian technical language. Therefore, it is not feasible to accept foreign students to attend courses and pass exams. On the other hand, our institution is becoming quite popular for students willing to work on a diploma or placement project. In this respect, French engineering schools must be mentioned at the first place, many of them urging their students to do at least a part of their placement abroad.

Potential incoming students fill a form "Search for mentors" based on which the coordinator tries to find for them a mentor and a place in a lab to be able to work on their projects. Our mentors are stimulated to receive foreign students, both by a small financial grant paid to them by the Faculty, as well as by the fact that foreign students, especially good ones, represent a temporary workforce in their labs.

The teachers exchange activities have been quite steady for most of the time, with most exchanges carried out with France, Germany and Austria.

CONCLUSION

In this paper, several advantages of international exchanges of students and teachers of higher education institutions were overviewed. Some problems encountered also were listed, and their possible solutions indicated. In conclusion, the language problem, as discussed in the paper, must be emphasised, although the language diversity can also be viewed as one of the benefits of international exchanges. The question of the use of the language for teaching (whether English or local language) is not an easy one to be answered. This paper proposes a combination of both. Furthermore, the problem of how and how much to finance the exchanges still stays open.

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