Protecting Small Surveying Programs

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SUMMARY

Globally, tertiary programs offering surveying and geospatial qualifications are under threat. Whilst the tertiary landscape may differ in many countries, fundamentally the importance of surveyors to a functioning society is universal.

In the last three decades in Australia, the decline in Commonwealth government funding has forced universities to search for revenue elsewhere firstly through student fees for local undergraduate students but more lucratively for higher fees from international students. Concurrently, the rise of university rankings in the early 2000s, to distinguish status, has supercharged fees for international students and become a significant source of revenue for Australian universities. Education has become a commodity.

In this new world of commodified education, small programs are vulnerable to university administrations looking to rationalise their course offerings. Heads of surveying programs, which are often small, must therefore advocate to protect their discipline.

This presentation will use the BE(Surveying) program at UNSW Sydney, Australia as a case study to present strategies to assert the importance of small surveying programs and to hopefully avoid regrettable decisions by university administrators.

Receptiveness to structural change, course delivery, relationships with the target profession that graduates will supply, developing talking points highlighting the value of a program to the wider community and communication within the university and beyond are all conferred.

It is argued that surveying program heads are best placed to advocate for the protection of their program and must take a leadership role. This presentation is aimed at members of the FIG Commission 2 to offer some insight and strategies to support this advocacy.

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1 BACKGROUND

It is recognised internationally that secure, well defined property rights underpin a stable functioning economy. The ability to verify boundaries at low-cost and legal measures to minimize land-related conflicts reduce transaction costs and enable national wealth (Deininger & Feder, 2009). Surveyors are the only professionals with the requisite education, professional training and legal authority to perform these tasks. Surveyors provide unique and valuable services that are crucial for infrastructure development which enables economies to grow and prosper (BIS Oxford Economics, 2023).

Surveying is a niche, practical profession. Surveyors may have a technical qualification or a university degree (which can lead to a professional qualification) or a postgraduate academic degree providing a scientific or policy pathway.

Surveyors provide services for engineering, construction, architecture, planning, land law, mining, hydrography, disaster management, environmental monitoring, Earth science and research. University programs spend much of their curriculum teaching measurement science and statistics both with practical hands-on activities and theoretical concepts and apply these fundamentals to many associated applications. In short, surveyors know how to measure with precision, accuracy and uncertainty of observations which provides confidence and authority in the interpretation of these measurements.

The role and purpose of surveyors is well known to surveyors, but given the small size of the profession, community awareness of the importance of surveying is not well appreciated more broadly. It is contingent therefore on all members of the profession to communicate this message externally. This is our best protection.

2 COMMODIFICATION OF EDUCATION

Education globally has become a commodity. Whilst some European countries continue to offer taxpayer funded “free education”, many other countries charge fees (often exorbitant) for the privilege of studying at their institutions. Australia has morphed into the latter category and will be used as a case study in this paper.

Australia is a federation of 8 states and territories. It is a Commonwealth country, and the federal government is responsible for funding the 39 public universities in Australia (Cassidy,

2025). The Whitlam Labor govt introduced free education in 1974 (Arrow, 2025). In the 1980s, the federal government in Australia was contributing around 80% of the sector's funding (Horne 2020, Turner 2025). The Hawke Labor government re-introduced fees under the Dawkins reforms in 1989 with an income contingent loan system called HECS (Higher Education Contribution Scheme) (Croucher et al, 2013, Williams 2025). Student fees were designed to supplement a reduction in Commonwealth government funding which in 2025 has dropped to around 40%. These reforms also enabled a more than doubling of the size of the university sector in Australia. During the Dawkins era of rapid growth, the Hawke government also introduced a full-fee-paying system for international students (Ibid).

With subsequent cuts from the incoming Howard government in 1996, there was increasing pressure on the university sector, and the international student revenue stream became much more prominent in the early 2000s. But how does a prospective international student judge which is the "best" university? This has been addressed by international rankings. In 2003, the first major global ranking, the Academic Ranking of World Universities (AWRU, or Shanghai Ranking), was published, followed by the Times Higher Education (THE) and the Quacquarelli Symonds (QS) (Roberts & Harvey 2019, ARWU 2025, QS 2025, THE 2025).

A change in government policy in Australia enabled universities to charge what the market could bare. Chinese students were very persuaded by rankings and therefore higher fees could be charged for higher ranking universities which supercharged the cycle (Norton, 2020). Indeed, by the late 2010s, higher education became Australia's third largest goods and services export behind iron ore and coal. It is currently ranked fourth (DFAT 2025) largely due to COVID shutdowns and more recent domestic posturing on immigration policy. This has exposed this reliance on international student revenue for the university sector in Australia.

The pressure on university budgets in Australia therefore exposes smaller programs such as surveying. In short, the commodification of education in Australia is a threat to surveying programs.

3 PROTECTING SURVEYING PROGRAMS

In response, Heads of Surveying programs must implement a multi-pronged approach to protect their discipline. They must ensure that the number of students in the program is sustainable through marketing activities. They must educate their senior managers within their university structures, such as Head of School, Dean and Vice Chancellor levels, of the importance of surveying to the wider community. They must be open to change and malleable with proposed restructures and course delivery methods. They must engage deeply with their local profession and pursue them for support. And they must communicate widely to ensure the profile and value of the surveying profession is well understood in the community.

3.1 Marketing

Without students, no program is sustainable. Marketing for surveying programs must be ongoing and multi-faceted (Roberts & Iredale 2010, Roberts 2022a). In NSW, talking points have been developed for presentations and conversations with prospective students, teachers, parents, industry representatives etc. Students will most likely enjoy a career as a modern surveyor if they have the following attributes:

- Students who enjoy **maths** (especially geometry),
- Enjoy the **outdoors**,
- Love **maps** (paper, digital, games (ie Minecraft)) and
- Enjoy **gadgets** (laser scanners, drones, robotic total stations etc)

These four dot points provide a quick "elevator pitch" for short conversations.

Surveying has a great story to tell. There is a huge shortage of surveyors in Australia (and indeed in many parts of the world) (BIS Shrapnel 2013, BIS Oxford Economics 2023) which means it is easy to get a job. It is well paid, often requires travel to interesting places and offers a diverse range of disciplines: land surveying, mining, construction/infrastructure, hydrographic, geodesy, land administration policy. We, as advocates, need to tell that story often and broadly and use lots of pictures. Surveying lends itself to persuasive images.

There are opportunities to work for a dedicated surveying consultancy and become an equity partner, to work in a large engineering company, to work in mining surveying and be very well remunerated, to start one's own small company, to work in government or policy or undertake further study and become a research scientist in geodesy, GIS or remote sensing.

The messaging and branding must be consistent on marketing materials such as brochures, websites, videos, university information. It is often helpful to engage a marketing professional to oversee this consistency and help with the tone of the language.

That said, marketing collateral should be carefully edited by Heads of programs or experienced staff to ensure that the messaging is correct and consistent. University level marketing departments may produce their own materials which may conflict with the standard messaging. Program Heads need to be on top of updates, websites, national/state level generic documents such as the University Admissions Guides which students and parents use to choose courses. It can be challenging to ensure the right messaging is used ubiquitously.

The range of study options for surveying must be well understood and presented from vocational offerings to university and post graduate study and all pathways in between.

Often target audiences for marketing are high school leavers looking to undertake further study. Roberts (2022a) lists university Open Days, high school information days, a so-called "bus tour" (at UNSW) and encouraging maths education from primary school with a Maths prize.

In partnership with tertiary education institutions, industry should also provide hands-on marketing activities. Surveying has a natural advantage with lots of interesting high-tech equipment which can be used to enrich educational, engaging activities and hopefully generate some curiosity from potential students. Roberts (2022a) presents some examples.

However, one-off, hands-on activities are not enough to convince a student to devote themselves to multiple years of study. In the Australian state of NSW, the Surveying Taskforce (industry marketing body) have developed a dedicated website to encourage students to undertake work experience as a next step to learning more about surveying (NSW Surveying Taskforce 2025). In Australia, high school students are encouraged to undertake work experience through their school in yr 10 (age 15). At the end of the activity (ie Surveying Unleashed, Diversity Day, Maths in Surveying Day) students are offered the chance to try work experience. Students submit their name and area where they live on the website, and they are introduced to a local surveyor in their area for a week of work experience.

Surveyors are also encouraged to prepare well and show their charges a range of indoor and outdoor tasks and encourage them to stick with surveying (Roberts, 2022b). Work experience is a good filter and a persuasive next step.

The annual UNSW Open Day features a scheduled lecture about surveying. The NSW surveying taskforce informs their database of active students about the date and time and encourages attendance. Similar uses of this database of interested students are used for other universities and vocational institutions. All these tasks build on each other and show students that there is a pathway into the surveying profession rather than a series of apparently disconnected activities.

3.2 Educating Up

Whilst marketing is important to ensure sustainable numbers of students in programs, senior managers within tertiary institutions often only see student numbers in programs. It is therefore contingent on Heads of surveying programs to engage with their senior managers and educate them of the importance of surveying to the wider community. Senior managers

(Head of School, Dean, Vice Chancellor etc) are often very internally focused and can't possibly know the basic role surveyors have in society.

By way of example, the sorts of talking points that are used in NSW are listed below:

- Registered Land Surveyors (RLS) are the only professionals who can legally define property boundaries
- RLS are regulated by the NSW Surveying and Spatial Information Act (2002)
- The Board of Surveying and Spatial Information (BOSSI) as described in the Act regulate the practice of boundary surveying in NSW
- There are only ~800 RLS in NSW – a small number
- A RLS first needs a 4-yr degree recognised by BOSSI as first step to registration
- Only UNSW and Uni Newcastle offer such courses in NSW (we are small)
- There is a skills shortage in surveying, and this is holding back development in NSW (BIS Shrapnel 2013, BIS Oxford Economics 2023)

Basic points such as these can be used as a springboard to more current conversations. For instance, in NSW, the University of Newcastle, due to financial pressures (see section 2 above), have threatened to pause their program in 2026. This, in the middle of a Housing Crisis and with an on-going skills shortage in surveying nationally. The local surveying profession is therefore supplied by only one NSW tertiary institution for a state of over 8M people! Such information, it is hoped, puts pressure on senior managers within universities to seek alternatives to cutting small programs.

Listing the various large infrastructure projects that senior managers would be aware of is also a good strategy to focus the mind. Iconic projects such as the second Sydney airport and its transport links, the Snowy 2.0 (an iconic renewable energy project), a new Sydney Harbour tunnel to help address traffic problems, the new extremely popular Sydney metro, the new Barangaroo foreshore precinct and even proposed projects such as the very fast train from Newcastle to Sydney. Of course, the critical role of surveyors in addressing the housing crisis as well as just ongoing development and construction activities. All will require surveyors and therefore university programs supporting these graduates have a significant impact on a functioning society.

These more personal stories should be presented to senior managers in a positive way, to make them feel like they are enabling development in their own state that they enjoy. Give them a sense of ownership and therefore a responsibility that their actions can affect the amenity of the society in which they inhabit. It also demonstrates that, as a Head of a program, you are deeply engaged with your profession. This engagement with the community is something that universities seek to assert. Therefore, cutting such a program, without regard for the community impact, would negate all these gains.

3.3 A Diversity of Program Offerings

Nowadays, internationally, there are very few dedicated Schools of Surveying/ Geomatics/ Geospatial et al. Typically, there is a surveying program on offer within a larger school. This was the case at UNSW for the former School of Surveying and Geospatial Engineering (SAGE) within the Faculty of Engineering, which was merged with the School of Civil and Environmental Engineering (CVEN) in 2013. The Bachelor of Engineering (Surveying) was thankfully retained and streamlined to align better with the other 4 yr BE(Civil) and BE (Environmental) programs offered in the School of CVEN. This streamlining then enabled a new BE (Civil)/B Surv double degree offering two recognised qualifications in just 5 yrs. When introduced in 2016, the numbers tripled in response and have remained sustainable ever since.

Even though "surveying" does not appear in the name of the school, the re-structure has "saved" the program. CVEN is a large, diverse school offering majors in Structures, Construction, Geotech, Transport, Water, Coastal management, Humanitarian engineering and now SAGE. This diversity offers many opportunities for collaboration, especially given the range of high-tech geospatial equipment associated with surveying such as laser scanners, high precision GNSS, robotic total stations, drones with a range of sensors and remote sensing expertise that can be applied to a diverse range of engineering applications. Collaboration breeds respect. Surveying is now resident in the largest and highest-ranking School of Civil Engineering in Australia and top 20 in the world on the QS World University Rankings (QS 2025). This is great for exposure, presence and partnerships within the school.

Surveying at UNSW therefore has the highest entry requirement of any surveying program in Australia. Some, in the industry, see this as a "brake" on student numbers, but it also welcomes students with the most potential into the discipline of surveying. UNSW produces leaders.

There is a diversity of surveying programs across Australia and New Zealand producing different sorts of graduates which supply the surveying profession. The University of Southern Queensland (USQ) offers distance education and has a very flexible entry pathway from a 2-yr vocational program that can be progressed to a 3-yr and finally a 4-yr degree recognised for professional registration with exit points at all years. Consequently, USQ has by far the highest number of students enrolled in their programs, as students can enroll from all over Australia. This flexibility is very convenient for remote/regional students or mature entrants who may have family commitments and struggle with the time commitments associated with face-to-face programs. Practical aspects of the curriculum are handled with periodic "residentials" where remote students must attend for an intense period of hands-on exercises. This mode of delivery suits a certain segment of the market.

In contrast, the University of Otago in New Zealand offers the only program for the whole country (population ~5M). It offers face-to-face education only and all students must travel to and live in Dunedin on the South Island. Despite this apparent inflexibility, the course remains very popular, the student cohort is very close, and graduates are highly sought after. Many travel to Australia seeking higher remuneration.

The University of Newcastle is more like a regional university as the cost of living in Newcastle is cheaper than Sydney and therefore rural students are more likely to be attracted. Similarly, the University of Tasmania has a smaller cohort (and always has) due to its modest population (~0.5M on a small island), however its proximity to Antarctica ensures high quality research. Curtin University supports the large mining industry in Western Australia which preserves its student numbers. In South Australia, one program was terminated and another recommenced at Flinders University combining Planning, GIS and Surveying in a common first year which becomes discipline specific in the senior years. There is strong industry support to ensure this new program will be successful. It is currently in its 3rd year.

This section of the paper has tried to demonstrate that different programs have different strengths and natural advantages. Heads of surveying programs should be cognisant of their circumstances and seek to design their programs and offerings creatively to maximise their sustainability and protect against potential closures. This is a continual task.

3.4 Industry Support

There is a perception in the wider community that universities are disconnected from society. Consequently, universities like to demonstrate industry engagement. In surveying there is also a disconnect between the sort of work that many graduate surveyors undertake and cutting-edge research that will attract research metrics which mostly drive higher rankings. This gap has widened in recent years as the prominence of rankings has increased. Replacing academic staff in a surveying program is therefore more challenging. Universities are loathe to employ a teaching academic who may take the lion's share of the teaching load but will contribute little to the research metrics (Roberts 2020). Industry, on the other hand, would like authentic teachers that understand their profession and may be less concerned with research performance.

A solution to this conundrum has been achieved at UNSW. Building on an existing program within the School of CVEN for a part-funded industry Chair of Geotechnical Engineering, a similar proposal was developed for a half-industry funded Education Focused[1] (EF) Lecturer in Surveying to replace a retiring EF Senior Lecturer (Roberts 2024).

[1] Education Focussed is a new role at UNSW. Academics teach 80% + 20% admin. Most academic positions are combined track = 40% research + 40% teaching + 20% admin. Research only = 80% research + 20% admin.

A consortium of five industry partners was formed who provided half the funds for a Lecturer position. The university was happy to provide half the funds to top-up this replacement position. The five companies are: SDG, MNG Land Partners, CMS Surveyors, Land Surveys/ Intelli-spatial and Lyntons Surveys. They each pay 1/5th per yr for 3 years (initially) and the school builds a relationship with the consortium partners through various activities such as: Careers Market for networking and job hunting, Elite student Breakfast, Guest lectures, combined Hons research thesis projects, engagement on capstone courses and survey camps, further research relationships with postgraduates students, representation on the school industry advisory committee, liaison on curriculum updates etc.

The motivations of the companies to join the consortium are varied, but fundamentally all want to ensure the quality of the professional/vocational part of the program is maintained by having a surveyor teaching surveying students how to be surveyors. Access to the top graduates is also attractive but not prescribed in any way. Graduates are free to work where they wish. Brand association is also persuasive for both parties. Universities seek industry partnerships and the 5 consortium partners are associated with the highest-ranking surveying school in the country. The consortium structure encourages a closer relationship which is restricted only by the imagination and energy of the contributing partners. The relationship is developing and it is hoped it will be sustained indefinitely. The "model" part-funded industry Chair of Geotechnical Engineering mentioned above has been in place for more than 2 decades.

Another important aspect of industry support is engagement with professional associations. In NSW, the Institution of Surveyors NSW is very active and provides great support and many Continuing Professional Development (CPD) opportunities especially for Registered Land Surveyors who require a minimum of 15 CPD points per annum to retain their right to practice.

Heads of surveying programs should be involved with professional organisations either by contributing to committees (or encouraging their staff to do so), by attending and speaking at industry conferences, encouraging student participation and membership (usually free) and engaging with current affairs relating to the surveying profession.

Surveying Australia (formerly called Consulting Surveyors NSW/ National) is the business association for surveyors. It is very active and supports surveying businesses in many valuable ways. From a university perspective, these associations have commissioned external consultant reports such as, "Determining the Future Demand, Supply and Skills Gap for Surveying and Geospatial Professionals (2022 - 2032)" BIS Oxford Economics. It is one thing to "claim" that there is a skills shortage, but it must be backed up by numbers; and numbers that university senior managers and government will trust. A university program preparing a report about its own program may not be seen as objective. These commissioned consultancy reports are expensive. Heads of surveying programs across Australia are therefore indebted to

their professional associations who have funded these reports and are referenced broadly and often to advocate for the surveying industry.

3.5 Communicate Widely

Heads of surveying programs should also communicate regularly and widely the importance of surveying to society, their challenges, their industry engagement and their successes. They need to foster relationships with the target profession that graduates will supply.

This can be achieved by volunteering to speak at industry conferences and seminars, writing magazine articles about recent student projects with lots of pictures. LinkedIn is an excellent medium for broadcasting small stories of interest to a wider audience. It is important to curate the followers on LinkedIn, to always include a bright picture and to write in short, snappy sentences. Use the @ and # symbols to link to themes across the LinkedIn space. Keeping a regular presence leads to a higher profile and is well regarded by university management.

As the Head of a program, there may be opportunities to speak in radio interviews or on podcasts. It is worthwhile seeking media training to learn how to speak and not say something regrettable. Sometimes writing a letter to the editor of industry magazines provides some good outreach. Applying for awards or encouraging staff and students to apply for awards raises the profile of the school and the profession. Volunteering on industry committees is also very beneficial. A lot can be learnt on industry committees, it can keep teaching materials relevant, and it also provides good networking opportunities and possible student projects.

Heads of surveying programs must communicate regularly and widely within the university and beyond to protect their small programs.

4 CONCLUDING REMARKS

University programs for surveying are vulnerable. As a small, niche but none-the-less important profession, it is contingent upon Heads of surveying programs to not only offer a modern, relevant and accessible education to students, but they are also charged with the responsibility of protecting the program from termination due to numerous external factors.

This paper has sought to list these factors and offer potential solutions using the UNSW surveying program in Sydney, Australia as an example. This is by no means an exhaustive list and it is hoped that this paper will prompt conversation and sharing of other experiences, ideas and support.

Different countries and different jurisdictions will experience different pressures. Heads of programs must be aware of their local circumstances and must be creative in addressing these issues.

Heads of programs must also “reach out” to their wider profession for help. They cannot possibly do it alone. And this is perhaps the most important point of this paper. The whole industry/profession must be engaged in the solution. Educators, professional associations, businesses, governments, professional surveyors, technical surveyors and even students. All can make some contribution, and all should be welcomed positively. The culture in NSW has been nurtured and developed over many decades and although there are still many external pressures on the profession, we are stronger if we work together and respect each other’s contributions.

Adopting some or all the practices discussed in this paper by no means guarantees the sustainability of surveying programs but hopefully alerts (and encourages) discipline heads to be constantly on their guard and promoting their programs.

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BIOGRAPHICAL NOTES

Craig Roberts bridges the gap between teaching and research, industry and academia in the field of Surveying and Geospatial Engineering. Expanding from a humble degree in surveying, pioneering experiences using GPS for tectonic studies internationally and a PhD in GPS volcano monitoring have ignited his passion for teaching and sharing his expertise. Currently Head of the BE(Surveying) program at UNSW, Sydney he is deeply connected with the local/national surveying profession. His quest is to expose his students to the latest advances in GNSS positioning, laser scanning, UAVs and high precision surveying and unleash them on the profession with a "growth mindset".

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