

2nd Education and Training Sub-group meeting
1st November, 2007. Savoy Place, Institute of Engineering and Technology, London.

Present – Dr. David Carey (DC) [Chair], Surrey University; Otilia Saxl (OS), Institute of Nanotechnology; Dr. David Bakewell (DB), Liverpool University; Dr. Heather Almond (HA), Cranfield University; Professor Phillippe Peyala (PP), University of Joseph Fourier, Grenoble; Mr. Richard Bahu (RB), MNT Academy; Professor Paul Rees (PR), University of Wales Swansea; Professor Ioanis Katakis (IK), University of Taragona, Kshitij Aditeya Singh (KAS), Institute of Nanotechnology.

Apologies – Dr. Steve Dunn (SD) [Deputy Chair] (Cranfield University), Professor Dan Nicolau (DN), (Liverpool University), Professor Derek Chetwynd (Warwick University), Dr. Jim Burnell Gray, Dr. Joe Hriljac (Birmingham University), Professor Mark Blamire (Cambridge University), Dr. Mark Geoghean (Sheffield University), Dr. Meez Islam (Teeside University), Dr. Denis Koltsov (DK), Lancaster University; Dr. G. Battaglia (GB), Sheffield University; Professor Nicholas Harrison (NH), Imperial College; Roni McGovan (RM), Oxford University; Pietro Busnardo, Civen; Dr. Zulf Ali, University of Teeside; Francesco Peiro (University of Barcelona); Dr. Martin Bennink (University of Twente); Professor Steve Wilks(University of Wales, Swansea); Professor Ian Boyd (UCL), Professor Joel Chevrier (UJF, Grenoble), Roos Bruins (TU Delft)

Agenda

1. Welcome by the Chairman
2. Minutes and matters arising from the previous meeting
3. Outcome of the Skills and Training Survey – Discussion
4. SET student awards and implementation – Proposal
5. EU wide workshop in education and training - Discussion
6. White paper : Benchmarking and Accreditation
7. Development of Recognition scheme in UK and Europe: Update
8. Student Recruitment
9. MNT academy : Activities and Future Direction
10. Education packs for children
11. Any other business
12. Date of Next meeting

Minutes

1. DC welcomed everyone to the meeting, introduced himself and his role in the committee. He further went on to elaborate the functioning of the committee and its purpose. Subsequently introductions were made around the table. He expressed apologies on behalf of SD deputy chair of the committee and other colleagues who were unable to attend due to teaching commitments.
2. There were no items arising from the previous minutes.
3. KAS presented an overview of the survey, its outcome and the main recommendations. DC said that the survey was an extremely valuable study which would help Universities in

starting new courses and in developing the existing courses further. PR added that he agreed with DC and that he found it very useful. PP questioned the number of responses against the photovoltaic devices questions, to which KAS responded by saying that it maybe due to the low number of responding companies working in photovoltaic's sector. DC added that it was important to integrate modules in project management, research and development management, and ethics in taught programmes. He further added that the IET will not accredit programmes across the UK due to lack of content matching the UK-SPEC. It was mentioned the Strathclyde Masters in Chemical Engineering incorporated broader skills elements and was an excellent model.

KAS added that there is provision in which more than one Institution can accredit a multidisciplinary programme where the scope of content is vast. DC emphasized that any effort on IoN's part for future accreditation should involve the Engineering Council. OS said that the IoN is in a unique position to offer accreditation of nanomasters, taking into account the broad expertise of the EG alone, and suggested a three year plan to make this happen.

PR stated it was normal practice was to develop programmes based on the benchmarking statements provided by professional bodies. He offered to report back on the blanket accreditation happening in November to the AG. DB raised the point about standard learning outcome from practical experience such as AFM. DC responded by elaborating the process used at Surrey. PP added in the same context that they had developed a relationship with Industry which is beneficial in adopting standard procedures. OS suggested that it might be advantageous if the 'open' facilities in Industry and University could be made available to students. PR agreed by adding that he would be interested. RB said that in some instances, 'virtual' access would be helpful. Open access facilities and their sharing procedure was discussed in greater detail.

***Action Point 2.1** – Institute of Nanotechnology (IoN) to produce a list of equipment available for sharing between Universities.*

4. DC introduced the SET awards for undergraduate students and discussed the whole concept. There was agreement on the importance and usefulness of the awards. DC added that it would also raise the profile of the Institute. He added that such an award would be open to projects in physics, chemistry, engineering and materials. Academics from Universities would submit the project to world leadership forum. He identified that sponsorship for it would be very valuable. OS queried the name of the award and scope, to which DC responded by saying it name could be decided in due course and should not be too prescriptive. The possibility of a European award for master's student was also discussed. IK mentioned that a project existed under framework 6 in which a project conducted by a final year student in two different European countries would be awarded. It was suggested that ESF could be a suitable collaborator for Europe wide awards. It was agreed that an award for the master's student on a European level would be organized. DC suggested that such an award would be implemented by electronic submissions that would be judged by two academics and a representative from the sponsoring company. Various locations and times were discussed. It was agreed that such an award would be held at the end of 2008.

***Action Point 2.2** – DC, IK and KAS to collaborate on the implementation of the SET undergraduate and European master student award in the first instance, and identification of possible sponsors.*

5. KAS mentioned the possibility of a day long Europe wide workshop on Nanotechnology Education and Training, suggested by the European Commission at the launch event in Dusseldorf. It was suggested that session could cover aspect such as mobility of researchers,

sharing of facilities, master's provision, different standards and systems of education across Europe. DC suggested an important topic would be the impact of the Bologna agreement on the UK system of education. OS suggested that such a workshop should begin in the afternoon on the first day ending with the afternoon of the second day. She further added that it could be held as a parallel session in a European Society for Engineering Education conference (<http://www.sefi.be/>). DB enquired about the possibility of web-casting the conference for the benefit of those unable to attend. OS responded by suggesting that it may be possible in collaboration with IET.

***Action point 2.3** – IoN to investigate further on holding a workshop on education and training in nanoscience and nanotechnology endorsed by the European Commission, and possibly in conjunction with SEFI. Benchmarking and accreditation of programmes to be examined at the workshop.*

6. KAS introduced the possibility of producing a white paper investigating the different benchmarking statements and accreditation practices of bodies across Europe, their benefits and limitation with respect to nanoscience and nanotechnology. He mentioned that a European funded projected Eurace was looking into the development of a higher education qualification framework. IK provided an insight into the national higher education frameworks, and their functioning. PP mentioned the framework used by CEA in France, and its functioning. Both IK and PP mentioned that it would be difficult to influence national accreditation methodologies. It was agreed that the best possible way to proceed would be to hold a session at the European education and training workshop bringing together the right experts.
7. KAS provided an update on participating Universities. He mentioned that University of Joseph Fourier Grenoble, University of Technologies Troyes and Heriott Watt University, Edinburgh had recently joined the scheme. Among other Universities considering participation in the scheme were University of Teesside, University of Birmingham, University of Oxford, Aristotle University of Thessoliniki, Universiteit Hasselt, Belgium. DC said that participating in the scheme has been one of the best decisions for Surrey University programme. IK pointed out that it would be important to involve Erasmus Mundus programmes.

***Action point 2.4** - IoN to manage improvements to the Nanomasters website, and provide the promotional plan for the scheme over the coming year.*

8. KAS reported that some programmes had provided feedback on recruitment. HA mentioned that Cranfield had 9 students. PR added that Swansea had 10, lowest in the last three years of running the programme. PR expressed his experiences in recruitment in Saudi Arabia and China saying that there was not adequate understanding of nanotechnology and the fundamental subject knowledge underlying it. DC added that Surrey had nearly two fold increase in applications, with 17 students in the present year. He added that the collaborative training account (CTA) by the EPSRC had been beneficial in bringing UK students onto the programme. The importance and role of CTA's, to be called knowledge training accounts in the future, was discussed in the recruitment. PP mentioned that their programme was structured into 4 curriculums had recruited 40 students in the first year. He added that the programme running in French would be run completely in English from the next year. IK mentioned that collective intake in the current academic year was 24, less than the 36 from the previous year. He added that their programme provides between €2,000 - €6,000 of financial support. DC suggested that industry and organizations such as the DTI should be targeted to inform them that Universities are capable of tailoring programme to the needs. A

discussion was further held on the two different models of modular training used in teaching and their benefits. Global practices in science and technology education such as dispersed campuses and their advantages were also discussed.

Action point 2.5 – IoN to provide a summary of recruitment in programmes with some identifiable trends.

Action point 2.6 – IoN to provide a list of Masters degrees in Europe with a brief description.

9. RB spoke in detail about the MNT academy which has been funded by the Welsh Assembly. He said one of the main remits for the scheme was the training and skills development at the apprenticeship level. A UK wide survey conducted by the academy had pointed towards a lack of awareness within the micro-nanotechnologies community, especially within designer of products. He spoke about the role of apprenticeship from a sectoral perspective and identified the constraints of SME's such as affordability and time. He explained the role of a Beneficiaries Manager and their engagement process. He added that people do not have a very good understanding of MNT in Wales. Training is provided to companies through taster sessions, practical sessions and open access facilities. He mentioned that the programme was mainly focused on Wales and the funding for which will come to end this year. He further mentioned that they would be interested in expanding their activities to UK and Europe in the future.
10. KAS introduced the education pack for secondary school children that is being produced by Institute of Nanotechnology to increase the interest in nanoscience at an early age. He further requested for ideas on integration of knowledge with the national curriculum and names of suitable projects to refer. RB suggested the Hope and Home charity which had produced pack for children education. HA mentioned a project called opening windows on engineering that aimed to increase the importance of chemical engineering to children. DC emphasized the need for tying the packs with national curriculum. PP mentioned that once annually scientists in France address a large public gathering. RB mentioned the Nanocamp run in Germany maybe useful. IK mentioned that awareness was encouraged by the chemical industry in Spain. DC suggested that Vega trust set up by Harry Kroto maybe very useful in such a project.

Action Point 2.7: IoN to consider seeking funding for an annual lecture for school children, and explore ideas from the Education Sub-group.

11. *Any Other Business* - OS added that it was imperative to measure the carbon footprint for all forms of activities related to the IoN and would provide a measure. She also offered Education Sub-group and Recognition Scheme members the opportunity to advertise in NANO magazine at £500 / € 750 for a quarter page (normally priced at £1750 / € 2500).
 12. The date of the next meeting will be organized for the beginning of April to be held in Central London. The date would be decided by email correspondence as soon as possible. DC thanked all participants for attending and contributing to such a constructive day.
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