BONE Major Achievements

WP02 : WP on teaching

WP Leaders:

Branko Mikac FER branko.mikac@fer.hr

Kevin Heggarty GET kevin.heggarty@telecom-bretagne.eu

WP Objectives

- Spread teaching excellence within and outside BONE by the organization of Masters Schools based upon a common Masters programme,
- collect teaching materials for Masters programme with license for open access,
- investigation of opportunities/obstacles for a permanent multi-partner Masters
- stimulate exchange of teaching materials, lecturers and students,
- application of advanced techniques for spreading knowledge: video lessons, learning tools, teleteaching,
- dissemination towards the New Member States.

Status at start of the BONE-project

The BONE project inherited the curricula and teaching materials for a common Masters programme in Optical Communications and Networks from the previous FP6 NoEs e-Photon/ONe and e-Photon/ONe+. The curriculum contained 8 courses (Light propagation, Technologies and Components, Core networks, Access and Metro Networks, Switching, Network Resilience, Optical Transmission and Spin-off applications), 4950 lecture slides had been collected. Teaching materials ready for open access had been uploaded onto the public part of the e-Photon/ONe+ web site. BONE started with the experience gained from the organization of the 5 summer/winter schools offered to PhD students in e-Photon/ONe and e-Photon/ONe+.

Major progress during BONE-project

During the BONE project, the curriculum for the Masters programme in Optical Communications and Networks has been extended and updated, the curriculum and teaching materials have also been peer-reviewed and corrected to improve their quality. Two new courses on “Optimisation and planning in optical networks” and “Free space optical technologies for broadband applications” have been added.

The teaching material in the BONE Masters collection now comprises 6350 slides, (compared to 4950 in e-Photon/ONe+), organised into 85 teaching modules. 77 contributors from 19 partners were involved in preparing, editing, reviewing and integrating this material. The collected set of slides is estimated to be equivalent to 42.29 ECTS credits (average of 4.23 ECTS credits per course).

All this teaching material is now available for reuse to all BONE partners on the private part of the BONE web site within WP02 section. 36% of the material is prepared for open access according to the Creative Commons Public License and is ready to be published on the public part of project website. In this way a major compilation of NoE expert knowledge will be available for dissemination outside the NoE. The material is already known to be used actively each year across several of the BONE partner institutions.

Three courses from the Masters curriculum were experimentally executed and given to students from several participating universities inside and outside BONE at the BONE Masters Schools organised in Mons (2008), Krakow (2009) and Budapest (2010). Summer Schools were co-located with each of the Masters schools with topics from optical communications and with the participation and presentation of papers by PhD students. All materials from Master and Summer schools, together with students’ papers are stored on the BONE WP02 web site. Masters tutorials and a selection of the Summer School tutorials are also available via the website as video streaming for use in permanent learning.

A special WP02 Task group analysed different aspects of Master studies at NoE partners from 6 different nations and educational systems to identify the practical obstacles to setting up a “real” multi-institution Masters degree in Optical Telecommunications and Networks based on the “virtual” Master courses set up in the e-Photon/ONe and BONE NoEs. A report containing recommendations on how to overcome these obstacles and suggesting routes to setting up such a degree was compiled.

As a result of the teaching links set up between partners during BONE, recurrent teaching exchanges (professors and more recently students) based on modules of the BONE Masters curriculum are now taking place between several partners and at least one double diploma agreement has been set up.

At two of the Masters Schools tele-teaching was successfully experimented with lectures at the host institution being followed by students at other institutions (two sites during the Mons school, three sites for the Krakow school). A simultaneous web-based distance exam was also successfully held across several sites to validate the students’ assimilation of the concepts presented at the Masters schools.

Added value of the BONE NoE

The creation of the Common Masters Curriculum and the provision of corresponding teaching materials have lead to a synergistic effect in improving Masters and PhD education in the field for BONE partners and establishments outside BONE. Teaching materials are already used in teaching by exchange among partners – enabling new courses in new fields to be offered by institutions which do not have the required expertise in-house. This is useful for all partners but particularly helpful for institutions from new and smaller member states.

Cooperation in preparing materials and the experience gained with distance teaching techniques motivates authors to teachers’ and student mobility and the organisation of joint courses. It is expected that use of the Common Masters curriculum and material will increase the frequency of student mobility within the constraints of local educational rules and the possibilities for mobility funding. In addition, the joint work on the virtual Masters curriculum has stimulated initiatives by BONE partners for establishing permanent Masters degrees in the field of optical communications and networks at their institutions.