Training Tomorrow's Scientists

IS-07

REFLECTING ON AND RECORDING EVIDENCE OF ACQUIRED TRANSFERABLE SKILLS

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Studying off-campus, placements enable students to develop a range of skills that demonstrate their independence and adaptability, and enhance their academic and employability prospects (Messelink et al., 2015). The value of a placement experience is enhanced when the experience is systematically assessed (Beard, 2007). In the postgraduate module described here, the off-campus students write a weekly reflective log describing their personal and academic experiences and link them to key employability skills. On their return they write a final report describing the socio-economic drivers of the research and the potential impact of the research on local communities. E-portfolio system supports this online reflective log. The e-portfolio forms contain specific elements for students to complete, which are then read and evaluated on-line by supervisors who provide timely feedback and suggestions for improvement. This log also includes a skills audit, highlighting both the scientific and personal skills that have been developed during the placement. Monitoring students' ongoing performance is important in order to encourage formative feedback and dialogue between students and University academic supervisors, as well as encouraging students to take responsibility for their learning. Here we describe the evaluation of the student experience during these placements within an international university or national partner organisation, and the module assessment system. Data were collected using a questionnaire and a focus group, and several themes emerged from the analysis. First, results showed that taking part in the placement and conducting their own independent research at the host site helped students to make connections between their scientific knowledge, otherwise constrained within the walls of the University lab, and the wider impact of their research on society and people. Another theme was about career choices and aspirations, and the placement experience either confirmed prior choices or opened new horizons. Students were able to appreciate a wider range of research settings (e.g. research-support or mix of clinical & research), of which they were previously not aware. In relation to the assessments, students stated that the online reflective log helped them to feel supported by the university academic, while weekly feedback on work challenged them to reflect on the scientific and personal skills gained. Students agreed that they had further developed their employability skills (as determined by a skills audit) during the placement. Students acknowledged it was challenging to have to acquire evidence of skills development and to discuss the socio-economic impact of their work in the final report. However, they appreciated the usefulness of this reflection in relation to their future careers. In addition, many students commented that writing the weekly logs helped with writing the final report.

References: Beard, D.F. (2007) Assessment of Internship Experiences and Accounting Core Competencies. *Accounting Education*, 16:2, 207-220, DOI: 10.1080/09639280701234625

IS-08

EXTERNAL EXAMINERS, SUPERVISORS AND ACADEMICIANS FOR THE INTERNATIONAL POSTGRADUATE (MSc and PhD) PROGRAMMES

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Several International Universities are appointing External Examiners and International Academicians as Lecturers and Supervisors for their Post-graduate (MSc and PhD) programmes. The General Academic Regulations of the University of Zimbabwe, College of Health Sciences provide appointment of External Examiners "to moderate all formal examinations" for MSc programmes. The University normally appoints External Examiners for a three year cycle during which the External Examiner will moderate examination papers every year, but will visit the institution every other year to participate in the examination process. Appointment of External Examiners is made by the Senate on the recommendations of the Departmental Boards based on the high academic standing and CV.

The main duties of an external examiner are:

- to evaluate all forms of assessment which contribute to students' degree results;
- to evaluate, and help ensure fairness and consistency in the assessment process;
- to moderate summatively assessed work at module and programme level;
- to comment on draft examination papers and assessment tasks as appropriate;
- to report on the structure, content, academic standards and teaching of programmes;
- to comment on any alleged cases of assessment irregularities.

Each External Examiner is requested to provide a confidential written report at the end of his examining duties to the Vice Chancellor on email and not to the Chairpersons of Departments or anyone else. External Examiners are encouraged to make any comments they wish, including observations on teaching, course structure and course content, as well as the examinations themselves. Postgraduate PhD programmes at the University of Modena and Reggio Emilia provide advanced research and professional skills to highly qualified students. International academicians for the programs are appointed annually based on an evaluation for a high academic standing. Many of the programmes are jointly coordinated with national and international partners and all doctoral programmes offer the opportunity to spend time abroad for research and internships. Admission is based on an examination. All doctoral programmes at University of Modena and Reggio Emilia begin on November 1 and last three years, and no fewer than 50% of the students enrolled in the programmes receive full scholarships.

IS-09

GENDER ISSUES ON SCIENCE AND EDUCATION: THEORY AND PRACTICE

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Gender: refers to the social attributes and opportunities associated with being male and female and the relationships between women and men and girls and boys, as well as the relations between women and those between men. These attributes, opportunities and relationships are socially constructed and are learned through socialization processes. They are context/ time-specific and changeable. Source: UN Women, available at Concepts and Definitions

There are intrinsic biological differences which contribute to diversity of points of view. Diversifying problem solving styles, and widening perspectives on possible solutions is always positive. The participation of women in science and technology needs to be promoted since it has shown to contribute to increasing innovation, plus quality and competitiveness of scientific and industrial research. Furthermore, there is the need to advance and benefit from gender-sensitive research in innovation and development.

Education is the basis of all socio-economical progress. Towards the inclusion of a gender perspective in education can lead to advances in any society and gender gaps have to be avoided so as man and women have the same opportunities.

IS-10

E-MED ACTIVITIES IN CHARLES UNIVERSITY

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Medical faculties in the Czech Republic and Slovakia have developed a strategy for the construction of a network in 2006 and Chaler University was a leading institution. Instead of a new centrally organized consortium they created the network from the bottom up. MEDical FACulties Educational NETwork - MEFANET represents a strategy for preparing and sharing electronic educational materials.

MEFANET offers a common gateway to educational objects created by any member of the network. There are sophisticated tools for classification of the content, sharing it and controlling access. All activities of MEFANET are coordinated by an advisory board of faculty deputies. MEFANET has proven to be cheaper, more viable, self-regulating and

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self-assessing strategy compared to other approaches and centrally-organized institutions which is opened to 26 000 students. MEFANET cover three main platforms for collaboration and sharing educational objects. As the first, it offers a common gateway to e-publishing web portal. Sophisticated tools for classification of the content, sharing it and controlling access are implemented in the common gateway. The second one is a common installation of learning management system (LMS) Moodle. The third and most surprising one are WikiLectures – a tool for crowd sourcing of educational sources. MEFANET is community of people, not only a portal to depositories and it consists of more education tools than portal to learning sources. MEFANET is open for the medical schools of any other country. WikiLectures (WikiSkripta in Czech, www.wikiskripta.eu), are very opened ensuring maximally effortless contributing and fast updates. WikiLectures are not a dictionary as Wikipedia is; they are rather a textbook with well-defined target reader and specified learning objectives. WikiLectures contains more than 9600 "chapters" and this number is permanently growing. WikiLectures encountered over 40 000 visitors annually. English version is ready and freely opened. WikiSkripta is a vibrant academic community

IS-11

E-MED: AN E-LEARNING PLATFORM TO AUGMENT AND EVALUATE MEDICAL EDUCATION

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Electronic learning is an educational model in which computing, internet and related tools are used to augment and mediate teaching and learning. We have implemented e-learning in our curriculum not only as a tool for effective learning but also as an integral part of both execution and evaluation of the medical education program. We have built the platform (E-MED) on Blackboard, one of the most common learning managements systems, using almost all functions of the software including customized page design, learning modules, surveys, assignments and assessments. However, the real distinction of the E-MED platform arises from the use of the software's two less known functions: the analytics module and the goal alignment feature.

Analytics module enables close monitoring of student activities within Blackboard course pages as well as student grades obtained from various assessment pieces. We have implemented an advisorship program in which advisors have access to statistical reports of the students in real-time, making it possible to detect patterns of decline in an earlier point and intervene promptly. Advisors discussed these reports with the students in regular meetings and gave feedback in order to improve their performance. The second mentioned function, goal alignment, has been used to introduce all course outcomes of the medical education program to Blackboard. These outcomes then have been aligned to all electronic materials uploaded to the system including presentations, multimedia tools, book chapters, articles, assignments and test questions. Aligned assessment pieces are especially important because with the use of analytics tools we are able to produce reports detailing success of the students in an outcome-based manner. Therefore, for each outcome, we obtained a report containing student success rates which was used in course and program evaluation processes. In conclusion, we have constructed E-MED in order to fully use the advantages of electronic medium in augmenting and evaluating medical education by using outcome alignment and analytics. We believe that this model can be used for future initiatives seeking an analytical way of executing advisorship as well as course and program evaluation. This talk aims to explain key elements of the E-MED platform. Discussion session is preserved for live-demonstration of the system as well as a Q/A session.

IS-12

VIRTUAL LABORATORIES: A TOOL TO SUPPORT LEARNING

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Teaching laboratories often lack the resources to accommodate hands-on experimentation on many modern types of analyses and techniques.

This may be due to limitations in the accessibility to suitable samples, lack of equipment, or safety measures that would need to be implemented. There is hence a need for means to provide complete and up-to-date training for students even when real experimentation is not feasible. One solution to fill such a gap is the use of multimedia resources that display such experiments or techniques, another is to run computerised simulations of the experiments. This is useful but still does not provide the full experience; it is particularly desirable to have true spaces for experimenting, in the form of open-ended virtual laboratories, rather than watching animations or videos that always progress in the same way and end with the correct or expected result. Such an open exploration may be very significant for assimilation of the underlying scientific concepts, both methodological and analytical or diagnostical, and to gain relevant professional abilities like experimental design, observation and analysis of results. In this talk, these features will be highlighted while presenting some available resources. Particular attention will be devoted to demonstrate environments that allow users to design their own experiment and explore conditions, amounts, combinations with results that are not prefabricated, but depend on the actual conditions used.

IS-13

USING PROTEOPEDIA IN YOUR TEACHING OF BIOMOLECULAR STRUCTURE AND FUNCTION

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Molecular structure is an inherent part of nearly any lesson in biochemistry, necessary to understand both the properties of biomolecules and the interactions among them. There are, however, limitations in this understanding when the student is presented only with two-dimensional depictions of biomolecules, particularly so for bigger ones like proteins and nucleic acids. The use of three-dimensional molecular representations and the possibility of interactively exploring such molecular models are of great help in perceiving multiple issues of structure, interaction and, consequently, function. In this respect, the Proteopedia website offers ready-made materials, free to use, as well as a platform to develop new ones. This talk will provide an introduction to Proteopedia, its content and features, and several ways it can be used in the educational process. Particular attention will be put into how to make profit of Proteopedia, on the one hand to support teaching and on the other hand to entice students towards learning about the structure of biomolecules in an interactive, content-rich medium. In the associated small group session, attendees will have a chance to request more information and also to practice creating their own material in Proteopedia.

IS-14

EUROPEAN SCIENTIFIC POLICY IN LIFE SCIENCES SUGGESTIONS FOR THE FP9

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European Scientific policy was for the first time politically endorsed as a major driver for the future of the Europe at Lisbon summit meeting of Heads of State and Government of the European Union in March 2000. "The Lisbon Strategy" as it became known announced a bold agreement by all EU states to work "Towards making the EU the most competitive and dynamic knowledge based in the world, capable of sustained economic growth providing more jobs and achieving greater social cohesion" Progress in the basic science was then recognized as being as important as innovation.

As is obvious this decision stimulated the scientific community to collaborate in Science Policy issues in order to achieve the goals set up for the "European Research Area" (ERA) Recognizing the need for scientists to act collectively in order to contribute to shape the future of Science Policy in Europe, a Pioneering group of European scientists emphasized the need to join forces with other international organizations, to work forwards for the creation of European Research Council with the aim of supporting basic Research.