How to initiate and maintain a continuing pedagogical staff development in engineering education

Paper

This paper deals with the experiences, challenges and future perspectives of an organisation like the IPN in Denmark.

The Pedagogical Network for Engineering Education in Denmark, the IPN
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What is the IPN?

Six years ago the institutions for engineering education in Denmark created a unique partnership within staff development – a network called the IPN. The network deals with pedagogical development of academic engineering teaching staff and embraces all 8 universities and colleges in Denmark offering engineering education.
The IPN was initiated by the most pedagogically enthusiastic teaching staff at a few engineering colleges, and it is financially supported by the Ministry of Education.
The idea of establishing a pedagogical network within engineering educations was formulated in `Forslag til etablering af netværk for: kvalitetsudvikling af ingeniøruddannelserne med henblik på pædagogik og didaktik´ 1995, which has unfortunately not been translated into English. Some of the arguments were:

- A natural part of being an educational education is to work on didactic and pedagogical development as part of quality development in general.
- Since the universities offering engineering education already had pedagogical centres, it was realised among the founding fathers of the IPN, that the engineering colleges also needed to put emphasis on pedagogical development.
- The engineering colleges already had some experimental courses for the new teaching staff, but they also needed to establish a closer relation to pedagogical research at the universities as well as exchange of experiences and resources among all the institutions for engineering education.

The objective of the network was decided to be to strengthen the development of the pedagogical and didactic quality within engineering education by:

- initiating and coordinating pedagogical and didactic developmental activities.
- providing education within the field for junior lecturers, lecturers and other teaching staff.
- collecting and disseminating information concerning pedagogy.
- creating a forum for the exchange of ideas and experience from both home and abroad between universities and institutions.

The method
The IPN offers basic education for the new teaching staff lasting for about a 100 working hours, but also courses on continuing pedagogical development for experienced staff and management and pedagogical strategy. Seminars, workshops and conferences focus on important pedagogical issues like assessment methods, quality development, new teacher roles in modern teaching methods, ICT and pedagogy, overloaded curricula etc.

The IPN offers financial support to departments or institutions wanting to develop their teaching methods or curriculum. The amount of money is half of the amount that the department itself spends on the project. All the reports on the projects can now be seen online, which is an attempt to spread new pedagogical ideas.

The IPN publishes a pedagogical magazine called the IPN-nyt, which is distributed to all engineering teaching staff in Denmark.

The IPN is involved in domestic cross-institutional and international networks dealing with pedagogy, and last year IPN was strongly involved in organizing the SEFI-2001 conference in Copenhagen. The European Society for Engineering Education (SEFI) is the European engineering educational organisation especially focused on discussions about planning of education.

After three years the IPN proved to be such a great success, that it was prolonged for another period of three years, still financially supported by the Ministry of Education. This conclusion was based on an assessment report produced by the Governmental Evaluation Centre in `Evaluering af Ingeniøruddannelsernes Pædagogiske Netværk´. In the report p.31 it was concluded that: "…it is hard to believe that the pedagogical process of change within engineering education in Denmark would have had the same depth and comprehensiveness without The Pedagogical Network for Engineering Education in Denmark."

Pedagogical challenges
But there are still tasks to solve, since the students´ identity changes, the expected identity of the wanted workforce changes, as well as the belief of our Ministry of Education on how to teach and learn the best way are all together in a continuing development. These are some of the basic reasons why it is natural to work for resources that can stimulate a constant pedagogical development. But there is more to it.

Do all the engineering lecturers pay an interest in their pedagogical competencies?

- Still some engineering teaching staff thinks that the ability to teach is, or is not, in our genes. In other words, pedagogical development of the staff is not at all necessary – or at least is not necessary enough to be taken seriously. There are more reasons why the lecturers are not open-minded towards methodological changes in their teaching. Therefore we still fight with a major task: How to meet resistance against pedagogical changes, especially among those we use to call the third group – the first group are the fiery souls, and the second group are

those generally interested in pedagogical development of their competencies at a moderate level.

Colleges and research

- Last year our government passed a reform of education policy, which meant a new Danish Educational University as well as an establishment of the so-called Centre of Further Education. To make a long story short, the consequences of the latter part means to the engineering colleges that they will be closer related to science produced at the universities. This is an effort to make a closer relationship with the universities. Some engineering colleges have already made contracts to cope with the new claims, for example consisting of staff exchange agreements. Very close to the requests to become a lecturer at a university, it now takes a PhD or at least 4 years of professional practice to become a lecturer at an engineering college in Denmark.
  Consequently, this is a challenge for the pedagogical development of the engineering teaching staff. It may imply reformation of the strategies for how in service training of the teaching staff is approached, because it must prepare the teaching staff both for professions at universities and colleges, having very different educational traditions depended on whether the institution has scientific duties or not.

Does ICT make our students learn?

- ICT and pedagogy seems to be one of the greater challenges for us, because not much research into the area has been done so far to get a clear idea of what the implications are in the learning process – what should be considered. ICT Learning Labs are maybe an answer to the question. Labs which provide teaching staff with the possibility of getting an insight into the pedagogical consequences of the use of ICT in their teaching, or maybe up-side down, how ICT can support the learning process.

Ways to make teaching staff more interested in pedagogy

- Another challenge is to make the administrators of engineering education realise and recognise that to make pedagogical development prestigious, first of all basic pedagogical skills should be documented when a lecturer is appointed or perhaps a compulsory part to be obtained during the first year of profession.
  At the technical department of Lund University in Sweden they have recognised the need of allocating individual bonuses given for special pedagogical achievements. Those who receive a bonus have had their work evaluated by a special local group. The criteria for being appointed are that the applicants should prove that they work seriously with own pedagogical aims and development. Therefore a challenge for us is that an economic recognition of the fact that money actually means something to the way pedagogy is given priority to by the teaching staff.

IPN in the future

- One of our greatest challenges, which we work a lot on, is a continuation of the IPN in the future, because governmental support is to run out in the autumn of 2003. A policy of the Danish Ministry of Education is to support new developments in our educations. As time passes by and the projects stabilise the government expects the institutions to take over financial responsibilities and completely run the projects themselves, like it has been seen at the so-called international offices at institutions for further education in Denmark. Thus IPN is about to run into its third period of efforts, a transition period, where IPN is also

expected to become independent on governmental support and in stead of to depend on the support of the engineering educational institution only.

- The fact that the universities already have their own pedagogical centres make them less interested in supporting the network in the future, where their representation in the network is to be paid for. Nevertheless, they have made known that they are an external mutual pedagogical centre with the other institutions for engineering education.

How a governmental financed project can be maintained in the future

The institutions for engineering education in Denmark – especially the engineering colleges – maintain that they do not see a future without a pedagogical network. Especially the colleges want their own pedagogical centre, and they seem to be those responsible for running IPN in the future, because the universities already have their own pedagogical centres respectively. But are the colleges ready to invest the necessary time and money? It now seems to be case, since three of the colleges have now initiated an investment in full-time manpower to work with pedagogical development. Let us consider where we are in the summer of 2002.

References:

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More about The Pedagogical Network for Engineering Education in Denmark: www.ipn.dk