REVIEW OF AUSTRALIA'S RESEARCH TRAINING SYSTEM – CONSULTATION RESPONSE FORM

Please read the submission guidelines before completing and submitting this form. This form should be submitted through the consultation website. **Submissions should be evidence based, provide examples where possible, and address the consultation questions.**

YOUR DETAILS

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EXECUTIVE SUMMARY

Please provide an executive summary of no more than 300 words of your submission

The current research training system (RTS) seems to be working reasonably well, producing high quality and innovative researchers in the Arts, Social Sciences and Humanities (ASSH). One challenge that the sector faces is ensuring the appropriateness of Higher Degree by Research (HDR) scholarship, for those graduates not wishing to pursue an academic career, given the diversity of employment roles that ASSH researchers may pursue: e.g. in government, industry, NGOs, the arts and the public sector.

Working with industry and employers to produce graduates with transferable skills and "real-world" experience would ensure that Australia continues to produce programs and graduates that are internationally competitive. Assisting HDR candidates to better understand and articulate the transferable skills they have developed through their research – from project management through stakeholder negotiation and communication– will reduce barriers to rewarding employment that draws on the skill and expertise of graduates.

One means of aligning research training resources with the value of research skills in employment beyond the academy is to offer a small proportion of HDR scholarships that are aligned to collaborative industry projects/priorities, thus ensuring that a proportion of HDR scholarship is focussed and aligned to contemporary industry-specific challenges. For example, a small proportion of funding could be allocated to professional doctorates, which are typically more closely and directly aligned to industry challenges.

RESPONSES TO CONSULTATION QUESTIONS

PRODUCING HIGH QUALITY RESEARCHERS

Question 1 - What are the research skills and experiences needed to be an effective researcher?

The AQF Level 10 Learning Outcomes criteria nicely summarise the generic attributes that a PhD level researcher should have. In order to be an effective researcher a student needs to learn the norms and practices around research in their specific discipline, with their thesis making an original contribution to knowledge (see for example, Baker, Buckley, & Kett (2009) *Creative Arts PhD: Future Proofing the Creative Arts in Higher Education*, and Pachana et al. (2011) *Taking clinical psychology postgraduate training into the next decade: aligning competencies to the curriculum*). An effective researcher needs to understand how knowledge is constructed in their field, how to identify a research problem, develop a research question to investigate the problem, and be able to apply appropriate and rigorous research techniques to investigate the problem. Academics at the University of Adelaide, for example, have developed a conceptual Researcher Skill Development (RSD) Framework that captures how the development of research skills can be scaffolded to enable students to develop effective research skills. In this framework, students start by tackling highly structured problems that are set by instructors and then move through steps that enable them to increase their autonomy as researchers and eventually learn how to initiate their own research questions, design their own studies, analyse their own data, and communicate their findings to a range of audiences

The appropriate experiences needed by graduates will depend on the career pathway the student pursues. Nonetheless, the key required experience for all students is actually "doing" research, with researchers in the current system primarily engaging in an apprenticeship model to develop research skills in problem solving, project management, and answering novel questions. The specific development of these transferable skills would better enable our students to apply their knowledge and training to other areas of professional activity. To this end, DASSH recommends the development of appropriate formal coursework procedures that provide students with a robust and substantive background in research methodologies, both quantitative and qualitative, as well as project management and communication of research findings.

Whether students are planning an academic career or an industry career there should also be teaching experiences and teacher training embedded in their HDR program. People in every sector would benefit from this type of training and it would highlight the advantages of the HDR experience outside the HES. Likewise many more students should be offered internships or industry-engaged research experiences, which are embedded in their research program. This would benefit the flow of knowledge between industry and academia, and provide for better engagement. These could be student-initiated, where the student is asked to identify an appropriate industry partner and engage with them, or industry-initiated, where an industry partner seeks a student to work with them on a particular research problem. At Swinburne University, for example, industry engaged experiences have taken place in both ways, with both being effective for student outcomes.

Question 2 - What broader transferable qualities do HDR graduates need to develop to succeed in a wide range of career pathways? Should these skills be assessed, and if so, how?

Regardless of whether the specific field is chemistry, creative industries, social science or business, effective researchers make a significant contribution to knowledge in their discipline. To be successful, inside and outside of academia, HDR graduates need:

- advanced written and verbal communication skills, including the ability to communicate research findings to general audiences using accessible language
- advanced analytical research skills
- creative, independent and innovative thinking, including the ability to recognise opportunities to use their research skills for problems outside of the area of expertise
- self-directed, proactive and independent learners, with the desire to actively engage in ongoing professional development and lifelong learning; and
- leadership skills.

Within ASSH disciplines, there are differing views about the value of assessing these skills with the differing positions articulated below. Whether or not these skills are assessed the processes used to better develop and articulate these skills need to be carefully considered in relation to the diversity of research in the ASSH disciplines, recognising the value to employers and industry from having a workforce trained to use a range of different methods to address challenges, rather than assuming that a single approach to problem solving will be adequate for addressing all problems.

Arguments *against* assessing these skills: Students enter with a diverse range of skills and backgrounds; for example, in 2011 the average age at commencement of a research doctorate was 33, and in 2012 over 18% of domestic research doctoral candidates were over 50 (*Review of Australia's Research Training System – Discussion Paper*, p.1). These students bring a wealth of unique life experiences and interests, with their PhD appropriately focussed on developing their research capacity. Critically, doctoral degrees are nominally funded for 3-4 years with Master by Research degrees funded for 1-2 years, though some students take much longer to complete their degrees. This is despite the financial incentive to complete candidates in a timely manner. Any addition of formal coursework is likely to extend completion times. Indeed, most Australian universities are very "light-touch" in terms of compulsory HDR training, recognising and respecting the unique diversity of these autonomous learners (see Other Supporting Material).

Arguments *for* assessing these skills: Currently an HDR student's research skills are assessed through the examination of the PhD or Master's thesis. However the thesis tends to highlight very specific research skills, not the broader transferable skills that an HDR graduate might need to evidence in finding work outside of academia. It would be helpful for graduates if those broader skills were also assessed and their competency was demonstrable. The development of these broader skills and their assessment could be done through the addition of a formal coursework component to the higher degree research program.

One option could be a formal oral exam, which could take the form of a *viva*, at the end of a research training program which would promote the exchange of ideas and train students in advanced presentation skills. The viva is standard at the end of a PhD in much of Europe, India, the U.S., and in New Zealand, and Australia should consider adopting it. While many students now

engage in domestic and international conferences and present their work at such meetings, a formal requirement would enable students to gain important skills in this area, especially those whose training has been mainly on projects that are conducted individually rather than as part of a research team. The advancement of technology renders such an examination all the more feasible; the ACOLA discussion paper mentions that 50% of doctoral theses are examined by international examiners (*Review of Australia's Research Training System – Discussion Paper*, p.3), and a virtual meeting via Skype, for example, could easily supplement the current arrangement.

Question 3 - What other broader capabilities should HDR graduates develop during their research training?

As stated above, it would be valuable to increase the breadth of Australian research training by introducing coursework that trains research students beyond the objective of becoming an academic. What is vital for students to gain employment outside of academia is to be able to translate their research training into broader contexts and to identify their value proposition as researchers to their chosen industry. This involves advanced verbal and written communication and critical thought, both of which are easily achieved through networking with external organisations during their degrees and/or interning/conducting research with/for external organisations over the course of their study. However, this would require investment in industry engagement with universities from both the university and the business or public sector partner sides (see Other Supporting Material for more on industry experience).

CONTRIBUTING TO AUSTRALIA'S FUTURE PROSPERITY AND WELLBEING

Question 4 - What skills and capabilities do employers in Australia need from HDR graduates?

What is vital for Australian employers is that HDR graduates have the research skills and the ability to integrate theory and research, providing employers with fresh, innovative thinkers who are able to work in conjunction with industry.

While technical skills change over time, the critical thinking/research design/critical problem solving elements of HDR graduates' research training enable them to identify when and which new skills are needed and to learn new and innovative ways to solve their research problems. These skills assist graduates in challenging the status quo and developing innovative solutions, reshaping how business is done. However, because it is not the norm for Australian businesses to hire PhD graduates, some work needs to be done to encourage the practice by illustrating the skills and capabilities they can bring to the business. This could be achieved through more internships and engagement with industry, government and NGOs over the course of the HDR graduate's study.

Question 5 - What research skills and capabilities are needed to ensure Australia's research system remains internationally competitive?

Apart from those already outlined above, two key research skills and capabilities that are paramount are interdisciplinarity and making a contribution to the creation of new knowledge.

Interdisciplinarity
The important societal problems require a range of researchers from different perspectives working together. For example, you might think that you can solve water shortages through the purification of waste water, therefore an expensive water purifier is built. However, this technical solution will not work unless people are actually willing to drink purified waste water. In practice, Australians may think of purified waste water as sewage and be completely unwilling to consume it or even use it to water their plants, an issue that is well known to social scientists. So to solve the issue of water shortage, then, you need both the social and the technical research skills working together to enable a solution that both works reliably and is acceptable to potential consumers. The current narrow research training offered and the very short time frames for HDR projects discourages the inclusion of students on multidisciplinary projects.

Making a contribution to the creation of new knowledge
Equally important is enabling Australian academic and industry-based research to engage with and articulate with other local and international academic and industry-based research. At QUT, for example, ~37% of all HERDC research outputs produced in 2014 had a HDR author ('Minutes of the QUT Research Degrees Committee for 9 March 2015'). This illustrates the significant contribution HDR students are making to the national and international research community, and raises the possibility that perhaps the number of high quality HERDC publications and contributions produced by HDR students should become a national Key Performance Indicator.

HDR students need to engage on the global world stage to cement Australian HDR researchers as leading the global community. In order to do this, DASSH recognises the need for Australia to develop systems that provide for co-funded research grants with other nations and with international businesses in order to remain internationally competitive. For example, the European Commission's Horizon 2020 funding program precludes non-European partners from receiving direct support to their research but does encourage international collaboration provided the international partner funds a component. There is no Australian Government funding scheme that will readily provide this type of co-funding. It would also be worth investing in travel scholarships or post doctorate awards for international placements/exchanges providing HDR students with the opportunity to attend and present at conferences – along with opportunities to work alongside world-leading researchers.

Question 6 - What research skills and capabilities are needed from HDR graduates to ensure Australia is ready to meet current and future social, economic and environmental challenges?

As discussed earlier, a depth of knowledge in their disciplinary field, an ability to engage in interdisciplinary collaboration, and an appreciation and interest in the broader implications of their research for society, industry, and the community. Most HDR students display this wider engagement, but perhaps a small proportion of scholarships should be allocated for industry-specific challenges or the ARC grant themes.

RESEARCH TRAINING SYSTEM

Question 7 - What features of the research training system should be retained to ensure our graduates are internationally competitive?

On the whole, DASSH views the current research training system as working quite well and as such, a number of the current features should be retained. For example, the flexible entry pathways (with Honours 1, 25%-33% research components of a coursework master's program and Masters by Research dominating) are particularly effective. These should remain, as there is no evidence to suggest that different entry points produce higher quality contributions or theses.

The move from the apprenticeship model of supervision to a research training model is a good thing because it broadens the research student's understanding and skills. The three-year doctoral thesis (or equivalent) enables students to develop research design, implementation and communication skills and should be kept. It both offers better research training and protects students from the risks of having just one person providing all of their research training. However, this program is not sufficient to train HDR graduates for non-academic positions, and the extent to which this shift has taken place, though, is really variable across universities and across disciplines. It also does not easily articulate with international degree structures. In particular, it is difficult to provide structured training in theory and research methods and have a student to complete a substantial piece of research within a three-year time period. Providing formalised research training through a one to two-year master's plus three-year PhD postgraduate research training approach would also protect students and foster higher quality research training across the board. It could also increase mobility between universities should students desire such mobility.

The establishment and use of the Australian Qualifications Framework level 10 learning outcomes also work well and should be retained.

Question 8 - How should the research training system be structured to produce high quality researchers who can contribute to Australia's future prosperity and wellbeing?

DASSH considers there to be three important structural areas of the research training system that could be improved in order to produce higher quality researchers: linkages with industry over the course of a graduate's degree, interdisciplinary approaches to research, and a student's higher education pathway.

Linkages with industry over the course of a graduate's degree

In Australia, there is generally a disconnect between industry and HDR, in that industry does not recognise that an HDR student with ASSH qualifications or graduate can contribute to R&D or innovation. The HDR degree is almost viewed as devoid of value in an industry environment; PhDs seem to be the purpose of individual curiosity and personal growth, with the exception of academic careers. This is not so in other countries, such as Germany, for example. So, the first step needed is a cultural change in the industry sector - only in this way we can think of creative and innovative futures for all types of industry in Australia. To do this, ASSH graduates need to develop better skills in articulating the value of their research and research training to potential employers in industry and the public and NGO sectors.

To change this culture, we need to prove the worth of research and prioritise the development of HDR-industry connections. A proportion of government funded scholarships could be allocated for industry-collaborations or specific challenges, and perhaps developing professional doctorate or post-doctoral scholarships that are funded specifically for industry challenges (i.e., an ARC Linkage/DECRA-style scheme to fund PhD graduates to work with industry). This would help ensure some HDR scholarship is focussed and aligned to contemporary industry-specific challenges. Candidates would come from professional/industry background and thus have the potential to strengthen the relationship with industry. Their goal is to innovate in their field of expertise, and re-position themselves within their profession.

As example of how support for professional doctorates could more readily develop links with industry, researchers studying the Doctorate of Creative Industries (DCI) at QUT are focussed on designing, implementing and evaluating professional practice research projects – with this analysis and reflection on professional practice having a tangible impact in industry. Allocating specific scholarship funding towards the more professionally orientated doctorates is a straight-forward and impactful way to enhance the industry relevance of research.

Interdisciplinary approach to research

To date, the Australian research training system has had a very individualistic approach to study and supervision. Traditionally a student is supervised by one main supervisor and in one main academic unit. With the growing understanding and support for the need of interdisciplinary approaches to investigate complex global issues, it may be time to move this approach for research training as well.

There are a number of issues that need to be addressed for this to occur. For example, the involvement of academic units in supervision is often problematic due to financial constraints; within many universities, numbers of students are counted by department and "sharing" students presents difficulties. In a climate of increased accountability, such arrangements have grown more rigid. It would be advantageous to students, supervisors, universities and communities, however, to develop processes that facilitate interdisciplinary work at the university level and national funding schemes that support it. Such changes carry the potential to encourage a sense of collaborative research training in students that allows the skills developed through their HDR thesis to be extended to future projects.

A student's higher education pathway

In regard to the pathways a student takes through their higher education career**,** a better structure for this would mirror the Bologna model: a three to four-year undergraduate degree followed by a

one to two-year master's degree followed by a three year PhD degree. This 3+2+3 model would enable the development of broad-based research skills during the master's degree years and would ensure that all students entering the PhD are well-trained. At the moment the type of research training provided in honours degrees and the master's degrees varies greatly with some students entering the PhD adequately trained for their specific project and others with very little research training experience. The latter students typically take longer than three years to complete their projects. Few have the broad skills that would easily translate into industry positions. There is little structured training in many traditional PhD programs, and even less attention is currently given to developing skills in research communication and applying research skills to non-academic contexts.

A 3+2+3 model would also be familiar to international students and articulate with many of their expectations around the structuring of postgraduate research. Our general lack of the master's component makes it difficult for Australian universities to partner with many international universities as the PhD degrees are not seen to be equivalent and international universities do not want their students to have less training, this reduces the opportunities for Australian postgraduate research students to participate in international exchange to broaden their experience.

A good number of PhD programs across Australia are now requiring students to undertake some formal research training. However, the research training provided is very much dependent on the University and the research program. The social and political science PhD programs at Monash, for example, require students to undertake 120 hours of professional development prior to their confirmation. The Faculty of Arts PhD at the University of Melbourne requires "25 credit points, made up of a two-part workshop (12.5 points) and two electives (6.25 points each)" in the first year of candidature. Business PhD students at QUT are required to undertake research methods training unless they graduated from the QUT honours program in which case the requirement is waived. All PhD candidates at the University of Tasmania undertake two core units (2 x 12.5%) in the Graduate Certificate of Research. Some universities have no coursework requirements. So the required coursework varies across the sector and the level of training students receive is uneven.

It would be better if all Australian HDR graduates received theory and methods training, appropriate for their discipline, as part of their degree. If offered through a master's level qualification, formal research training would be able to be rigorously developed and delivered.

The 3+2+3 model could also offer an applied research degree at the master's level for people interested in advanced research training but not in doing a PhD level project. The one to two-year master's degree would replace the honours year (see Other Supporting Material for concerns with this model in regard to funding).

Question 9 - How can entry and exit pathways to and from research training be better structured?

While DASSH believes that the current system works well, it may be beneficial for students to undertake a research focused master's degree with a strong coursework component and then articulate into a PhD. The North American model allows for a post bachelor's PhD with the need for coursework and other hurdles (e.g., qualifying exams, oral defence of the proposal) to be successfully completed at a high standard prior to moving to the dissertation component. Students

can exit with a master's degree if they choose. In this integrated PhD model students can also choose to do a master's degree and later undertake a PhD.

The Bologna model is essentially a 3+2+3 model. By the time the students finish their master's degree they should be aware of the requirements of the PhD. Ideally this model would discourage students unsure about their projects from enrolling and also reduce the amount of time needed to complete the thesis.

DASSH is concerned with the potential for entry and exit pathways surrounding gender and diversity marginalisation. We believe that universities should aim to encourage more participation in research by groups who have been traditionally marginalised. Success in this area would require universities to invest in the development of supportive infrastructure. This would involve more formalised training, including more coursework options and research training. It would necessitate funding and planning, yet has the potential to change the landscape of our research capabilities.

Another related area that was not directly raised in the ACOLA discussion paper concerns research students who withdraw from their research programs. The Postgraduate Research Experience Survey gives valuable information regarding perceptions of our programs by students themselves and it is gratifying to see an 87% satisfaction rate. This survey is, however, carried out among students who complete their research degrees. We currently lack information about the experiences that shape students' decisions to withdraw from HDR study. One of the keys to improving our programs and fostering greater benefits for students, universities and external agencies may lie in these students' perceptions of their research training. DASSH recommends greater research into this cohort of research students.

Question 10 - How can barriers to participation in HDR programs be overcome so that more candidates from non-traditional backgrounds, including indigenous students, undertake research training?

Universities need incentives to identify promising undergraduate students from non-traditional backgrounds and encourage them to undertake research training. Scholarships targeting these groups should be developed for all levels of research training, with potentially a bonus completion amount allocated for universities that graduate non-traditional HDR candidates. Universities need incentives to encourage participation.

As outlined in response to Question 9 above, the development of infrastructure to train these students to produce the best results is key. Similarly, research into why candidates from non-traditional backgrounds withdrew from research programs could provide insights to what is currently lacking in support for these students.

OTHER SUPPORTING INFORMATION

Further supporting information not covered in your answers to the consultation questions should be provided here

"Light-Touch" approach from Australian universities
It is important to acknowledge that the Australian approach to HDR coursework varies, with universities navigating the challenge of learning and knowledge duplication for autonomous learners at this level in very different ways. Many universities are very "light-touch" in terms of compulsory training. At Swinburne, for example, a research methodology unit is compulsory only for students without an honours or masters degree. This "light touch" approach acknowledges that students commence their PhDs at different levels in their careers, with varying discipline and professional knowledge: it argues that no one compulsory unit can cater for these differing skill sets, viewing "non-formally enrolled" seminars and masterclasses as more appropriate when the average age of a commencing doctoral candidate in Australia is ~33 years.

Several Australian universities have 1-2 compulsory research methods classes, providing a more generic introduction and overview (e.g., RMIT, QUT, Griffith). A minority (e.g., CQU) have very structured research training, with CQU requiring students to develop a HDR Skills Audit and Plan within their first two months that includes 48 hours (six days) of elective professional development activities (selected either from their Research Skills Program or externally, as guided by supervisors and topic*).* There are no formal compulsory units, but CQU's Research Skills Program has 11 compulsory "components" (e.g., Research Integrity; Introduction to Professional Writing and Editing; Overview of Workplace Safety Arrangements) and numerous elective "components" that cover specific research project design, method and analysis approaches (e.g. Introduction to Research Design & Statistics (SPSS); Advanced Statistics (SPSS); Grounded Theory; Basic Mapping & GIS Skills). Notably, several universities clearly identify opportunities for students to independently develop specific research skill-based training, for instance noting and linking to existing units in qualitative and quantitative techniques.

The important point to note is that most universities are very "light-touch" in terms of compulsory HDR training, recognising and respecting the unique diversity of these autonomous learners.

Industry experience
A key challenge for integrating industry experience into higher degrees research is the sometimes different level of rigour and the short timelines needed for industry-based research. AMSI Intern provides a model for how this might work. Their industry-focused internships are best suited to students towards the end of their HDR degree, and they have already completed their own research. At this point the students are industry ready. From a humanities and social sciences perspective, internships in non-profits, government and private research firms would be the types of placements that would need to be developed. A downside of the AMSI Intern arrangement is that the relationship is between the AMSI Intern and the industry partner, not really the University and industry partner, so the internships may or may not foster closer relationships between universities and industries.

Enabling students to suspend their enrolment while undertaking an industry placement would encourage students to sign up. An issue around this is the visas of international students, which

require them to be enrolled full-time in order to study in Australia. For this to be successful for both domestic and international students, we would need to allow international students to participate on the student visa while being on a leave of absence from their study during the internships.

Funding concerns for the Bologna model

For the "two-year master's plus three-year PhD model" to be successful, funding arrangements would need to be organised so that students could afford the extra year. Research has shown that most students take four years at least to do their PhD, so it is really one extra year, the coursework year, that will need to be funded. Several universities now have a master's of research with a variety of funding arrangements, so there are models that currently exist which could provide the foundation for change (e.g., Curtin University, Macquarie University, University of Western Sydney).