About SEFI

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Abstract
SEFI stands for Société Européenne pour la Formation des Ingénieurs (European Society of Engineering Education). This society, founded in 1973, is presented on the background of European educational tradition. SEFI is one of two European societies dedicated to the question of engineering education. For a long time, SEFI represented rather the western and northern part of Europe, while its sister organization IGIP (Internationale Gesellschaft für Ingenieurpädagogik – International Society for Engineering Pedagogy) concentrated on Middle and Eastern Europe. Nowadays, the two societies are working together and cover more or less all of Europe. SEFI’s activities, outreach, links, projects, and prospects are described and characterized. SEFI is not just involved with didactical questions. The society also takes an active role in the shaping of the European landscape of engineering education being member or partner of in a number of societies and contributing actively to EU projects.

Keywords: SEFI, IGIP, International Relations, Bologna Process

1. Introduction: About the tradition of European higher education

Europe has a tradition of diversity. In its long history, Europe has never known real unity. There have been eras of large empires – the largest one was the Roman Empire – but none of them ever covered all of Europe. When the Roman Empire split up at the beginning of the so called Middle Age it broke down in a host of small and medium size political units, which had a common background in the cultural heritage of antiquity hold up by the Catholic Church, the only surviving institution of the old order. Thus, diversity became one of the main features of middle and northern Europe. This diversity had first existed in ancient Greece, which was a cultural entity. The Greeks never came near something like political unity but for the ten years of Alexander the Great’s rule at the end of the 4th century BC. And then it was not more than an appendix to a much greater unit.

Separation and tendencies to unite can be seen as the heartbeat of European history. Therefore, it is no wonder that an inclination towards individualism is deeply rooted into each European. When I spent some time in Wuhan (in central China) some years ago, I had contacts with a citizen of that town who once mentioned to me that he could tell me from every person in the square we were overlooking what he was thinking. No European would dare to make such a statement about his fellow citizens.

If there is a tendency of growing together in modern Europe, there may be some doubt whether this movement will be successful in the long run. It is quite interesting to observe that the countries that stand deliberately outside the European Union like Norway and my own country (Switzerland) have an important function in this environment at least in the eyes of a lot of European citizens who encourage us to remain outside and to retain the political possibilities we still have.

This is not really possible: No one can keep himself or herself outside the context. The ‘craziness of the time’ as I like to call it (others speak of the genius of the period) cannot be avoided. Everyone must respond to the demands of his or her time, but nobody can do it successfully but on the background of his or her tradition.

When I travel through Europe I can observe both tendencies: Europe is growing together. More and more things are common, more and more rules are set up by the central political bodies. Yet the people react to this by taking an opposite direction: While Europe tries to grow together, its very center, the Belgian state, is constantly threatened by braking apart. A new kind of nationalism, one might call it folkloristic nationalism is getting momentum; even regionalism plays an important role. Being rooted in one’s region of origin and being a citizen of Europe is not contradictory it is rather complementary, although there are strong political tendencies of uprooting people and making them mobile.

When the European institutions of higher learning were founded during the Middle Ages, they were given the name “university”. This originally meant the community of the teachers and the students. Only much later the term “university” began to acquire the meaning ‘the universe of all sciences’. These universities were international institutions. (The notion of nation did not have the political undertone it has now. The modern understanding of “nation” is a result of the French Revolution). The students came from everywhere. They had no problem understanding each other because beside their vernacular everyone understood Latin, which remained the language of the learned ones well into the 19th century. Boundaries with border controls did not exist. Passports were not necessary when you moved from one area to the next. Of course, every territory had its ruler. But these did not care about the movements of the few.

† 笹57回年次大学会国際セッションブロシーディングスより著者の了解を得て転載しました。
‘intellectuals’ (also a modern word) who tried to get some university education. At the beginning, everything happened under the auspices of the Catholic Church that assured the internationality of university education. This was the unity element in the process; the rest happened largely on an individual base even if the students of the same nation (culture-political background) inclined towards sticking together.

University education therefore was something for a thin minority of individuals for a very long time. Even if universities began to grow during the 19th century into large centers of learning, university education retained its individual touch. This only began to change in the second half of the 20th century when tertiary education started to become a mass phenomenon.

After the 2nd World War, new needs emerged: The war had boosted scientific progress, in the fifties, with the impact of communism, economic growth set in, and the young people were offered new opportunities. They started flocking to the universities. The universities rather quickly lost their position of educational centers for the established elites. The newcomers, often the children of white and blue collar workers, began to revolutionize the old system. This revolution is known in European history as the 68 movement. Part of this movement was directed against the old authoritarian style that prevailed at least in the universities of the German tradition. They wanted more democratic structures, an educational system that was adapted to their needs looking rather like a follow up to the secondary II education than like academic freedom.

The fortress of academic tradition had had its weak points before. Academic freedom was not the same in all the branches. The difference in academic attitudes must have grown with the introduction of sciences (like physics and chemistry) which needed other approaches to learning than reading and discussion. There was not much of academic freedom in technical universities, where ‘hard sciences’ demanded ‘hard efforts’. Thus, there is no wonder that the demands of the students lead to positive results.

In 1972, the international society for engineering pedagogy (IGIP) was founded in Klagenfurt (Austria). One year later, in 1973, a similar effort was taken in Western Europe through the establishment of SEFI, the European society for engineering education. IGIP rooted in the German speaking area of Europe as well as in Eastern Europe (thus taking up something of the old Austrian role of bridge between the west and the east of the continent). SEFI rather centered on western and northern Europe. Both organizations had similar aims: developing the teaching methods of engineering according to modern needs. Therefore they were (and still are) both largely based on the efforts of teachers who wanted to make their own teaching better, more accessible, and more successful. In order to do this they started to meet in annual conferences. They organized themselves in working groups that corresponded to their own activities like mathematics, physics, technology, humanities, and so on. These working groups have developed a tradition of organizing meetings to discuss special topics within the range of their interest. SEFI then had developed a tradition of publishing the proceedings of these working group conferences and seminars. Many of them are still available at the SEFI headquarters. I myself was quite active in the curriculum development group for some time defending the interests of humanities within engineering curricula. Usually, active members of SEFI are linked to one of its working groups in this way.

2. SEFI Partnerships

Beside the teachers of engineering that form the backbone of SEFI, SEFI as an organization entertains partnership with different organizations.

One of them is the partnership with student organizations like BEST. This is a field that the present administrative council wants to develop in order to give students a voice in the development of engineering education. This is the field of SEFI vice-president Kati Korhonen-Yrjänheikki, Director of the Finnish Association of Graduate Engineers TEK. The SEFI Administrative Council is right now occupied with publishing a position paper on this topic. SEFI is much interested in not just hearing the voice of teachers in engineering education but also of the students.

Other SEFI partners are representatives of the industry. SEFI knows industrial membership and thus seeks closeness to the needs of industry in the development of engineering education. Right now a new paper seeking the development of this partnership between SEFI and the industry is under discussion. It is likely to be approved at the Rotterdam annual conference.

Universities and associations can also be members and thus partners of SEFI. There is a special partnership with IGIP that has been held up by a SEFI-IGIP Task force for some years by now. Members of the task force are members of the respective governing bodies. The two societies have developed in different directions, SEFI being rather centered

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1 The acronym stands for the German name of the society: Internationale Gesellschaft für Ingenieurpädagogik.
2 SEFI is short for Société Européenne pour la Formation des Ingénieurs, which is French. The working language of the society is English however.
3 See SEFI Homepage [www.sefi.be](http://www.sefi.be) (‘publications’)
4 BEST stands for Board of European Students of Technology. See [www.best.eu.org](http://www.best.eu.org)
5 The paper aims at involving companies more in the discussion of engineering educational policies combined with the funding of SEFI actions. It is planned to approve the paper at the Rotterdam SEFI annual conference and then publish it on the website.
on the political area, IGIP remaining true to its original goal of developing didactical skills. Of late, the two associations have found a new ground for cooperation. As IGIP has a tradition of engineering education research, it is a natural partner for SEFI and its interest in developing that field. The SEFI-IGIP declaration of intent states that every year there should be at least one common event organized by both organizations. For this year, there was the fourth IGIP regional conference in Biel. Another one will be the SEFI European Forum on Continuing Engineering Education which will be held in Aarhus at the end of October. There the problem of quality development in lifelong learning in theory and use will be discussed. Another element of SEFI-IGIP collaboration is the joint annual conferences that should be held in regular intervals. The first one was the conference in Miskolc (Hungary) in 2007 organized under SEFI auspices. The next one will be organized in Bratislava (Slovakia) under IGIP auspices in 2010.

SEFI maintains contacts with institutions and programs of the European Union. It was a partner with the ERASMUS® Program, with CAESAR® and others. Of late, SEFI was a leading partner in the establishment of the TREE network.

SEFI is also connected worldwide. It is a member and/or partner of several international organizations like IAEE12 and IFEE13. Claudio Borri, then president of SEFI, was the founding president of this association. Others are FEANI14, ENACEE15, and Asibei16 etc. SEFI is also a Partner of national organizations like JSEE.

In spite of all these international links, SEFI is going on with the didactical discussion. Its forum is the annual conference of the society on one hand, on the other one the European Journal of Engineering Education (EJEE). The meetings of the working groups go on, even if a little less intensely than it used to be. Among the still very active groups figure the physics group, the group of continuing engineering education (CEE), and the working group on Curriculum Development. A new working group is dedicated to Research in engineering education. In it, members of SEFI and IGIP are present.

3. Organization

As an organization, SEFI can be characterized as an institution constantly in motion. The presidency changes every second year and every change at the helm implies a shift in style and – to a certain extent – in focus. The president must be a full professor at a technical university. During his/her presidency, he/she is assisted by an incoming and the outgoing president, a role that guarantees a certain counterweight to the just mentioned shifting. There is also a vice president representing the universities of applied sciences who can serve three two year terms.

The governing body of SEFI is the Administrative Council whose members come from all over Europe, most of them representing a university or another institution in the field of higher learning. The members of this council are elected by the general assembly that usually meets once a year during the annual conference.

While the presidency wanders about Europe according to the town of his/her professional activity, SEFI has its legal seat and its office in Belgium. There, Mrs. Françoise Côme has been successfully serving SEFI and all depending institutions as the secretary general for quite some years. At the SEFI office, all the relevant information are gathered and distributed to the members and also to other interested institutions, among them the European Council. Mrs. Côme also coordinates most of SEFI activities.

SEFI regularly publishes reports. The monthly report appears in electronic form. Every second year a printed report on SEFI activities and points of interest is published. SEFI also publishes the European Journal of Engineering Education. This is a bimonthly scientific journal that serves as a discussion forum on questions of engineering education. Its last issue covers topics like

- An assessment of behavioral variables implied in teamwork: an experience with engineering students of Zaragoza University

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6 In 1996 IGIP founded the IGIP ING PAED REGISTER that contains all the names of people that have successfully passed the IGIP ING PAED Curriculum. The Curriculum introduces engineers in the didactical skills necessary for a successful teaching career. The registration however is not compulsory. Introduction courses have become quite usual since.

7 See News@SEFI – May 2009 p. 5

8 See www.ece.be09.au.dk

9 ERASMUS is an European student exchange program of the EU

10 CAESAR stands for Conference of European Schools of Advances Engineering Education and Research. SEFI has published several position papers on it. See www.sefi.be (under ‘reference documents’)

11 TREE is a guide to universities established under SEFI auspices

12 IAEE means International Association for Continuing Engineering Education. See www.iaee.org

13 IFEE International Federation of Engineering Education Societies.

14 Fédération Européenne d’Associations Nationales d’Ingénieurs. See www.feani.org/feaniweb

15 ENAAE European Network for Accreditation of Engineering Education

16 Asibei – la Asociación Iberoamericana de Instituciones de la Enseñanza de la Ingeniería. See www.asibei.org

17 In Rotterdam, the general assembly is going to elect Annette Kolmos from Aarhus University (Denmark) as the first female SEFI president.

18 European Journal of Engineering Education EJEE, Volume 34, Issue 2 May 2009 (ISSN 0304-3797)
• Communication as part of the engineering skills set
• Re-engineering graduate skills – a case study
• Encouraging undergraduate engineering students towards civic engagement
• Communicating your findings in engineering education: the value of making your theoretical perspective explicit
• Developing a framework for work integrated research higher degree studies in an Australian engineering context
• Engineers and their role in public policy: an active learning experience for enhancing the understanding of the state
• Influences on engineering enrolments. A synthesis of the findings of recent reports
• Ethical learning in higher education: The experience of the Technical University of Valencia

These topics cover situations in (respectively) Spain, Finland, Australia, Ireland, South Africa, Australia, Colombia, Australia, and Spain thus illustrating not only the range of subjects presented in EJEE but also the world wide appeal of SEFI.

4. The Bologna Process

Ten years ago, the Bologna Process took off and produced a revolution in the area of higher learning in Europe. The aim of this process was to set a certain common standard in university education in a landscape rich in very different traditions, to standardize the learning process, to reduce study time, and to enhance the mobility of the students. When the European ministers of education signed the paper they did not foresee what they were going to produce. Obviously the fruit just wanted to be plucked. All over Europe, reform activities surged, old traditions were brushed away, and whoever wanted to resist ‘Bologna’ found him/her on the losing side. Slogans like ‘customer focus’, ‘student centered learning’, ‘outcome orientation’ ‘knowledge society’, ‘lifelong learning’ became mottos of the day. Voices that warned about their misleading character got hardly any chance to be heard. Old, well reputed titles like the German Diplomingenieur (Dipl. Ing.) were given up with no real replacement. ‘Bologna just prevailed. What the ministers had decided and the national and regional authorities had passed on was to be implemented by the ‘victims’ of the process, the teachers if not totally, then at least to a large extent. This was especially demanding on the continent that had traditions far away from the Anglo-Saxon one that served as a model to the Bologna reform. A central point of the Bologna Process still largely felt like a restriction is its reductionist approach to higher teaching/learning.

Now, ten years later, things have calmed down to a certain extent, and the effects of all the reform activities can be overlooked.

Universities in general survived the process with minor changes, some of them introducing the ECTS\(^\text{19}\) and the Bologna titles (bachelor, master) without really changing a lot in their overall attitude. The daily routine, however, the teaching/learning style has changed. The pressure on the students is much higher than it was before the reform.\(^\text{20}\) The old tradition of leisurely studies (maybe combined with some student’s job to help pay study expenses) appears to have given way to the collecting of credit points.

The universities of applied sciences adapted their systems in a more thorough way. But even there, a complete adaptation was not possible. What has not functioned so far is the enhancement of student mobility. Ironically, student mobility was no problem for universities from the early time of European Universities well into modern times. Mobility became difficult in the 20\(^\text{th}\) century (after the First World War) and approaches impossibility under the rule of the Bologna system. Therefore, the European Council has started a new initiative under the title EQF (European Qualification Framework) that should it make possible to compare the learning outcomes of European Universities across the whole continent. Whether this initiative that compels all European states to establish a national qualification framework in the context of EQF by 2010 will be a success is open to speculation. In April 2009, a team of professors at the Berne University of Applied Sciences in Biel has organized a conference on the topic together with SEFI chaired by myself. (Fourth IGIP regional conference, see www.ti.bfh.ch/igip).

SEFI has contributed to the implementation of the Bologna process on a lot of different levels. In the last few years, it has notably influenced the decision on the doctorate in engineering saving at least this element of European academic learning from Bologna regulations. This means that it is still up to the universities to decide how a doctorate should be acquired\(^\text{21}\).

\(^\text{19}\) European Credit Transfer System. The notion refers to one of the basic aims of the Bologna Process: Enhancing student mobility. The ECTS points are something like a currency of higher learning, although it is not freely convertible.

\(^\text{20}\) These effects were described in the German magazine Der Spiegel Nr 18/28.4.08 p. 56-89 under the title: Die Studenten-Fabrik (the student factory)

\(^\text{21}\) See SEFI position on the Doctorate in Engineering 2007 (www.sefi.be, ‘reference documents’)
Another recent contribution is the paper on the continuation of the Bologna process that SEFI formulated together with IGIP in the forefield of the conference of the European ministers’ of education in Leuven (Belgium) of this spring. Here, SEFI and IGIP insist on keeping diversity alive: Not all players can be on the same field at the same time, some need more time to adjust to the new situation. They also insist on a critical attitude in the further development of the Bologna process. Some lines out of the document:

Some of the problems faced at the moment are partially due to an aspect of the reform process that must remain preserved: the promotion of diversity as a crucial element in a culture of competition.

And: The signatories to the Bologna Declaration have chosen individual pathways to achieve the underlying aims accounting for the diverse cultural backgrounds. In consequence, a reduced instead of an increased mobility is observed calling for codes of practice to overcome the obstacles without loosing the diversity.

And: The priority for the next decade should be on ensuring effective implementation of the existing action lines, rather than introducing too many new action lines.

5. Diversity

SEFI is an international organization representing a lot of different backgrounds and attitudes. It speaks with one voice in cases like the ones quoted above. Yet it also permits a wide range of viewpoints. In this respect, SEFI is a discussion and action platform. To show what that actually means, let us have a look at the most recent issue of the SEFI biennial report.

One contribution (written by Erik de Graaff, from the Technical University Delft (The Netherlands), SEFI vice president) discusses the most recent point of interest SEFI stresses: Research and Innovation of Engineering Education in Europe:

SEFI aims to support the improvement and innovation of engineering education in Europe. Most decisions concerning higher engineering education are based on tradition and intuition, rather than on scientific insight. To remedy this situation we need research on engineering education. In the European tradition research and teaching belong together since the establishment of the Humboldt University in Germany. Research in engineering aims primarily at finding solutions to practical problems. Research on engineering education is a mixture of engineering and social sciences. It will provide us with the scientific evidence we need for the development of the engineering curricula of the future. SEFI will continue to challenge all relevant parties to contribute to the innovation of engineering education in Europe with both a practical and an academic attitude.

A different view is expressed by Steffen Bohrmann, immediate vice-president, from the University of applied sciences Mannheim (Germany).

SEFI’s merit, SEFI’s focus, is to offer a wide range of services to its members and to European Engineering Educators. Being exposed to next to revolutionary changes taking place in European Higher Education (“Bologna process”, institutional autonomy, competitiveness and “customer focus”, just to name a few), monitoring these changes trans-nationally, making them aware to individual educators, observing their reactions and turning their interests into political action has become a new and decisive role for our society. We have become more political.

A general trend towards commercialization of education is obvious. This is in line with the ongoing reorganization of all social and political structures in our societies to comply with the interests of homo oeconomicus – and no others. All other facets of human life, of humanity proper are being denied or put under the monopolistic rule of economy. What often is called “knowledge society” is the home of painful intellectual poverty.

What are the consequences for the complex triangle formation-education-training?

In German language, there is a single name for this triangle: “Bildung”. Following the great philosophers of the Age of Enlightenment (Immanuel Kant may be the most prominent one); this Bildung is the pivot for human activity. Bildung is a necessary prerequisite for freedom; educated people cannot be cheated by propaganda; they know better, their thinking is free, and freely thinking people cannot be subordinated to dubious rulers forever. Bildung also liberates you from elementary fears: learning that lightning is just an electric discharge, you will forget about feeling threatened by furious gods and having to pacify them by sacrifice of goods, animals – or even humans.

What is Bildung nowadays? If you read modern reformer’s publications on how Tertiary Education

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Institutions should be organized, you find the “complex triangle serving humanity”, as I described it above, reduced to just a commodity. Bildung is something you pay for, you offer it in the Education Market or in Students’ Fairs, institutions have to compete for their customers and have to tailor their programs to rapidly changing needs, they have to adapt to modernisms and fashionable topics, they have to advertise their “products” with colorful websites and leaflets – and their “academic” activities are being reduced to only one focus: making money.

Is this really what we want? Is this really what you want?

In any case, whatever you want: make yourself heard in SEFI, contribute to strengthening our society, help develop our forces and our common interests as Engineering Educators – in order to make us heard in the concert of players in European Higher Education Area.

These two understandings of SEFI do not exclude each other. They just show the different approaches to SEFI their members take. While de Graaff rather sounds like a technocrat making engineering education more effective, Steffen Bohrmann stresses the humanist tradition and the deeply rooted in European belief in individual responsibility that needs more than sheer effectiveness to allow the single person a decent role in the society of humankind. Still, Bohrmann is no ideologue: He sees SEFI as a platform for different attitudes. He seeks the challenge of different approaches in order to understand his own position better.

In the last paragraph of his statement, Steffen Bohrmann while clearly standing on the side of the humanistic tradition expresses the typical European attitude of giving people a voice and being ready to listen to everybody in order to come to good results. By stressing ‘whatever you want: make yourself heard’ he implicitly lives up to that humanistic tradition by avoiding setting up lines of thought or conduct.

6. Conclusion

SEFI is just one little house in the global village, a house representing so many people, so many institutions, and so many interests. From this house, lines extend to a lot of different people and a lot of different houses. There are lines going out and lines going in. SEFI is but one node in a large network. Yet: it is a house with very distinguishable characteristics. People with very different attitudes contribute to its outside and inside features. Institutions of different character help shape it. All the ones who contribute to SEFI know that the global village is not constituted of little boxes on the hillside only different in their color, but of a host of different buildings, different in as many respects as you can imagine. They are similar only in the fact that they belong to the same village. Everybody knows: In a living village, there are not only bakers, chimney sweeps, farmers or doctors. A village is only a true village when it is constituted by a host of different people with different characters and different roles. Everyone contributes, everyone can learn, everyone shapes. SEFI wants to contribute, SEFI wants to learn, and SEFI wants to help shaping not just engineering curricula but our society. SEFI wants to learn from you. May be you are interested in learning from SEFI as well.

7. References

General Information about SEFI can be found on the SEFI homepage www.sefi.be.

Biography

Robert Ruprecht (*1944) has been a language professor (then a professor for communication) at Berne University of Applied Sciences, Technology and Informatics in Biel-Bienne, Switzerland for most of his professional career. From the very beginning on, he has constantly been interested in the reform of the Swiss Engineering schools and thus contributed to their transformation into Universities of Applied Sciences. His interests also centered on didactical questions which led him to active participation in IGIP and SEFI, out of which resulted his current membership in the governing bodies of the two societies. Among his numerous publications (books and articles) there are also quite a few on the field of his scientific topic: linguistics. Over the last twenty five years, Robert Ruprecht has attended a lot of congresses and seminars on engineering education and linguistics across the world, some of them he has hosted. He is also president of the Swiss Association of Professors at Universities of Applied Sciences fh-ch.