

Undergraduate and Beyond – Retaining Undergraduates for higher degree research study in the School of AME at UniSA

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***Abstract:** Over the past 10 years in the School of Advanced Manufacturing and Mechanical Engineering (AME) at the University of South Australia, fewer than five students studying in AME's undergraduate programs have gone on to undertake a higher degree study by research. To find out why this is the case, a survey of all AME undergraduate students was performed to gauge their interest, understanding and attitude toward postgraduate study and research as a future career. The survey results indicated that the current undergraduate program did not expose the students to the possibilities of research as a future career or the viability of postgraduate study. The results from this survey have been used to develop a first step strategy to expose undergraduate students to research at the School of AME. This paper proposes possible solutions and discusses the development of a nurturing program which has been implemented as a major strategy to address this issue. To gauge the success of this strategic program an additional survey will be performed at the completion of the strategy's first year.*

Introduction

The University of South Australia (UniSA) is a member of the Australian Technology Network (ATN) and is an amalgamation of former Institutes of Technology. Like other ATN Universities, UniSA shares a long history of working in partnership with industry and the professions (ATN Network, 2009). In UniSA's school of Advanced Manufacturing and Mechanical Engineering (AME) the majority of students aim to work in industry. Therefore much of AME's current program structure is focused on developing work-ready students with practical experience rather than research based graduates. Consequently, only five of AME's graduates have gone on to a higher degree study by research in the last 10 years. Students studying in the School are typically from low socioeconomic northern or rural areas of Adelaide. As discussed by Rodgers (2006) these low income areas are typically unrepresented in research degrees, where students cite debt or risk of debt as the main reason for not pursuing further study. There are also very few opportunities for students to gain exposure to research in order to consider research as a future career.

The School of AME seeks to change this trend. A survey of all AME undergraduate students was performed to find out the students' interests, understanding and attitude toward postgraduate study and research as a future career. The survey results indicated that the current undergraduate program did not adequately expose students to the possibilities of research as a future career or the viability of

postgraduate study. One key strategy which has been implemented to address this issue and potentially increase the number of students choosing to continue with postgraduate study in AME is the development of a program focusing on supporting undergraduate students who excel academically.

Survey and the analysis of the results

As an initial investigation to understand student perceptions of postgraduate study and to further develop the nurturing strategy, a survey was distributed in late 2008 to all current AME undergraduate students. The results of the survey are crucial in order to analyse and understand students' current attitude towards research as a future career and to suggest strategies AME should explore to increase students' interest in postgraduate study.

Survey responses were received from 123 students in second, third and final years of study. The characteristics of the survey respondents are shown in Table 1, where it can be seen that the majority of students are male, 18-24 years of age and Australian citizens.

Table 1: Characteristics of the survey respondents (n = 123)

Survey Response				
Gender	Male:	98%	Female:	2%
Australian Citizen or permanent resident	Yes:	66%	No:	34%
Age	18-24	25-34	35-44	≥ 45
	76%	19%	3%	2%
Predominant Year Level	Second	Third	Final	
	16%	44%	40%	

Out of the students surveyed, 29% have considered a career in research. The most popular reasons for considering a career in research include; 34% of respondents indicating that they wanted to advance and develop new technologies, and 21 % indicating they had an interest in a particular research area. The main reasons why students have not considered a career in research can be broken down into those who are eager to start a professional career (34%), those who are eager to earn a wage (28%) and those who indicated that they perceive professional experience more important than further study (22%).

Although only 29% of students surveyed are considering a career in research, 71% of the survey sample has indicated that they are interested in further education after graduating with an undergraduate degree. Out of these students, 51% are considering a Master of Engineering, 17% are considering a Master of Business Administration and 16% are considering undertaking a PhD. The main reason for undertaking further study include; further career opportunities (32%), enhancing knowledge gained in undergraduate degree (22%), interest in a topic (18%) and valued by prospective employers (15%).

When asked how much they know about studying for and completing a Masters degree, 50% responded that they have no idea, 42% responded that they have some details and 8% know most details. When asked how much they know about studying for and completing a PhD, 66% responded that they have no idea, 32% know some details and 2% know most details.

When asked what the School could do to encourage consideration of a career in research, students suggested the need for more fundamental information about what is involved with postgraduate study. As commented by these students.

“Let students know earlier on what GPA is required and what you can get out of it”

“Provide greater information on how to go about a career in research. Information is scarce.”

“The benefits that it offers, the knowledge I could gain & if I will get some kind of pay for my efforts. If all these are addressed, I would be very interested”

These results indicate that current methods of informing students of the possibilities of Masters and PhD study are not effective and should be improved.

Students did see the value of further education, with 58% indicating that a research degree is valued by employers and 64% indicating that a research degree will help with your future career. However, there was a perception that further study may adversely affect career prospects, reducing their chance of working outside of a university or receiving a high wage, as commented by this student when asked why they would not consider postgraduate study.

“Poor pay, can make unemployable”

This aligns with an article printed in a popular online job search website (CareerOne, 2006) which suggests that in Australia a PhD should not be included in a resume unless it is directly related to the job you are applying for.

Strategies and possible solutions

The results and comments from the survey suggest that the school is not providing enough information on careers in research, postgraduate study and the research opportunities within the school. A strategic plan to change this tendency has been developed and initial steps that address key concerns will be implemented in the second half of 2009:

- To increase the exposure of the school research activities to the undergraduate students:
 - Placement of posters on the walls of common areas within the school to advertise current and past topics of PhD and master degree study.
 - Update the school’s postgraduate webpage to include video and photos of current projects and interviews with current and past postgraduate students.
 - Create more of a presence for the research centres, using glass cabinets to display information on current research projects, scholarship opportunities and current publications
 - Invite undergraduate students to the annual school research student day
 - Create a Facebook page to communicate current research interests of the school
- To provide information on careers in research and postgraduate study:
 - Organise at least two seminars per year to present the benefits of further study and scholarship opportunities
 - Invite outside researchers to give a presentation on “life with researches”
 - Organise a visit to research institution/centres

On top of these, the following long term strategies are considered:

- Offer undergraduate students part time works as research assistants to senior academics with research centres in the school
- Explore opportunities for group research publications in undergraduate classes
- Develop an advanced graduate certificate to provide students more research intensive courses

Any strategy the school implements will require a long term commitment by academic and professional staff to ensure it is both sustainable and successful. As stated by Ehrenberg (2004) *“Involving undergraduate students in research, both within and outside of the classroom, is a very time-consuming activity. However, the benefits I receive from doing this have been enormous.”*

Development of Nurturing Strategy

In addition to the strategies described in the previous section, the school has introduced a new program to specifically recruit undergraduate students into the postgraduate study. This program aims to encourage and support undergraduate students who have the capability to commence research after their bachelor degree. The academically advanced students with high Grade Point Averages (GPA) are invited to participate in the program which commences at the beginning of the student's third year until the completion of their degree.

Under this program students will be invited to regular seminars held by AME's academic research staff to discover the range of pathways, research activities and academic skills within the School, as well as scholarship and funding opportunities for the further study by research. Students will be asked to choose an area of interest to pursue research. At the end of the third year, they will be assisted to apply for a UniSA Research Vacation Scholarship to conduct research in one of the School's Research Centres or Institutes for 12 weeks during the summer holiday break. Following this, they could continuously work on their final year project in the same research topic. They will be encouraged to publish a conference paper or possibly a journal paper in their final year of undergraduate study. All of these activities will give students a significant advantage should they wish to continue on to pursue a research and/or academic career. The program aims to incorporate activities of work experience, additional academic activities and training, and supervision of a final year project deeply embedded within a research setting in order to increase the probability that these academically advanced students will consider research as a prospective career path.

Conclusion

Although the authors believe there is much merit in continuing with the development of the nurturing program, initial fundamental administrative steps should be implemented to inform students of the benefits of further study. The success of this strategy will be measured through surveying the students again in the end of 2010 (to see whether student attitude to research has changed), increase in the number of applications for vocational research scholarships and in the long term, an increase in the application for masters and PhD study.

References

- ATN Network (2004), History. Accessed at: <http://www.atn.edu.au/about/history.htm> on 27th June 2009
- Ehrenberg, R. G. (2004). *Involving undergraduates in research to encourage them to undertake PhD study in economics* (CHERI Working Paper #56). Accessed at: <http://digitalcommons.ilr.cornell.edu/workingpapers/51/> on 29th July 2009
- Rodgers, M (2006), *poor less likely to study for PhD*, National Postgraduate Committee (NPC), Accessed at: <http://www.npc.org.uk/media/press/THES04aug06> on 29th July 2009
- Southam, K. (2006), *To PhD or not to PhD*, CareerOne, Accessed at: <http://www.careerone.com.au/news-advice/career-development/career-coaching/to-phd-or-not-to-phd-20071205> on 29th July 2009

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