

ADAPTIVE KNOWLEDGE PRODUCTION

PROGRAM OF RESEARCH

BRIEF OUTLINE OF THE PROGRAM

It is apparent in recent Australian workforce projections and the House of Representatives report on *Building Australia's Research Capacity* (2008) that all sectors of education are to deliver the appropriate knowledge and skilled workforce needed for 21st century growth and stability. However, it is higher education that has to react most rapidly to develop the personnel and new knowledge to advance solutions to the highly complex, multi-faceted and increasingly global problems facing the nation. The demands generated by these problems particularly target 'top tier' activity in universities, i.e. effort concerned with the generation of knowledge and ingenious use of knowledge under dynamic conditions.

Adaptive Knowledge Production is an emerging construct that reflects a decade of our own research that brings into play the notion of 'deeply considered or measured uncertainty'. But to what extent do educational conditions and processes including their assessment and evaluation, build capacity to approach knowledge adaptively? This program **foregrounds the educational phenomenon of knowledge production**; its manifestations, the processes and conditions required for success, and very particularly the development of the individual learner. It is the educational role and response to the dynamic nature of knowledge building and generation and the capacity, generated through education, for innovation in using and building new knowledge which is of interest here.

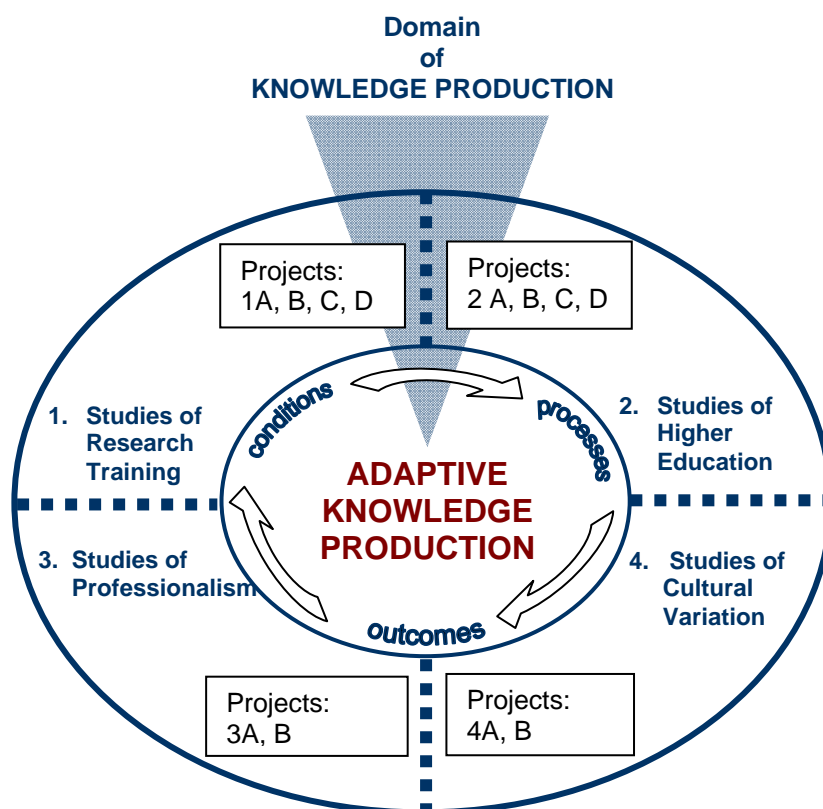
Creation and take-up of new knowledge is not static and requires ongoing **adaptation** at the individual, discipline and broader institutional and social levels. The importance of an adaptive approach can be found in the conception, execution and writing of a doctoral project; in the engagement with new disciplinary paradigms, and in dealing with new cultures of knowing and communicating. Inherent in the notion of adaptivity is a principle of uncertainty, in the form, the function and the flow of knowledge. This principle of uncertainty is reflected in terms of continuous innovation, and Harkin and Kubic's (2006) notion of the 'continuous innovation society', i.e. that with the influx of new knowledge, the certainties of what is known are in a constant state of questioning. Many professions are characterised as 'uncertain in nature', including teaching (Helsing, 2007). Successful reasoning to solve problems in such circumstances is underpinned by inherent flexibility with the knowledge at hand (Benner & Sutphen, 2007), and acquiring such understandings in turn suggests a way of being and belonging (Dall'Alba & Barnacle 2007). Hence, it is not surprising that 'identity' is regarded as an important focus for research into understanding knowledge production.

One of the aims of the program is to flesh out the construct and define the territory it inhabits. As the diagram below demonstrates, it will draw on studies in the overlapping areas of Research Training, Higher Education, Professionalism, and Cultural Variation in order to explore and systematically build knowledge about the nature, development and expression of AKP. There are currently eight projects underway across the four dimensions with a project leader in charge of each dimension and Allyson Holbrook overseeing the Program.

QUESTIONS DIRECTING PROJECTS AND ACTIVITIES

- How do individuals move from being knowledge users to being knowledge producers – taking the additional step to produce creative solutions, not atypically under pressure, within a framework of increasingly unpredictable rates and directions of change?
- When does the process begin? How does mindful adjustment to change occur and how it is played out?
- Is there significant cultural variation or discipline variation?
- How are achievements recognised and judged?
- Are there policy and practices will most effectively support the activity?

CONCEPTULISATION OF THE PROGRAM



EXPECTED SHORT AND LONG TERM OUTCOMES

- **Program Status:** Achieve PRC status and develop of a credible CRC application
- **Grants:** Submission of ARC and Alt-C applications
- **RHD Candidates:** Continue and expand the development of new researchers including PhD scholarships
- **Mentoring:** Grow the involvement of early and mid-career researchers, with an emphasis on mentoring, into CIs in national competitive projects
- **Publications:** Grow the numbers and proportions of our research publications in A* and A journals.
- **Collaboration:** Work more closely with colleagues in other faculties (currently both Science and Engineering) and institutions both nationally and internationally
- **Build for the future:** Develop new strengths and move more deeply into existing areas
- **Conferences:** Hold international conferences to showcase and critique contributions to the AKP program with high profile international invitees

PROJECTS IDENTIFIED FOR COMMENCEMENT IN 2010

Area 1. Studies in Research

Project 1A: Contribution of the viva in doctoral assessment

CIs: A. Holbrook, S. Bourke, T. Lovat, M. Kiley, B. Paltridge, G. Wisker & S. Starfield

This study will provide the first comparative analysis of examiner report text in systems that do, and do not, have an oral examination, and also to undertake a comparison of pre and post viva recommendations and emphases. It has already been established in relation to Australian reports that examiners offer considerable detail about their role and expectations in their reports, here we also explore what the viva adds to this body of knowledge and determine the differences, if any, in examiner discourse between different systems. We have the opportunity for the pilot project requiring funding here, to draw on some 40 de-identified viva portfolios from one UK institution. We will develop a coding system that reflects viva elements, and then trial comparison with existing corpora of Australian examination text across 4 discipline groups. In the subsequent ARC application we will compare institutions with a range of different Viva processes across several nations. The pilot brings together a new team that combines education and social linguistics.

Update: A successful ARC Discovery Grant (2011-13) *A cross-national study of the relative impact of an oral component on PhD examination quality, language and practice*, is currently underway. For more information visit the grant website.

Area 2. Studies in Higher Education

Project 2A: Tertiary education enabling Programs

CIs: K. Holmes, J. O'Connor, S. Bourke & A Holbrook

Australia is facing a serious shortfall in those undertaking tertiary studies in STEM (Science, Technology, Engineering and Mathematics) that needs to be addressed. Sustaining engagement in mathematics from an early age is a key factor in maintaining an option for later STEM studies. Funding in 2010 would enable this intended ARC LG (2011) to develop methods and instruments and obtain preliminary data for a project to design, implement and evaluate a novel mathematics intervention in primary schools that places specialist mathematics teachers alongside primary school teachers, with a series of visits from practising engineers providing a relevant context. This model creates a new method for improving students' conceptual understanding of mathematics leading to improved student attitudes to STEM. Recommendations will substantially improve primary teachers' mathematics teaching, creating a sustained impact for future years

Project 2C: Policy enactments in higher education

CIs: S. Crump

This project explores the policy enactments of educational reform, with a focus on higher education in Australia as well as internationally. The project draws on a body of research built up from the development of the 'policy cycle' work of the Thatcher era in the UK, through policies about school choice, middle class families, youth affairs, rural and remote e-learning and philanthropy and schooling. Conceptually, the project is based on notions of a policy 'footprint' that is recontextualised in local sites, yet also evidence of a shift from government to governance in public education and training, in which local actors gain more control, but government policies gain more traction and more faithful implementation. This hypothesis is highly relevant to the changes occurring in higher education in Australia and there is a need for well-referenced and soundly theorised research into the impact and outcomes of these reforms, with reference to commensurate reforms internationally.

Area 3. Studies in Professionalism

Project 3A: Professional decision making in obstetrics

CIs: R. Cantwell, B. Dunphy, S. Bourke + PhD candidate

Some preliminary work in this area has been completed, with a retrospective study of metacognitive factors and clinical decision making in obstetrics recently published in *Advances in Health Education*. Current work is examining the underlying metacognitive thinking of physicians. Funding in 2010 will allow for research assistance to enable the final part of this project to be undertaken: a prospective analysis of physician decision-making, and the potential Hawthorn Effect associated with the methodology.

OR

Project 3B. Cognitive factors involved in the identification and management of professional well-being amongst physicians and nurses

CIs: R. Cantwell, J. Scevak, B. Dunphy, K. Cholowski + PhD candidate

Whilst there is a significant amount of research highlighting the metacognitive nature of professional work, and a significant literature addressing challenges to well-being in professional work, there is no evidence of a research base addressing the metacognitive basis of effective management of the affective factors associated with challenges to professional well-being. We propose in this study to focus on issues relating to professional metacognition with particular emphasis on the identification of those strategies that may broadly be described as volitional – actions taken by individuals to protect professional goals, intentions and identities. This is a pilot study aimed, primarily through interview techniques, at identifying the nature of self-reported volitional behaviours to inform the development of appropriate instrumentation for a larger scale study of professional well-being to be submitted through national funding bodies.

Area 4. Studies in Cultural Variation

Project 4A: International PhD candidate understanding of assessment

CIs: S. Chen + PhD candidate

The large numbers of international research candidates studying in Australia provide at least two benefits to this country: a sum approaching \$10 billion per year, and knowledge production through their theses and research papers. As indicated by Tweed & Lehman (2002), in Australian universities the philosophic tradition is largely Socratic, but candidates from the East have a Confucian educational heritage (diligence, respect for authorities), while candidates from Islamic countries have yet another set of predispositions (Chen & Sit 2009). The aim here is to investigate two groups of research candidates, those with a Confucian cultural heritage and those with Islamic cultural background. Research questions relate to differences between the groups in perceptions of assessment in Australian universities and how they fulfil the tasks, and identifying a theoretical framework that can be established to improve the candidates' performance. This application will prepare the way for a Linkage project with international institutions as co-collaborators in 2012.

Project 4B: Provisions for Indigenous PhD Students

CIs: K. Butler

Increasing Indigenous participation is a national tertiary education priority. While the University of Newcastle evidences comparatively high access and completion rates, Indigenous students remain one of the most vulnerable cohorts with regard to attrition and extended candidature. Tertiary sector preconceptions generally attribute the difficulties experienced by Indigenous candidates to the institution failing to adequately accommodate the student's cultural difference or the student being unable to adapt to Western education norms. Significantly, there is little research testing these assumptions or identifying best practice models for engaging Indigenous RHD candidates. Using the concepts 'third space' and 'contact zone', this project will examine the University of Newcastle past and present Indigenous RHD cohort. This pilot project will complement the author's IRDS application on Indigenous doctoral knowledges (named mentor Holbrook) in 2010 which was a near miss in 2009. The researcher is also actively engaged in building an ALT-C application and seeking philanthropic funding for her planned work in Higher education Indigenous curriculum.

Update: A successful IRDS Grant, *Indigenous Research Higher Degree candidature in Australian universities: Exploring identity at the cultural interface*, (Chief Investigator A/Prof Kathleen Butler and Menor Prof Allyson Holbrook) is currently underway.