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Silva, Pujitha, Woodman, Karen, Taji, Acram, Traveyan, James, Samani, Shamim, Sharda, Hema, Narayanaswamy, Ramesh, Lucey, Tony, Sahama, Tony, & Yarlagadda, Prasad K.

(2016)

Support services for higher degree research students: A survey of three Australian universities.

European Journal of Engineering Education, 41(5), pp. 469-481.

This file was downloaded from: <https://eprints.qut.edu.au/89745/>

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<https://doi.org/10.1080/03043797.2015.1095160>

Support Services for Higher Degree Research Students: a survey of three Australian universities

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Abstract

A survey was conducted across three Australian universities to identify the types and format of support services available for higher degree research (HDR) students in Engineering and Information Technology (IT). This study was part of a larger study of factors influencing the success of international graduate students in Engineering and IT. The services were classified with regards to availability, location and accessibility. A comparative tool was developed to help institutions categorise their services in terms of academic, administrative, social and settlement, language and miscellaneous (other) supports. All three universities showed similarities in the type of academic support services offered, while differing in social and settlement and language support services in terms of the location and the level of accessibility of these services. The study also examined the specific support services available for culturally and linguistically diverse (CALD) students in Engineering and IT. The three universities differed in their emphases in addressing CALD student needs, with their allocation of resources reflecting these differences. The organisation of these services within the universities was further examined to identify possible factors that may influence the effective delivery of these services, by considering HDR and CALD student specific issues. The findings and tools developed by this study may be useful to HDR supervisors and university administrators in the fields of Engineering and IT worldwide in identifying key support services to better improve outcomes for the HDR students and their universities, including programs in the European Union where academic mobility

Keywords: Australian Higher Education; International Higher Degree Research Students; Support Services; Culturally and Linguistically Diverse

1. Introduction

Higher research degree students, (PhD, Professional Doctorates or Masters by Research) contribute significantly through their knowledge, skills and talents. They provide human capital, knowledge and innovation which is key to the development and growth of modern economies (Edwards, Radloff, and Coates 2009). HDR graduates in Engineering and IT contribute to Australia's skills base as well as helping to expand and maintain high knowledge and research profiles. Studies have shown that HDR students contribute to two thirds of the research at universities and international evidence shows that up to three quarters of private sector patents draw on public research (AG2011). Increasingly large numbers of international students are pursuing higher degree research qualifications in the universities across Australia (Larkins 2011), as it also true in the countries of the European Union. The majority of the international students who come to Australia are from China, India, Republic of Korea, Malaysia, Vietnam, Thailand, Indonesia, Nepal, Brazil, Saudi Arabia and other countries (AEI 2012b). Data shows that 12 per cent of international HDR graduates remain in Australia after the completion of their degrees (Edwards et al. 2009). The students who return to their home countries also bring the benefits of their education.

In general, international students contribute positively to the Australian economy through fees and utilization of goods and services for onshore students and other offshore educational services. Of these, 66.5% of the onshore income was from the higher education sector (AEI 2012a). The international HDR students also contribute to the global workforce, and are a resource for developing and maintaining a diverse, modern and globalised Australian economy. They contribute through knowledge, skills, talent and opportunities for collaborative research, as well as economic and social links that can potentially help Australia sustain a high quality of human capital help and maintain competitiveness in the global market (AG 2011; DIAC 2011). HDR students in Engineering and IT also make an important

contribution to innovation. In line with Australia's innovation goals, and in order to increase businesses investing in research and development, Australia needs people with research and technical skills (AG 2011). Studies conducted in the United States show that the movement of international students is closely related to domestic innovation evidenced by numbers of patents, scientific publications, citations and science and engineering output for local universities (Chellaraj, Maskus, and Mattoo 2004). Similar findings are true of outputs in the E.U. There is, therefore, a global need to maintain and encourage international HDR enrolments (AG2011), and to provide appropriate support to these students towards successful completion of their studies.

The impact of language and culture on the integration and academic performance of CALD students in Australia have been investigated for well over two decades. The effects of language and culture on assimilation and integration (Omeri et al. 2003), their learning styles compared with Australian students (Ramburuth 2001), perceptions and misconceptions about international students (Chalmers and Volet 1997), and more recently, the effects of the cultures of international students on local students (Foster 2012), are well documented. These studies indicate that the differences are often more at an individual student level, rather than broadly reflective of culture, although culture and language may play an important role in influencing the expectations some students have upon arrival in Australia.

Australian universities have responded to the increase of international students by putting in place a range of supervisory frameworks and support services to help students settle into an often significantly different research culture. Efforts to improve research training performance have typically emphasized the importance of timely, quality research degree completions. Examples of such Australian programs include the 'Research Training Scheme' (RTS), the University of Technology Sydney's 'first Consortium', Queensland University of Technology's (QUT) 'Introduction to Research for International Students' (IRIS), and University of Western Australia's (UWA) 'Facilitating International Research Students Transition' (FIRST) Program. While most universities appear to offer some resources for improving the support to international students and their supervisors, funding limitations and development costs may influence these programs. Therefore, a targeted approach to where support would be better directed and more cost-effective may be needed. This study attempts to provide a benchmark of categories of supports against which other universities can assess their own offerings.

This investigation is part of a larger study (Yarlagadda et al. 2013) aimed at identifying factors influencing the academic success of CALD and international HDR students in Engineering and Information Technology disciplines. The present study was undertaken to investigate the support services available to international HDR students at three Australian universities, namely Queensland University of Technology (QUT), University of Western Australia (UWA) and Curtin University of Technology (Curtin), which all had HDR courses in Engineering and IT, but were different in terms of institutional size, background, student populations, etc. (see Yarlagadda et al. 2013). The support services were examined in terms of their availability, accessibility and organisation within the universities. This paper presents a snapshot of the support services available at these universities for HDR students, including CALD and international HDR students, provides a tool for similar comparisons for other institutions, and suggests specific support services which may be critical for the overall success of the CALD and international HDR students, in light of the findings of the larger study (Yarlagadda et al. 2013).

2. Method

Interviews were carried out with key academics and support staff involved in HDR supervision and/or administration roles related to HDR supervision, within the three universities. Data was collected based on responses to a checklist developed for the project of HDR support services offered at QUT, UWA and Curtin universities. The focus of the checklist was to identify support services that were available to CALD and international HDR students at each university, and to compare these services across the three institutions. Some services were not exclusively HDR or CALD related, but may have served to enhance their academic success. Services were analyzed with regards to the availability, location and accessibility in each institution, and then compared across the three universities.

For example, a service was considered available if it was offered directly by the university, or indirectly through a university affiliated agency, such as a student club. Services were categorised with regards to their location, by considering where they were housed, whether at the University, Faculty or School/Department levels, or located separately. Accessibility of support services was assessed based on which groups had access (e.g., supervisors, all HDR students, all international students, etc.), where the access was (e.g., online, on-campus, in a special location, etc), and how easily accessible they were.

A comparative table was developed to categorise support services into the following five general categories: academic support services; administrative support services; social and settlement support services; language support services; and other support services.

3. Results

In this section, first, a description of the categories of support services identified will be presented. Second, an analysis of the type of access for these services across the three institutions will be discussed.

3.1. *Academic Support Services*

‘Academic support services’ included research support, technical writing skills, computer support, milestone preparation support, language support, and research commercialisation support. These support services were defined as essential services that were directly related to students’ academic activities (Table 1).

3.1.1. *Research support*

All three universities had dedicated offices to cater to supporting and developing research students. For example, there was the Research Students Centre (RSC) at QUT, the Office of Teaching and Learning (OTL) at Curtin, and the Graduate Research Students office (GRS) at UWA. In addition, the libraries played an important role in all universities in supporting student research activities, by offering specialised courses on research and research related skills (e.g., Advanced Information Research Skills at QUT). For example, at QUT, these courses included referencing tools such as Endnote and specific academic databases, and specialised liaison librarians were available at faculty level. Support at Faculty level was typically discipline-based where research centres existed, such as at the Institute for Health and Biomedical Innovation (IHBI) at QUT, where there was a dedicated focus through themed workshops for students, conducted at the faculty/research centre level. These

dedicated workshops varied from optional to mandatory. Overall, there appeared to be few mandatory courses that students had to take as part of their higher degree research studies, with the exception of one subject offered to HDR students in Information Technology.

3.1.2. *Technical Writing*

Technical writing skills support was available in a number of ways at the three institutions: dedicated workshops on technical writing for HDR students (QUT, UWA); workshops for international students (International Student Services, ISS-QUT); and language support that covered technical writing (Curtin). The frequency varied from weekly 'writing circles' (QUT) to less frequent, but specialised writing retreats and scientific workshops that include publishing skills (UWA).

3.1.3. *Language Support*

Language support services included English language support through writing skills development, and other initiatives. English language support was offered in a number of different ways: through a dedicated service to developing English language competency (ELC-Curtin, CELT-UWA); indirectly through writing skills workshops at faculty level and funding to help in thesis writing (QUT); and/or on a need basis through special funding available for supervisors (UWA).

3.1.4. *High Performance Computer (HPC) Support*

All three universities provided HPC support which was generally available at the university level, while specialised help was also available at the school or department levels. This included specialised software support for use of statistics in Engineering complemented by consultation sessions in statistics (UWA). In addition, Information Technology services offered a range of technical support on general computer issues at an overall university level (QUT).

3.1.5. *Milestone Preparation*

'Milestones' are critical points in candidacy and progression in HDR courses in many Australian universities. How the three universities addressed and administered milestones varied significantly. For example, milestones were monitored via a formalised process at QUT, involving specific requirements for achieving milestones. For example, at QUT, the process included a comprehensive research proposal and plan within 3 months of candidature (with a formal confirmation of candidature typically before the end of the first year of candidature); annual progress reports; and a final seminar (three months before the end of the third year of candidature). These milestones were monitored centrally in the university. By contrast, at both Curtin and UWA, progression remained an informal process, facilitated and monitored largely within the School or Department, by the supervisor in conjunction with the HDR student. Support for milestone preparation was done at regular specific research group forums, where attendance at research seminars was emphasised as important and compulsory in some cases. Peer support was encouraged, whereby more experienced senior students were expected to help the newer students, for example at UWA, and the Buddy Scheme in some Schools at QUT, although there was no formal process in place. It is unclear why these differences exist, or whether there was any impact on outcomes, although institutional history and culture may play a part. Further research is necessary to address these questions.

3.1.6. Commercialisation of Research

All three universities had a dedicated arm for commercialisation of research and findings. Commercialisation support is of particular importance in the areas of Engineering and IT, given the potential for patent and IP issues related to research outcomes.

3.2. Administrative Support

‘Administrative support’ included guidance, information and skills support. Administrative support was available to both students and supervisors at different levels at all three universities (Table 2).

3.2.1. Information and Training Support

This type of support included inductions, online support and specialised support through publications like the Science and Engineering Faculty’s (SEF) survival guide at QUT. Access to facilities like laboratories was granted upon gaining necessary safety training which was offered to small groups quarterly. Web based forums like My Research Space (UWA) were also available to aid the individuals in their academic research and connect them to other researchers.

3.2.2. Administrative skills support

‘Administrative and supervision skills development support’ is available to help supervisors manage their supervisory work load at all three universities to varying degrees. For example, administrative skills support was available in terms of specialised supervisor training (e.g. QIPS at QUT) as well as at Faculty level at QUT. Similarly, it was available at Faculty level as well as general help offered at Curtin via Office of Research Development (ORD) and at UWA through the Graduate Research School (GRS). Supervisor support was mainly offered at university level through professional development workshops (e.g. QIPS at QUT), with the exception of specialised skills training or library services which were offered at Faculty or School level.

3.3. Social and Settlement Support

‘Social and Settlement’ support services included services related to accommodation, spousal support, cultural and social support, and counselling (Table 3).

3.3.1. Accommodation Support

The type of support in finding accommodation varied considerably between universities, with Curtin having available on-campus housing for graduate students, whereas UWA and QUT students typically had to find off-campus housing (also see Cultural and Social Support – below). All three universities provided online accommodation support through the university via dedicated websites for international students (ISS webpage-QUT) or general HDR (GRS-UWA), or more informally through student clubs (CUPSA-Curtin).

3.3.2. Spousal Support

No dedicated service within the university was available at Curtin and UWA for spousal support, while QUT provides some organised activities which are initiated by ISS for spouses of international HDR students. However, Curtin does offer a number of services, including onsite housing and childcare, which may also be considered as supportive of spouses.

3.3.3. *Pastoral Care*

Pastoral care includes general life issues that may or may not arise from academic research. The degree of pastoral care varied between the universities. It was available at the supervisor level (principal or associate); School level via postgraduate coordinators and HDR directors (Curtin, QUT); and at Faculty level via post graduate coordinators (Curtin). For example, the director for International Graduate Research (IGR) existed as a specialised role created within QUT to offer assistance to international HDR students across the university. Pastoral care includes issues pertaining to social factors or those presented by cultural differences as well as financial, family and supervisory problems.

3.3.4. *Cultural and Social Support*

The level of cultural and social support available for CALD students differed in nature and scope between the three institutions. These differences may reflect the needs of the specific demographics of their current cohorts of CALD students, or the history and location of the universities. For instance, Curtin University, which currently attracts many students from the Middle East, offered health and recreation facilities, onsite child care facilities and a prayer hall/mosque catering to all students including HDR students from an Islamic background and their families. By contrast, at UWA, social support was provided to international students by giving them incentives to tutor in residential colleges in exchange for free accommodation. At QUT, the social support typically included activities organised by QUT Research Students Network (QRSnet) at university level and other social gatherings organised at the Faculty or Research Centre levels.

3.3.5. *Counseling*

Counseling services were provided at all three universities, and typically offered at the university level. In addition to this, QUT offered special workshops on stress management, time management and other wellness programs for HDR students through QRSnet.

3.4. *Other Support Services*

‘Other support services’ included support services available to supervisors such as training programs (Table 3). These kinds of support services were offered formally at QUT, and included specialised workshops offered on supervisory solutions, as well as online through e-Grad and SEF info HUB at Faculty level. There were no formal services identified in these areas at UWA or Curtin, but help was available by contacting respective postgraduate research offices. Curtin and QUT which are members of ATN universities offered this service through e-Grad School, a virtual school operating locally and internationally. It provides HDR students and early career researchers with skills and knowledge in career development. This service was not available at UWA, which is not part of the ATN.

3.5. *Service Delivery and Organisation*

Having identified the key categories of support services available to international, CALD and/or all HDR students, the support services were then analysed from the perspective of accessibility of a service. Having services about which students and staff are not aware is obviously not the most efficient use of resources. From a service delivery point of view, four classifiers were identified in the organisation of these services. These categories included: formal versus informal; centralised versus distributed; general versus specialised; and current needs versus anticipated needs. The results of this analysis are illustrated in Table 4.

4. Discussion

This study has identified and explored a number of issues in support services to international, CALD and general HDR students across three Australian universities. This study provides a snapshot of the state of support services at three universities which vary in terms of size, student populations, academic and research culture, and history. It also provides a tool against which other institutions worldwide can benchmark their own student support systems for Engineering and IT students, both CALD and in general.

The main finding of this study is that all three universities provided very similar support systems and resources for international, CALD and general HDR students, albeit in occasionally different ways. The amount of similarity suggests an implicit consensus on the types of support services necessary for these kinds of students and programs. The differences in provision of services may reflect institutional and/or philosophical differences in the best way to deliver them, although further research is necessary. An interesting area of difference was in the formal/informal dimension of supervision and progression. While QUT has formalized processes of progression, UWA and Curtin both use more traditional local administration of milestones, etc. Similarly, where Curtin provides more centralized support services in terms of on-campus accommodation, childcare, etc., both UWA and QUT do not.

It is difficult to assess the degree to which these differences influence student progression, success or perceptions of their lives as HDR students. However, our larger study revealed that the students were generally satisfied with the support given by the supervisor in the academic research related activities, but results suggested the need for a greater level of support in general life issues, such as those involving social, financial and/or cultural issues amongst some types of graduate student (Yarlagadda et al. 2013). This study indicates that supports for many of these issues do exist on campuses, but it is unclear whether all of the students or supervisors are aware of the services, or how to access them. In the larger study, supervisors, in general, were positive about their international and CALD Engineering and IT students, but may have seen pastoral care issues as outside of their supervisory job, for cultural reasons. Similarly, some identified the need for better language and communication skills for some CALD students, and some domestic students: *'In general international HDR students require more supervision time due to language problems. Universities need to recognise and support both HDR students and Supervisors'* (Yarlagadda et al. 2013), but they may not have realised that these types of supports existed on their campuses, or not been aware of how their students could access them.

\This was perhaps due to the time taken for such skills to be developed which was seen as delaying the progress of the thesis or that they did not see the usefulness of these courses as indicated by the following supervisor comment: *'Time (sic) required to focus on language and communication skills, particularly in thesis writing and developing a logical argument. Students' ability to develop logical argument is not good and university courses do not seem to be helpful.'* (Yarlagadda et al. 2013). This underscores the need for better communication between the supervisor and the support services so that the utilisation of these services are maximised for the benefit of the students who need them.

In light of the increasing student populations from diverse cultural backgrounds around the world, it is important to improve and expand these kinds of services by considering the social and cultural contexts of the different cultural backgrounds of students. It is equally important to consider the extent to which university support service providers need to be informed of these findings in order to better market and offer such services. To do this kind of dissemination, however, suggests that all services, including those informally provided (through agents or clubs or outside the university campus), should be identified, in order to increase awareness of their existence. Specialised services may be useful for helping HDR students address their specific needs, which may be different from undergraduates. This can ensure effective delivery of services to more specialised students. To achieve and maintain effectiveness, supports such as career services should be constantly reviewed to promote their effectiveness in light of changes in the job market. Similarly, the effectiveness of a given support service at the service level may depend on its degree of utilisation. In this regard, the delivery of the service and the internal organisation of the services need to be aware of the cultural and language effects on utilisation of these services.

Since currently, the majority of international students appear to come to Australia from Asian countries, an understanding of the cultural and educational contexts from their home countries may be useful in the development of awareness programs for supervisors and administrative staff. For example, students may come from hierarchical educational systems, where a 'good student' does not question the teacher/supervisor, nor initiate work. These role expectations can be problematic in the Australian educational context where research students are expected to show a high level of personal initiative and autonomy, and where therefore supervisors may assume students are aware of support services, which in reality they are not. Observations made by supervisors of CALD and international HDR students note these behaviours (Woodman et al. 2011) may limit international and CALD HDR students proactiveness in their learning process, and also limit their utilising support services without being prompted by supervisors. Given the fact that support services largely exist as optional services rather than mandatory services, some students may not be motivated to utilise them unless these expectations are clearly communicated to the students. In some cases, they may also falsely assume such services cost money (based on experience in their home institutions). Awareness and cultural sensitivity training can therefore be beneficial to all stakeholders identified in this study as involved in providing support services in the HDR context: students, supervisors and administrative staff.

Finally, language difficulties often can lead to issues of shyness, that may hinder students' ability to ask questions during presentations or tutorials in international students (Chalmers 2006). Coupled with the difficulty in adequately expressing themselves in English, language limitations may cause the students to engage less in seeking support services, and instead rely on peer support or friends from the same culture to address their needs (Chalmers and Volet 1997). This lack of use of supports could affect a student's progress if they have to compete with local students for limited resources such as laboratory space or attention from a

technician (Cadman 2000). For example, , in some cultural contexts, seeking help may be seen as being weak or unintelligent, and social stigmas associated with seeking help when it comes to personal and emotional issues could cause students to avoid seeking help until much later.

While these differences in culture and language may influence CALD and international HDR students in terms of utilising university-based support services, it is also important to minimize cultural stereotyping or generalising of international students from different parts of the world. This cultural awareness training is important for all university stakeholders, including supervisors, support staff, administrative staff, and HDR students. In relation to learning styles, for example, attempts have been made to correct existing perceptions of Asian students. For instance, contrary to popular mythology, it has been shown that south-east Asian students are not all rote learners who adopt a surface approach to learning (Chalmers and Volet 1997). Similarly, the notion that students from south-east Asia are passive learners who do not participate in class has also been challenged, and the cultural perception that south-east Asian students stick together and do not want to mix with local students or that students from south-east Asia lack the skills for analysis and critical thinking or south-east Asian students do not easily adjust their learning to the Australian context have also been investigated to be found untrue. (Chalmers and Volet 1997).

5. Conclusion

This study analysed the types and distribution of support services available to CALD and international HDR students and their supervisors at three Australian universities, and provides a method, context and tool which other institutions worldwide could also use to do a self-assessment of the type and format of services they provide. This study also developed a framework in which such services can be analysed, using such categories as formal/informal, centralized/distributed, general/specialized, and current/anticipated needs, which can facilitate such self-assessment by other institutions, in terms of their specific institutional contexts, needs and student cohorts. The results of these findings will be useful to HDR supervisors and university administrators worldwide to wish to work towards improving support services within their universities in a bid to meet the current and future demands of CALD and international HDR students in Engineering and IT, as well as other fields.

References

- AEI (Australian Education International) 2012a. "Export Income to Australia from Education Services in 2011-12." *Research Snapshot*. <https://www.aei.gov.au/research/Research-Snapshots/Documents/Export%20Income%202011-12.pdf>.
- AEI (Australian Education International) 2012b. "International student numbers 2011." *Research Snapshot*. <https://www.aei.gov.au/research/Research-Snapshots/Documents/International%20Student%20Numbers%202011.pdf>.
- AG (Australian Government) 2011. "Submission to the strategic review of the student visa program." http://www.immi.gov.au/students/student-submissions/_pdf/091a-diisr-sub.pdf.
- Cadman, K. 2000. "Voices in the Air: Evaluations of the learning experiences of international postgraduates and their supervisors." *Teaching in Higher Education* 5 (4) : 475-491. doi:10.1080/713699170.
- Chalmers, D., and S. Volet. 1997. "Common Misconceptions about Students from South - East Asia Studying in Australia." *Higher Education Research & Development* 16 (1) : 87-99. doi:10.1080/0729436970160107.

- Chellaraj, G., K. E. Maskus., and A. Mattoo. 2005. "The contribution of skilled immigration and international graduate students to U.S. innovation." *World Bank eLibrary*. doi:10.1596/1813-9450-3588.
- DIAC (Department of Immigration and Citizenship) 2011. "Fact Sheet - Government Response to the Knight Review of the Student Visa Program." http://www.immi.gov.au/students/_pdf/2011-fact-sheet.pdf.
- Edwards, D., A. Radloff., and H. Coates. 2009. "Supply, Demand and Characteristics of the Higher Degree by Research Population in Australia." *Australian Council of Educational Research*. <http://innovation.gov.au/Research/ResearchWorkforceIssues/Documents/SupplyDemandandCharacteristicsoftheHDRPopulation.pdf>.
- Foster, G. 2012. "The impact of international students on measured learning and standards in Australian higher education." *Economics of Education Review* 31 (5) : 587-600. doi:<http://dx.doi.org/10.1016/j.econedurev.2012.03.003>.
- Larkins, F. 2011. "Australian Higher Education Research Policy Analysis: Higher Degree Research Profile 2000-2010." LH Martin Institute for Higher Education Leadership and Management. <http://www.lhmartininstitute.edu.au/userfiles/files/Higher%20Education%20Research%20Policy%20Analysis%20-%20Frank%20Larkins%20-%20November%202011.pdf>.
- Omeri, A., P. Malcolm., M. Ahern., and B. Wellington. 2003. "Meeting the challenges of cultural diversity in the academic setting." *Nurse Education in Practice* 3 (1) : 5-22. doi:[http://dx.doi.org/10.1016/S1471-5953\(02\)00026-4](http://dx.doi.org/10.1016/S1471-5953(02)00026-4).
- Ramburuth, P. 2001. "Cross Cultural Learning Behaviour in Higher Education: Perceptions versus Practice." *ultiBASE*. <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.202.446&rep=rep1&type=pdf>.
- Woodman, K., J. Trevelyan., T. Sahama., P. Gudimetla., H. Sharda., T. Lucey., A. Taji., R. Narayanaswamy., and P. K. Yarlagadda. 2011. "Chaos or complex systems? Identifying factors influencing the success of international and NESB graduate research students in Engineering and Information Technology Fields." Paper presented at the ICERI2011, Madrid, November 14-16.
- Yarlagadda, P. K., J. Trevelyan., H. Sharda., P. Silva., S. Samani., K. Woodman., T. Sahama., A. Taji., R. Narayanaswamy., and A. Lucey. 2013. "Research supervision of international students in engineering and information technology disciplines." Australian Government Office for Learning and Teaching PP10-1771.

Table 1. Different levels of academic support offered to HDR students at QUT, UWA and Curtin.

Support Type	Description of Support	QUT Provider		Curtin Provider		UWA Provider		Accessible to						
		U- University F- Faculty S- School		U- University F- Faculty S- School		U- University F- Faculty S- School		Int'l students	All HDR students	Faculty Students	Supervisors	Other		
Academic Support	Research Methods- Qualitative and Quantitative Data Analysis	RSC Library and specialised courses on publishing, end note training, copyright issues. Liaison Librarians	U F	OTL ORD Specialised library courses Faculty level liaison librarians	U U U F	CATL GRS- 1st point of contact Faculty level liaison librarians Research themes/disciplines /centres provide support across faculty on research methods appropriate to theme	U U F U							
	Technical Writing	ISS -weekly writing circles SEF-academic writing sessions	U S	ELC - English support in writing	U	GRS -writing retreats and special workshops on scientific publishing	U							
	Computer Support	HPC Research support IT Services - face to face and online training	U U	HPC support	U	HPC support School based courses providing stats consulting, CMC for electron microscopy ivec supercomputer centre provides support, also numerous specific course on software packages such as MATLAB, LabVIEW, Mathematica	S							
	Preparation for meeting milestones	SEF_Preparation for stage 2 IGR QRSnet run workshops for stage prep	F U	No formal process, but help through faculty for 6 months and confirmation of candidature	F	School and research group seminars	S							
	Research Commercialisation	qutbluebox	U	ORD	U	OIRS provides comprehensive support including when appropriate, negotiation and drafting of confidentiality agreements, patent applications, licensing agreements, etc.	U							

Note: International Student Services (ISS) Research Student Centre (RSC) Centre for Advanced Teaching and Learning (CATL) Office of Director of International Graduate Research (IGR) e-Grad School Australia (e-Grad Aus) High Performance Computing Support (HPC) Doorway to Research Website (DR Web) Office of Teaching and Learning (OTL), English Language Competency (ELC), Science and Engineering Faculty (SEF), Office of Research and Development (ORD), Graduate Research School (GRS), Office of Innovation Research Services (OIRS), QUT Research Students' Network (QRSnet), High Performance Computing (HPC)

Table 2. The different levels of administrative and academic support available to HDR students at QUT, UWA and Curtin.

Support Type	Description of Support	QUT Provider			Curtin Provider			UWA Provider			Accessible to				
		U- University	F- Faculty	S- School	U- University	F- Faculty	S- School	U- University	F- Faculty	S- School	Intrnal students	All HDR students	Faculty Students	Supervisors	Other
Administrative Support	Information support	.DR Webpage .SEF Student induction -Small group & quarterly Faculty level .SEF Survival Guide	U F F	.ORD .Student inductions at Faculty and Uni levels	U	.My Research Space forum .GRS Web site .Student inductions esp on safety: safety induction mandatory to gain access to laboratory equipment	U U								
	Administration Skills support	SEF- supervisor admin training	F	.ORD	U	.GRS	U								
Language Support	English Language support through writing skills and other initiatives	FLDP-SEF	F	.ELC	U	.CEL .Supervisors have funding for specific language support when needed	U								

Note: Graduate Research School (GRS) e-Grad School Australia (e-Grad Aus), Curtin University Postgraduate Association (CUPSA), Doorway to Research Website (DR Web) Centre for English Language Teaching (CELT)

Table 3. Social and settlement support for international HDR students at QUT, UWA and Curtin.

Support Type	Description of Support	QUT Provider U- University F- Faculty S- School	Curtin Provider U- University F- Faculty S- School	UWA Provider U- University F- Faculty S- School	Accessible to								
					Int'l students	All HDR students	Faculty Students	Supervisors	Other				
Settlement and Social	Accommodation	.ISS .DR Web	U U	.CUPSA web site .facebook page	U U	.My Research Space website .GRS Web site	U U						
	Spouse Support	.ISS run Women's Group- for spouses of Int'l HDR students	U	.No official Service- Individual groups on Campus	U	.No official Service_ individual groups on campus. .Social functions organised by most if not all research groups and Postgraduate Students Association	U						
	Pastoral Care	.HDR directors IGR	S U	.School or deptatment specific PG coordinator .Faculty Grad Committee	S F	.School level PG coordinator	S						
	Cultural & Social Support	.ISS- supported programs and activities .Faculty level cultural and social activities for internationald and local students	U F	.Health & recreation, on-site child care, direct bus to campus, prayer hall/mosque on campus, food services on campus	U	.GRS-Assistance in finding housing .Help with tutoring in residential colleges in return for accommodation	U						
	Counselling	.C&C run specific workshops on time, stress management	U	.For all students	U	.For all students	U						
Other	Supervisor Support Other Support	.SEF info Hub RSC- Workshops on Supervisory Solutions E-Grad School Australia - virtual training for postgrad students, their supervisors, post doc fellows	F U	.ORD	U	.GRS by phone .Research Services for supervisory suport-Ethics	U						

Note: International Student Services (ISS) Office of Research Development (ORD) Graduate Research School (GRS) Faculty Language Development Program (FLDP-SEF) Centre for English Language Teaching (CELT) Doorway to Research Website (DR Web) Careers and Counselling (C&C)

Table 4. Different support services as viewed from a delivery point of view.

Service Distinction	Service Description	Examples
Formal versus informal services	<p>Formal services: those directly funded by the university within the university location</p> <p>Informal services: those not funded by the university, yet offered through a body affiliated with the university</p>	<p>-Social support services are offered formally in QUT and informally through social clubs in Curtin and UWA</p> <p>-Language support is offered formally in all three universities</p> <p>In UWA, language support for students is also available through special funding to supervisors on a needs basis</p> <p>- Milestone preparation is offered formally at QUT and candidates submit a progress report (which is formally assessed), while it is informally done in UWA and Curtin.</p>
Centralised versus distributed services	<p>Centralised: service delivery operated from central location</p> <p>Distributed: services exist at different levels and locations according to need</p>	<p>- At QUT, High performance computing (HPC) is centrally located, but have personnel specialising in different areas as well as software programs. At UWA HPC support is available at school level and is specialised to meet the needs of the school.</p> <p>- Integration of computer services at QUT ensures that all the computer needs are solved and dealt by IT Services without duplicating services.</p>
General versus specialised services	<p>General: non-dedicated support services</p> <p>Specialised: specially dedicated support services</p>	<p>- Curtin: Language support offered as a specialised service in Curtin via English Language Competency (ELC), while at QUT it is offered via faculties through Language Development Programs (LDP) with LDP workshops catering for key milestones in the HDR students' journey.</p> <p>- UWA: Accommodation support is offered for HDR students for free in exchange for tutoring as a general non-dedicated service while ISS is a</p>

		<p>dedicated service provider for accommodation for international students at QUT.</p> <p>-Counselling often is a stand-alone specific service, located in a different building due to the nature of the services as privacy is important.</p>
<p>Current needs versus anticipated needs</p>	<p>Current needs are impending needs posed by students</p> <p>Anticipated needs cater for future needs that may arise students or graduates</p>	<ul style="list-style-type: none"> - Curtin provides a mosque for the Islamic students - The 3 universities have a career centre and that provides help to students. -Changes in trends in the future job market which may need to be addressed to maintain relevance fall under anticipated needs. - Anticipated needs are also culture specific aimed at where universities focus their attention for attracting international students and promoting local students towards- e.g. China in the Asian Century - With a lot of services available on applications on mobile phones, there is an anticipated need to create mobile based platforms easily accessible to HDR students for support.

Note: This comparison illustrates the variation of how services are provided across the three institutions. Whether the distinctions between formal/informal, centralized/distributed, general/specializes, or current needs/anticipated needs arise from institutional or cultural differences between institutions, or whether these differences impact student outcomes is beyond the scope of this study.