

## Making the difference in postgraduate education\*

Research in any field is carried out to solve existing problems, develop products and services, or to understand unknown mechanisms. In institutions, universities and private companies, research is carried out by scientists, faculty members, research scholars, and/or master's and undergraduate students. Qualifying in an examination, carrying out research and a thesis examination of the work lead to the award of a Ph D degree. Currently there is a worldwide shortage of Ph D degree holders.

The International Doctoral Education Research Network (IDERN) was established in April 2007 by researchers from around the world who work in the field of doctoral education. The main aim of IDERN is to broaden the field of research in doctoral education by providing an opportunity for researchers to share knowledge and perspectives in a trans-national online forum and to work towards a research collaboration in future. Capacity building to influence the shaping of future doctoral education policy and practice around the world is a domain of IDERN.

The second IDERN-2010 conference discussed various issues associated with supervision of postgraduate students, and the role of postgraduate students and their supervisors. Issues such as supervising doctoral candidates, generic and professional skills, training in doctoral supervision, assisting students with writing, helping students with the literature review, examining a thesis, writing examiner reports, and depth in a postgraduate thesis were discussed during the conference. About 400 postgraduate supervisors (scientists, faculty members and scholars) from Asia, Europe, North and South America, Australia, New Zealand and Africa participated in IDERN-2010.

T. Maxwell (University of New England, Australia) highlighted that the pedagogy of supervision is emerging as a key driver for the timely completion of

postgraduate student dissertations without compromising the quality. He also argued that both supervisors and postgraduate students should be clear about the research questions, methodology, quality of work and project schedule. In addition to the use of research matrix, communication between supervisors and students is essential to achieve common goals.

On the issue of supervising doctoral students to enhance their experience and career, M. Pearson (The Australian National University, Australia) argued that coaching the research project, mentoring the student and sponsoring student participation in the academic or research community are the key roles of postgraduate supervisors. To impart writing and communication skills in postgraduate students, seminars, journal clubs, laboratory meetings, writing groups and online student chat groups are useful.

A. E. Austin (Michigan State University, USA) argued that 'the next generation of faculty members and scholars must have a range of abilities, skills, knowledge and understanding that goes beyond what faculty members and scholars typically have needed to be successful'. She highlighted that students must develop a range of responsibilities such as conceptual understanding, knowledge and skill in the work areas, interpersonal skills and professional attitude. G. Hill (Queensland University of Technology, Australia) highlighted that there are limited or no professional development programmes to educate novice postgraduate supervisors.

A. Pare (McGill University, Canada) said that the supervisor-student relationship is delicate and both parties need to be cooperative. The quality of the PhDs depends on the quality of supervision and therefore supervisors should understand all aspects of a broader supervisory role. A. McCulloch (University of South Australia, Australia) argued that informal or formal mentorship programmes taught face-to-face, in groups or online, can be arranged to train supervisors properly.

G. Barbara (University of Auckland, New Zealand) argued that doctoral education is an engine for original knowledge production and a process for the formation and development of tomorrow's scientists, faculty members, re-

searchers, scholars and leaders. Though research is crucial for the advancement of knowledge and technologies, there are several examples of misconduct, including plagiarism. G. Hasanah (Universiti Putra Malaysia, Malaysia) gave a comprehensive talk on the integrity of scientists, faculty members and scholars. She argued that universities are facing the issue of scholarly integrity due to easy access to information, of copying written materials, and an inadequate system and mechanism to monitor originality of research data. The lack of knowledge among students about plagiarism is one of the issues and supervisors should train them in this aspect. L. Frick (Stellenbosch University, South Africa) highlighted that supervisors need to create an environment that motivates creativity and provides students the opportunity to showcase their creativity. Research is never complete until the findings are published to disseminate the information. S. Morris (University of Queensland, Australia) highlighted that research team members who contribute substantially to the research concept, design, analysis, interpretation of data, drafting of the article and revising it critically for intellectual content should author the publication. The current world record is 2512 authors for a single publication (*Phys. Rep.*, 2006, **427**, 257-454).

According to C. Tustin (University of Otago, New Zealand), Ph D is the epitome of an academic education. He highlighted that the Ph D examiner should ensure that a thesis is based on coherent investigation and has sufficient range and depth of study, original contributions to knowledge in the respective field, internationally recognized standards, thorough knowledge of the literature, and an appropriate methodology.

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