

***Education Sub-group
Minutes for the 3rd meeting***

William Buckland Room
Geological Society, Burlington House, London, U.K.

Present - Dr. David Carey (DC) [Chair], Surrey University; Dr. Steve Dunn (SD) [Deputy Chair], Cranfield University; Otilia Saxl (OS), Institute of Nanotechnology; Dr. David Bakewell (DB), Liverpool University; Dr. Christiane Norenberg (CN), Oxford University; Roni McGowan (RM), Oxford University; Dr. Vasant Kumar (VK), University of Cambridge; Professor Paul Rees (PR), University of Wales Swansea; Dr. Martin Bennink (MB) University of Twente; Dr. Milo Shaffer (MS), Imperial College; Laura Bellingham (LB), Quality Assurance Agency; Kshitij Aditeya Singh (KAS), Institute of Nanotechnology

Apologies - Professor Dan Nicolau (DN), (Liverpool University); Professor Phillippe Peyala (PP), University of Joseph Fourier, Grenoble; Dr. Denis Koltsov (DK), Lancaster University; Dr. G. Battaglia (GB), Sheffield University; Professor Nicholas Harrison (NH), Imperial College; Pietro Busnardo (PB), Civen; Professor Ioanis Katakis (IK), University of Taragona; Francesco Peiro (FP), University of Barcelona

Agenda for the meeting

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 - 1.2 Student awards
 - 1.3 Workshop with SEFI
 - 1.4 Website changes
 - 1.5 Summary of recruitment trends
 - 1.6 List of Masters programme
 - 1.7 Funding to annual lecture for students
2. Membership of Science Council and ECUK
3. Benchmarking Statements
4. EURACE and UK - SPEC
5. Impact of Bologna Process
6. European Masters student award
7. Code of conduct for Responsible Nanotechnology and Nanoscience Research
8. International collaborations
9. Counselling to students
10. Nanoscience Communication
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0. Welcome and Introductions

DC welcomed everyone to the meeting and introductions were made around the table. DC went on to present the apologies for those unable to attend the meeting.

1. Action Points from the previous meeting

DC asked if there were any comment on the minutes from the 2nd meeting. They were accepted as an accurate representation of the meeting. DC further added that the IET had changed their position on Master of Science programmes in Nanotechnology since the last meeting and are now accrediting programmes.

1.1 Inventory Sharing – KAS presented an overview of the NanoSci ERA project to develop an online database of research capabilities and capacities in centres across Europe, which may be useful to the members of the AG. NanoSci ERA (An FP 6 European Project) brings together national science and engineering funding agencies from across the EU and associated states, which are cooperating in order to limit the duplication of research efforts. The database would allow scientists to be able to determine where suitable equipment and expertise could be found for student and research use. It would allow the user to search by theme, application, technical expertise, or keyword, and provides contact details for each centre. DC raised a question about access to the database, KAS responded by saying that administrator rights would be provided to research centres to input the information.

1.2 Student Awards – DC mentioned that there was a separate action point under which this could be further addressed.

1.3 Workshop with SEFI – KAS provided an update on the prospective workshop on the benchmarking statement. He added that in his discussions with ECUK, Richard Shearman had mentioned they would welcome the workshop and would support it. As a representative on SEFI, Richard Shearman assured that it would be promoted well. KAS added that the workshop could be discussed in detail under item 3.

1.4 Website and promotional plan - KAS updated the group with the changes on the website and that a new promotional plan has been put into place, which is was circulated to Universities earlier. A discussion on promotion took place. DC asked the difference between an exclusive and a featured mail shot. KAS explained that an exclusive mail shot would cover only the Recognition Scheme, while a featured mail shot would have information about other projects and activities in addition. A discussion on promoting the scheme in India and China took place and it was agreed that the NanoMasters website would be promoted on the IoN's NanoChina website and in the NanoChina newsletter. OS offered to circulate the NanoMasters flyer to all course providers for their use. Comments could be incorporated in the next printing

1.5 Recruitment trends - KAS circulated a short summary based on recruitment information obtained from course providers. He added that due to the limited data available, it was difficult to be conclusive but the summary could provide an indicator of trends. A discussion on the various aspects of recruitment for MSc programmes took place. OS commented on increasing the marketing. DC spoke about intakes, factors affecting the intake and prospects of students, as well as the teaching in programmes. PR spoke about the MSc in Nanomedicine and types of students targeted. OS mentioned the IoN was developing courses in Nanomedicine for

professionals and would be pleased to collaborate with Swansea. SD mentioned that a course for nanomaterials for energy applications was being developed. A discussion on funding specially the collaborative training accounts and doctoral training centres. DC spoke about the practices at Surrey University particularly for EngD. SD spoke about the Doctoral Training Centres and also the profile of students. He particularly mentioned the motivation of students in relation to their age, specialism and desire to change careers. The effect of the economy was also mentioned by him.

The funding from the collaborative training accounts was discussed. DB spoke about overseas student market being lucrative and also presented his views on its limitations. For Indian students the lack of laboratory facilities was a favourable factor for students coming to Europe, however with the improving research infrastructure in India he expected it to change. OS added that promotional activity should increase in India. MB spoke about the links with India and his experiences. VK spoke about his collaborative links in India particularly with Professor CNR Rao. He also spoke about teaching at the school levels.

Communication to promote nanoscience and nanotechnology through television programmes. DC and OS spoke about examples of TV programmes. DB presented a publication from the Oxford University Press given out for free in the Independent as an example. A discussion on producing a similar publication on nanotechnology prospectively in collaboration with the Independent newspaper took place. Different outreach methods for encouraging the young and their benefits were also discussed. LB mentioned the BBSRC output on nanoscience. VK added that the best way to target the young would be through educators.

Action point 3.1 – IoN to increase promotional effort to recruit students focusing on India and China, the latter through www.NanoChina.cn

1.6 List of Masters Programmes – KAS presented a list of masters' programmes in UK and Europe. He mentioned that the list comprises of programmes that are not already on the database that is publicly available.

1.7 Funding for annual lecture for school children – OS mentioned that it was ongoing and associating it with the Science festivals would be considered. A discussion on timing was also held. OS mentioned David Holloway as a potential collaborator. The EPSRC call for public engagement was also discussed. Autumn was considered as the most favourable time and a 9 month notice period.

2. Membership of Science Council and ECUK

KAS presented the case for membership of the Science Council and ECUK. The benefit of the membership in supporting the emerging area of nanoscience and nanotechnology through educational and professional development were mentioned. The membership of the Science Council, he added would take 9 months while the becoming a professional affiliate of ECUK would take nearly the same time. The approval of membership takes place at fixed interval in a year. SD supported the case and it was unanimously agreed that it should be taken forward. LB enquired about existing professional affiliations of the programmes, it was mentioned that affiliation in UK were with the Institute of Physics, Institute of Chemical Engineering, Institute of Engineering and Technology, and Institute of Materials, Minerals and Mining. A discussion

on the accreditation of programmes took place. PR mentioned that IChemE and IET jointly accredit programmes at the Swansea. Similarly SD mentioned Cranfield have Institute of Materials, Minerals and Mining, Institute of Physics and Institute of Chemical Engineering accredit. It was agreed that the professional status such as a chartered engineer is attractive to students. Affiliation of educational programmes that eventually lead to chartered status was considered beneficial.

Action point 3.2 – IoN to take the Science Council and ECUK Membership forward

3. Benchmarking Statements

KAS provided an overview of the previous discussions on Benchmarking Statements and the interest is investigating the possibility of relating the existing M-level statements (Engineering, Physics, Chemistry, Pharmacy and Management) to nanoscience and nanotechnology masters level education. He mentioned the possibility of creating a new benchmarking statement of nanoscience and nanotechnology education. DC added that due to departmental identities in physics, chemistry, materials and engineering, the interdisciplinary field of nanoscience and nanotechnology did not have an agreed definition between all the academic departments. LB provided an overview of all benchmarking statements for different subjects both the bachelors and masters level. She spoke about the two main elements of the benchmarking statements, in particular the subject definition and the standards associated with the statement. She added that it was important to bring other Institutes and stakeholders to define a benchmarking statement for the subject. She further mentioned that since there was no consensus on the subject definition it may be early to benchmark. PR spoke about the experience in Swansea with the engineering benchmarking statement. LB further added a new one could be added once the proposal is sent through to QAA, which would be evaluated by an independent panel of academics. The factors which would affect a new benchmarking statement would be size and number of programmes. It would be important to demonstrate dialogue with other bodies.

DC asked whether the existence of a department was a prerequisite for such a statement. LB responded by saying that input from the statement could be made from different subject benchmarks which would represent departments in their own right. Bringing together statement input from social science would be valuable too. She further spoke about the other aspects of the benchmark statement, which is defining standards in achievement of learning outcomes. She added that definitions at the Masters level would be the more challenging. VK spoke about the experience of the Cambridge programme. He added that both students and academics had encountered several problems as both groups are dispersed across disciplines and it is difficult to define the same yardstick to measure all. He added that there was a certain difficulty in branding for communication it as the programme was not considered a scientific programme but a programme for scientists. MS spoke about the research challenges for interdisciplinary programme. The types of different programmes, their design and delivery were discussed. LB added that universal definitions were difficult at a master's level, and stakeholders do not prefer a nationally agreed definition.

DC spoke about his experiences in being queried by students in India about the differences in definition of master's level programmes. He added that a lack of consensus was a problem for students. DC asked around the table on the feeling for a benchmarking statement. LB spoke about the review processes and involvement of professional bodies. A discussion on the

learning outcomes of students ensued. The acceptability of learning outcome by professional institutes' was also discussed. MS suggested that a new benchmark statement could be developed using the Venn diagram methodology relating them to modules in different course. LB added that it was acceptable to be creative in producing the benchmark statement. SD mentioned that as nanoscience and nanotechnology education develops and number of students increases, quality assurance issues would become important. At this stage, he added it is probably not adequate to have a new benchmarking statement.

4. EUR-ACE and UK-SPEC

KAS provided an overview of the EUR-ACE label that has been developed by European Network for Accreditation of Engineering Education. The national agencies accrediting academic programmes, he can use the label provided they satisfy the EUR-ACE framework. The label is in accordance with the European Higher Education Area Qualifications Framework and distinguishes the first and the second degree cycles. He added that 6 agencies including the ECUK were providing the labels. He mentioned that the EUR-ACE label provides recognition to Universities that have become compliant with the Bologna Process. A brief discussion on the EUR-ACE label took place and it was agreed that more information is circulated to the Education Sub-group.

KAS provided a brief overview of the UK-Standard for Professional Engineering Competence. He further added that the UK-SPEC under the Bologna process would be covered under the next agenda item.

Action Point 3.3 – IoN to provide more information on EUR-ACE

5. Impact of the Bologna Process

LB provided an overview of the Bologna Process and its implications. She spoke about the main features of the European Credits and Transfer System and their relationship with UK credit system. She also mentioned the self certification process that would be conducted by the Quality Assurance Agency for Bologna compliance. She also spoke briefly about the Qualifications Framework for the European Higher Education Framework. KAS added that the degree descriptors clearly differentiate between the bachelors and masters level degree. He further added that the integrated bachelors and masters programmes in science and engineering would be affected by the changes. In this respect he underlined UK-SPEC is likely to be affected. KAS added that in his discussions with ECUK it was mentioned that the dialogue on the changes is likely to go on beyond 2012.

A discussion on the MEng, MPhys and MChem honours degrees ensued. The applications and the gaps of the educational system were discussed with respect to degrees. Comparison and relationship of the MSc with respect to the MEng was also discussed. LB added that from the QAA perspective the learning outcomes from both degrees were considered at par. A discussion on the University perception of MEng degrees also took place. DC added that the discussion on the different aspect of masters' degrees within Bologna will be ongoing and will be revisited in the future.

6. European Masters Student awards

DC provided a background to the discussion in the light of the paper written by him on Science Engineering and Technology awards held in the UK. KAS updated the group on his discussions

with Malcolm Turner, the President of the World Leadership Forum on the SET awards for nanoscience and nanotechnology. The discipline categories, appropriateness of award, courses and sponsorship requirements were briefly mentioned. He added that for the current year, the proposal could not be submitted in time as sponsorship could not be finalised. The proposal would be revisited in the future. European Masters level awards were discussed thereafter. The European Materials Research Society was considered as a favourable venue. The timing of the awards in relation to completion of the masters' degrees was discussed. It was agreed that E-MRS in Strasbourg would be appropriate in June 2009. The mechanism for the awards was discussed. DC outlined that the supervisor would nominate the work of a student which would be reviewed by three judges. The finalists, their supervisor and family would be invited to E-MRS Strasbourg where the award would be presented.

Action Point 3.4 – IoN to explore the European Masters Student awards for June 2009 at the EMRS.

7. Code of Conduct for Responsible Nanoscience and Nanotechnologies Research

KAS spoke about the code of conduct published earlier in the year by the European Commission for responsible research. He outlined the scope of the voluntary code of conduct and the principles set out by the Commission, encouraging programmes to disseminate the information amongst fellow researchers and students. A discussion on the definition of nano, scope, depth of guidelines and review of the code took place.

8. International Collaborations

KAS provided an overview of the requests for international collaborations on education and training. SD spoke about the experience Cranfield University has with collaborators in Bangalore India. One of the main problems was on the marking of assessments of learning outcomes at the partnering Institution. He admitted Cranfield University made mistakes in early preparations and the fault was not that of the Indian partners. Solving the problem had become difficult for the 400 students in question and the QAA representative was being flown to India for resolving some of the outstanding issues, he mentioned further. The problems he added had its source in not enough work being done by Cranfield on the admissions and regulation front. He concluded that the lesson learned was to be upfront and that it was possible to work together with Indian academia.

DC mentioned about the prospective collaboration Surrey University is setting up in China. He further spoke about the Prime Ministers Initiative 2 under which funds were available for collaboration with countries such as India, Sri Lanka, Pakistan, Bangladesh, Singapore and other South Asia countries. He also mentioned that there was a special initiative called the UK-India Education and Research initiative which aimed at improving collaborations between UK-India academia collaboration. The US model for overseas education was discussed for its merits and demerits. MB spoke about training of teachers who could further propagate education, and quoted the example of training teachers from Hanoi. LB added that there was a Code of Practice by the Quality Assurance Agency could be used for used to address several issues. VK spoke about the Cambridge collaboration with M.I.T in developing the MPhil programmes. He added that the programme brought together many faculties in natural sciences, engineering and management. The programme was seen as a technical MBA and was a successful model that could be replicated at other Universities.

9. Counselling to Students

KAS spoke about a number of requests coming forth to IoN from students seeking guidance on educational and career issues. He provided an overview of types of request at the bachelors, masters, and doctoral level. A brief discussion on pastoral care issues took place. It was agreed that it would be acceptable to direct relevant enquires to course providers though in the first instance they would be directed to the website.

10. Nanoscience Communication

OS spoke about Harry Kroto's initiative on Global Educational Outreach of Science Engineering and Technology programme called Geoset.info. The approach involves downloadable Science Engineering and Technology material displayed with video recordings of the presenters. The outreach is considered a vehicle for science outreach and also promises to make the best teaching material available globally. It could be considered as a cross between YouTube and Wikipedia and the site can be accessed at www.geoset.info. Research work of students and other education material from Universities could be potentially projected through the website.

Action Point 3.5 – IoN to provide more information on GEOSET.

11. Any other Business

OS provided an overview of the European framework 7 projects that the IoN is involved in. She gave a brief description of the Observatory Nano project (<http://www.observatory-nano.org/>) that IoN is coordinating. The aim of the project would be to provide an analysis of peer reviewed publications on nanoscience and nanotechnology development relating them to economic impacts, social ethical and legal issues, regulatory and standardisation development. The output would be used by the European Commission to formulate technology policy for member states. A brief discussion on the output took place. The ICPCNanonet will be an open source repository of journal paper and publication in nanoscience and nanotechnologies across the world. It would also provide networking opportunities to researchers across EU and ICPC countries. A discussion on the publication and referencing to authors, and its implications and the merits and demerits of open source from the academic perspective took place.

IoN is also a partner in NanoCharM and SafeNano projects. NanoCharM focuses on characterisation of multifunctional materials exploiting ellipsometry and polarimetry. SafeNano is looking at regulation and standardisation in nanoscience and nanotechnology.

12. Date of the next meeting

This was proposed as 22nd October, in Cambridge