

# CHALLENGES IN PRACTICAL TRAINING EVENTS AT AN ACADEMIC INSTITUTION

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## ABSTRACT

Experience tells that practical training in an environment close to the real professional world and visits to installations like NPPs, accelerator centers, research facilities are extremely valuable activities to enhance learning capability and motivation of the students. This contribution reports on the past and future initiatives of AcUAS to offer these possibilities to its own students but also to students coming from universities of the CHERNE network. In view of the relatively small number of students and the increasingly difficult financial situation it is essential to share the possibilities individual partner can offer. The specialization and infrastructure of an academic institution influences the teaching at that institution and thus one has to expect a quite diverse knowledge of the participants. This and other challenges are subject of this contribution.

### **1. Introduction**

The Jülich branch of AcUAS (Aachen University of Applied Sciences) has a long tradition in offering not only study courses in nuclear engineering, nuclear chemistry, radiation protection, and other related disciplines but also dedicated vocational training especially in radiation protection to workers from research, industry, and the medical sector. The activities started in the early sixties together with the launch of the Jülich research center (FZ-Jülich) to educate engineers in those emerging disciplines. In 1971 a new law in Germany introduced the so called "Fachhochschulen" (university of applied sciences), a type of university devoted to offer professionally oriented study courses. Many of the existing engineering schools in Aachen and also the school in Jülich where in this way joined to become the AcUAS. As in many other German institutions the number of students specializing in the nuclear sector decreased despite the fact that job opportunities did not decrease significantly. To counteract

this development already in 2003 a new master program “European Master in Nuclear Applications” taught in English language was introduced. More over contacts to other European universities were intensified. Starting in 2003 with the participation in a joined intensive course (PAN-2 “Practical Approach in Nuclear techniques”) in Prague at the Czech Technical University (CVUT) together with participants from the Haute Ecole Paul-Henri SPAAK, the Universidad Politécnica de Valencia (UPV), and the University of Hasselt. Since then AcUAS either organized training events or at least participated in practically all training events offered by the partner institutions. A list of EU-funded training events organized by the CHERNE partner can be found on [www.cherne.ntua.gr](http://www.cherne.ntua.gr). Over the years quite some experience was gained on how to cope with the additional challenges due the fact that students from different countries having different background are coming together for a short period. Reports on some of these activities have been given on previous ETRAP conferences (e.g. Francois Tondeur et al. at Etrap 2005, [www.euronuclear.org/events/etrap/etrap2005/Thursday-4.htm](http://www.euronuclear.org/events/etrap/etrap2005/Thursday-4.htm))

## **2. Challenges**

### **2.1. Academic calendars in Europe**

A very severe problem is the fact that even though in many publications a European learning space is advertised but obviously no one ever cared to adjust the time schedule of the European institutions of higher education in such a way that there are some time windows where all institutions can send or receive students. The fact that teaching and examination periods vary in Europe also hampers the successful student exchange. If a student arrives in the middle of a teaching period she or he will have no chance to obtain the required credits for that semester or the year.

### **2.2. Academic habits in Europe**

Another problem in making full profit of common training events are the different regulations in the participating institutions. At least in Germany after a period where the word ‘transfer’ in the abbreviation ECTS was taken serious now more and more one is only referring to credits and is very reluctant to acknowledge or better transfer credits obtained in training events at another institution. In the EMINA – study course at AcUAS it is stated in the official study plan that credits obtained in CHERNE activities can be acknowledged as part of the electives.

### **2.3. Funding and Sustainability**

Universities in Germany and certainly in other countries as well have very limited financial resources. State funding in general is restricted to aliment only the national programs. To obtain funding from the EU is increasingly difficult and financial rules are in part not realistic. For example there is a rule that in the framework of strategic partnerships travel costs of participating professors are only reimbursed if they stay at least five working days. This is practically unfeasible if the activity takes place during the lecturing period of the visiting professor, and as stated above, due to the different time schedules all over Europe this is the most probable case that one or more participating partners will have their lecturing or examination period right at that time. The other problem is sustainability. As state universities are financed according to the national study plans they cannot sell these activities easily. Training events in academic institutions are in general not a product like a vocational training course which can be offered on the free market. More over funding periods are very short, so that even if there would be the possibility to transform the activity into some kind of vocational training there would be not enough time to really advertise and implement the course for commercial use. Some of the partners reach sustainability in incorporating the training event into the national study plans. But then the man power to run the course has to be provided by the institutions since there will be no funding (aside from possible ERASMUS agreements) for visiting professors.

### **2.4. Student motivation**

The Bologna process of organizing study courses in a three year bachelor plus a two year master course forces students into a very tight study plan in order to keep the schedule. Again as for the participating professors the activities may coincide with their lecturing or examination period. Thus to motivate a student to attend a course over two weeks with sometimes an uncertainty whether the credits are acknowledged or useful for the own studies is not an easy task. This is why e.g. in Jülich the former JUNCS (Jülich Nuclear Chemistry School) course was split in two courses lasting 5 working days, RADAM (Radiation Detection And Measurement) and MARC (Methods And Applications in Radio Chemistry) organized such that students with a good background in detection methods can just join the chemistry related course others not interested in nuclear chemistry are just following the RADAM part and those wishing to obtain practice in both fields may attend both courses.

### **2.5. Language and Knowledge related Problems**

The common training events attract students from different disciplines having quite diverse knowledge in the field offered. Until recently the CHERNE members organized courses lasting 10 working days. In these courses a mixture of lectures and practical training was offered. At the best the lectures were closely related to the practical activities and in this way leveled the knowledge of the participants. But sometimes it turns out that some students just could not follow the content of the lecture or did not understand the laboratory instructions due to either missing language skills or theoretical knowledge required to perform the experiments successfully. Especially in a five day long course it is difficult to find out if a student who is very quiet has problems in language or in knowledge to follow the course. Working in groups is a big help in this context if the communication between group members is open minded and empathic. A very important role must therefore also be attributed to social events which have to be organized during the activity. In this context an activity which lasts longer than just five working days is advantageous, but funding of social events over the weekend is difficult.

### **2.6. E-Learning**

Some CHERNE members applied successfully to be funded in the framework of an ERASMUS+ Strategic Partnership “Blended Learning in Radiation Protection and Radioecology”. In this project E-learning modules are being created to support practical training events. If this concept turns out to be effective to allow the participants individually to obtain the theoretical prerequisites to fully profit from the practical realization in the training event this might be then an incentive to further invest efforts in creating introductory e-learning modules to training events offered to students from the network and possibly even to interested parties from outside the academic world.

## **3. Conclusions**

Despite the fact that the organization of training events for students from different countries due to limited resources poses a great challenge for the organizing institution and the people involved the positive feedback from the participants and the conviction that the experience having worked in a foreign environment is of high value for the development of soft skills the author encourages all the colleagues to get engaged in this kind of teaching. It would highly be welcome if European institutions would also look into the daily life problems of academic institutions. Helpful would be if funding would not only concentrate on short projects but in case of successful implementations also allow for follow up support. And as a final remark: A “European Learning Room” requires also identical opening hours!