

EDUCATION – WHY IS IT IMPORTANT?

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SUMMARY

The first line of a Pink Floyd song ‘Another Brick in the Wall’ is ‘**we don’t need no education**’. Taken literally this is far from the truth in any profession or trade that we might enter. Education is fundamental for those wanting to move ahead in life. Whilst university education is not suitable for everyone, many choose to study at TAFE or choose to gain employment in order to maintain a living standard and to learn.

We all have choices to make and these choices may change as we grow older. The days of staying in a particular job or with a company have changed and over a lifetime we may have as many as five new jobs or more.

University education is for those who want to study for a profession at a higher level. This might be medicine, pharmacy, architecture, law, surveying (geomatics) or some other profession. The range of available study units is quite extensive.

Some universities have introduced a five year qualification which involves studying an undergraduate course such as science and then going on to study a Masters in an area. This is the case at Melbourne University in Victoria Australia, where students undertaking Surveying, for example, are required to first take an undergraduate course and then a Masters Course to complete their qualification.

The view from academia seems to be that the undergraduate course is a general qualification leading into a Master’s course. However, students have spent a total of twelve years working through secondary schooling in order to gain entry to a university so they can undertake studies in a specialised area. They do not need another generalised course to move into a specialised area. They want to study their chosen profession and then move into the professional arena to practice it.

One of the views from a head of department is that some of the basic attributes of a profession need not be taught during a course but learnt by the student offline in their own time. A couple of examples may help to highlight this as a problem.

- a) Students undertaking the Cadastral Law Unit need to know how to use the various instruments in order to be able to collect the right data for the assignments. Without this

basic knowledge a large amount of precious time is spent on teaching procedures which should have been taught and practiced through the years of tertiary study. For final year students, not knowing these processes is disastrous for their working opportunities.

- b) Imagine if medical students were not able to learn basic procedures during their course and had to learn them on You Tube for example. They are at university to learn these procedures and applications from experts in the various fields.

Universities value research and there is no doubt in their ability to undertake this course of action. However, research can only be undertaken by students who are aptly qualified in their professional areas. Being qualified and working are fundamental in facilitating research avenues. It is difficult to understand how a student who has just finished a qualification at university can then go straight into a research program without first gaining valuable experience in the work force. This experience is the basis of the research.

Universities seem to be more focused on research and the financial and prestige standing in the world than on the basic premise for educating students in relevant professions and making them work ready when they have finalised their studies.

It should be emphasised from the beginning that surveying (geomatics) encompasses a wide range of qualifications, not just cadastral and therefore the courses taught need to take these qualifications into account when designing course structure and practical work.

This paper is designed to investigate the issues behind teaching practices and study units at universities and determining if the qualifications are fit for sending students into the available work force. Those employing graduates do not want to be spending time training them in basics which should have been covered in a university course.

In preparing this paper, various qualifications have been assessed from different tertiary institutions including universities and TAFE (Technical and further Education). It needs to be mentioned that TAFE has a significant number of students, some of whom use the diploma to migrate to universities to gain further qualifications.

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1. What is a Qualification

To understand study in the tertiary arena it is important to understand what a qualification is. It is not just a piece of paper that a student is given at the end of a course. It is an acknowledgement that a student has **successfully completed** all the requirements of a particular course. That in itself should indicate that they are **competent** to undertake work in that chosen field, knowing that when going into the work force they still have a significant amount of learning to continue with. Was I competent on completing my Surveying Degree? No, I was not.

Students entering a tertiary course will want to know and understand what they are going to study and basically how long it is going to take to complete the course. Should it take 3, 4 or 5 years of concentrated study to complete? The author believes that it should take the minimum amount of time and involve subjects which are relevant to the qualification. It should not introduce irrelevant material which is a distraction from the main task. In some 5 year courses these are known as “**breadth subjects**”, in no way related to the final qualification.

A number of professions demand courses longer than 4 years, such as medicine, but there are other courses that should be shorter and more focused on the educational and profession outcomes. For example the Surveyor General of Victoria has gone through a review of the cadastral licensing process in order to reduce the time surveyors are taking to obtain a license to practice. In one review session comprising licensed surveyors and review personnel, the comment was made that it would be possible to teach students the fundamentals of cadastral surveying in 2 to 3 years. Brave statement but possible to achieve!

Some universities have moved away from focusing on certain aspects of surveying and are delivering a wide stream of subjects that may cover the wider spectrum of surveying professions. Areas such as Hydrography and Spatial Sciences, are gaining more airplay than they may have previously done.

In Appendix A subjects are listed from a student who has completed an undergraduate course as well as a Masters Course at the University of Melbourne. Spot the subjects that have no real benefit to the course in terms of surveying. This student does have a desire to become a licensed surveyor.

Seven subjects have been highlighted in yellow as not being related to surveying. Depending on the length of these subjects they might constitute either a full semester or worse, a full years load. For what value and should they constitute part of the final qualification? Subjects in bold specifically relate to cadastral surveying but are optional subjects so it is possible to complete this qualification without these subjects. This may mean that these students are not work ready

on completion of the qualification, which means employers will bypass them in search of those who have these subjects.

A comment was made by a senior staff member in relation to breadth subjects, and I quote

“The subjects you are listing are “breadth subjects” – a characteristic of the “Melbourne Model”. We neither can force students to take reasonable breadth subjects (other than appealing to their common sense), nor can we offer engineering subjects in breadth slots – they have to be from outside of science / engineering / design.”

Thus it is very frustrating for students and staff to understand why a course is taking longer than it should to complete. The author is currently teaching Rural Land Development and it is shameful that those students taking it are not capable of undertaking one of the assignments as they do not have the necessary skill set to complete it. Who should accept responsibility for this?

Appendix B shows another university in Melbourne and its program structure for the Bachelor of Surveying (Honours). It is a four year course consisting of 8 subjects for each year. You be the judge on why this university has more students.

The subjects and whole structure is focused on the study of surveying and allied professions and as such provides a wholistic view of a qualification on surveying. This then produces graduates who are work ready or as near to be being work ready as possible. They are in a better position to decide on which area of surveying they may wish to follow.

The author also teaches in the TAFE (Training and Further Education) sector where students can obtain a qualification in Certificate III, Certificate IV and Diploma in Surveying. These qualifications are aimed at students who need to work and study at the same time. Most of the learning is online with two one week onsite survey camps per year. As most of the students are working in industry this is a successful way of gaining the qualification. The diploma also allows students to progress to a university course if they have a desire to continue.

2. Basic content: The ins and outs

The importance of qualifications depends on the content of the courses being offered and what might be considered valuable and not so valuable.

The comments made here are based on experience and a personal interest in training in the surveying sector. So some may say it is a biased viewpoint and they may be correct, although training has only been a part of my surveying journey for the last 15 years out of a 50 year career. And it is about giving back what has been valuable.

As has been mentioned in the introduction there are basic requirements when starting a course, and that will depend on the course undertaken. In surveying it is essential that students understand the equipment they will need to use to gather information and then have the skills to present it. Sounds simple, but not always understood by those structuring courses, who may have the idea that these are not important from a course content perspective.

In **Appendix A** it was shown in bold what subjects purely related to cadastral surveying here in Victoria. I have no issue with that or indeed the content, although these particular ones could be covered in more detail over two semesters. However, each requires particular skills to undertake and complete the course assignments, yet these skills have to be learnt elsewhere. Areas such as the basic use of instruments for capturing information and the use of computing packages such as Liscad and drawing packages such as AutoCad are skills that have to be taught during valuable teaching time.

Teaching time is considered to be about the theory of the subject, such as laws and regulations, restrictions, etc, so that students have a good understanding of what they might need to do in practical sessions. Assignment tutorials are about completing the work required to successfully complete the said assignment. Having to teach basic skills such as instrument training and drawing packages takes untold time and impacts on the quality of the assignments and the students understanding of the task.

If this is the approach to be undertaken than it should almost be compulsory that students undertake a basic Certificate III/ IV course at TAFE to obtain these skills in readiness for university. It is clear from teaching in the TAFE sector and engaging with students working in the surveying sector that they have either learnt basic skills themselves or been instructed on the job. Either way they are able to complete assignments as part of the course.

Teaching time is a valuable resource because in some cases universities and TAFE are relying on professional surveyors to deliver subjects either face to face or online or both. If these professionals are working in their own practices, then they are taking time out to teach. This is not a complaint against teaching but a sign that teaching colleges are not being funded correctly or have other priorities.

3. Research

Research is one of the many roles that universities undertake in a wide range of applications. There is no denying that research is fundamental and an important part in society understanding further development in many aspects of learning and living. The recent Covid 19 pandemic was a key moment in the importance of research and development of vaccines. This most likely indicated the value of crisis management in its best form.

However, research can also be best placed when candidates have experienced their role in the world outside of the protection of a learning environment. Gaining firsthand experience is fundamental to furthering your education in a profession that is basically a hands on one.

In the Surveying and Spatial arena, GNSS research is a top priority and even in its short life has improved many areas of the profession of surveying. But I wonder how many PhD candidates have actually worked in the field with GNSS and experienced the frustrations of users firsthand. Practical experience is fundamental to understanding what really happens. The same can be said of using instruments, particularly as new ones are coming on the market almost daily.

The head of the surveying department at the University of Southern Queensland said in a seminar in 2022, that research was required to reach 50% of its budget by a certain time. It will not get there unless students in the various courses are instructed correctly in all areas of surveying and emphasised the importance of getting practical experience.

You only need read the many journals that surveyors write in to see what research they have been doing in their day to day working lives. Research on soils and soil movement affecting the heighting of benchmarks for levelling may not have led to many PhD theses, but this onsite research has allowed many others in the field to understand what happens with various soil types and mark movement.

Thus research is important but it is not the ultimate quest for a university department. Quality of education is above this and needs to be addressed and funded accordingly. Each university or tertiary institution will be different in their approach to teaching and research and it is important to respect that. However, it may mean a potential student will seek out a university that best suits their needs in the short term in gaining a qualification.

4. Finally

Have I achieved all that I set out in the Abstract at the beginning of this paper? After all this is a paper based on my own research, investigations, talking to students and other surveying professionals and discussing with other people from other professions. It has involved some discussions with academic staff and those presenting at seminars. Do I have a biased view of academia or am I very concerned about the future of education particularly in the area of surveying and allied professions?

The aim of the paper was to tell it as I have seen it over many years of teaching in a number of sectors. In addition I have seen people in this profession who are not competent in the workplace and this may have led to unhealthy outcomes for the person as well as clients.

If I were Prime Minister or President of a country, education would be my number one priority as it can lead to much better outcomes for people. Without education, some people miss out on a whole range of opportunities that other might experience and they may struggle their entire lives.

Getting the right and useful education for the surveying profession is essential so that surveyors can make correct and mature decisions which ultimately affect clients and their land. Without

this right education and subsequent learning, mistakes are made which might have catastrophic consequences for all involved.

As this conference covers a significant area of operation by a wide range of professionals in a similar industry, this is an opportunity to discuss education of the profession at the grassroots level in the hope that ongoing improvement can be made in educating the surveyors of the future.

I am happy to discuss this further with fellow professionals, either in person or via email. I am not involved in any social media.

Appendix A

Bachelor of Design

Year	Code	Title
2017	ABPL10004	Global Foundations of Design
	ABPL20035	Cities: From Local to Global
	ENVS10006	Mapping Environments
	FOOD10001	Beer Styles and Sensory Analysis
	ABPL20036	Environmental Building Systems
	EDUC10051	Sports Coaching: Theory and Practice
	FINA10040	Graphic Design Studio 1: Image & Text
PLAN10002	Introduction to Urban Planning	
2018	ARCH20003	Modern Architecture: MoMo to PoMo
	FREN10004	French 1
	GEOM20013	Applications of GIS
	GEOM30009	Imaging the Environment
	CCDP20001	Street Art
	GEOM20015	Surveying and Mapping
	GEOM30013	Land Administration Systems
MAST10005	Calculus 1	
2019	COMP20005	Engineering Computation
	MAST10007	Linear Algebra
	COMP20005	Engineering Computation
	MUSI20150	Music and Health
2020	CVEN30008	Engineering Risk Analysis
	PLAN30004	Transit Oriented Development
	MUSI20163	Samba Band
	CVEN30011	Smart Transportation
	GEOM30012	Integrated Spatial Systems

Master of Engineering

Year	Code	Title
Credit Granted for Studies at the University of Melbourne		
	ABPL20036	Environmental Building Systems
	COMP20005	Engineering Computation
	CVEN30008	Engineering Risk Analysis
	GEOM20013	Applications of GIS
	GEOM20015	Surveying and Mapping
	GEOM30009	Imaging the Environment

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	GEOM30012	Integrated Spatial Systems
	GEOM30013	Land Administration Systems
2021	ABPL90041	Property Law (PG)
	GEOM90008	Foundations of Spatial Information
	GEOM90038	Advanced Imaging
	GEOM90045	Residential Land Development
	ENGR90021	Critical Communication for Engineers
	GEOM90033	Satellite Positioning Systems
	GEOM90040	Mathematics of Spatial Information
2022	GEOM90018	Spatial Databases
	GEOM90041	Cadastral Surveying
	MGMT90140	Management Competencies
	GEOM90015	Spatial Data Infrastructure
	CVEN90045	Engineering Project Implementation
	GEOM90006	Spatial Analysis

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Appendix B

Year One of Program

Course Title	Code
Mathematics for Surveying and Geomatics A	MATH2163
Surveying Fundamentals	GEOM2088
Scientific Skills and Communication	ONPS2334
Cartography 1	GEOM2077
Spatial Information Science Fundamentals	GEOM1033
Applied Geospatial Techniques	GEOM2083
Surveying Computations and Drafting	GEOM2089
The Changing Environment	ENVI1146

Year Two of Program

Course Title	Course Code
Mathematics for Surveying and Geomatics B	MATH2164
Physics of Satellite Measurement	PHYS2088
Mapping Your World	GEOM2079
Terrestrial Surveying	GEOM2091
Spatial Information Science Principles	GEOM1044
Statistics and Measurement Analysis	GEOM2162
Surveying Programming	PHYS1080

Year Three of Program

Complete the following Eight (8) Courses:

Course Title	Code
Cadastral Surveying Practice	GEOM2101
GNSS Surveying	GEOM2093
Cadastral Surveying Law	GEOM2102
Geodesy and Satellite Navigation Systems	GEOM2119
Research Procedures	GEOM2124
Planning and Environmental Regulation	ARCH1059
Earth Observation Science	GEOM2084
Geospatial Science Project 1	GEOM2163

Year Four of Program

Complete the following Seven (7) Courses:

Course Title	Course Code
Advanced Imaging Technology	GEOM2086
Geospatial Science Project 2	GEOM2164
Capstone Research (Design)	GEOM2114

**Engineering and Construction Surveying
Survey Network Design and Analysis
Professional Practice**

Capstone Research (Implementation)

AND

Select and Complete One (1) Course from any:

University Elective

**GEOM1060
GEOM2121
GEOM2116
GEOM2115**

AND

Program Options

Program Options List:

Course Title

Geospatial Programming
Accounting in Organisations and Society
Business Advisory Services
Digital Business Design and Innovation
Database Concepts
Approved External Program Option
Global Surveying and Geospatial Experience
Introduction to Programming
Project Management Concepts
Resource Management
Sustainable Futures
Property Economics
Alternative Dispute Resolution
Unmanned Aerial System Operations

Course Code

GEOM2159
ACCT1046
ACCT1022
ISYS1051
ISYS1057
EXTL1195
GEOM2154
COSC1519
BUSM3307
ENV11098
ENV1153
BUIL1149
HWSS1144
AERO2481

BIOGRAPHICAL NOTES

Paul F Kenny

Bach. Surveying (Melb)

Licensed Surveyor

Grad Diploma in GIS & Remote Sensing (Charles Sturt)

Certificate IV in Workplace Training and Assessment.

Current part time teacher in surveying in TAFE NSW

Currently teaching Residential Land Development at Melbourne University

Spent 38 years working in the Victorian water industry until 2012.

Currently operate a sole surveying practice in rural Victoria Australia.

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