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Journal of a young leader in public works – A progressive pathway

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ABSTRACT:

My development to becoming an Engineer was far from direct. In 2008 I held a bachelor's degree in business administration and had a career in real estate, I knew this was not my calling. Answering an advertisement in the local paper I secured a traineeship in civil engineering design that started me on my pathway to become an Engineer.

The next decade was a stressful but rewarding journey which involved working full time, studying part time, and dealing with the trials that life brings. Whilst undertaking my Diploma of Civil Construction Design I became a father for the first time in 2010. In 2011 I graduated with distinction and was awarded the NSW State Medal for achieving the highest average mark in the state. At this point I knew I had found my calling.

In 2012 my wife and I made a commitment that I would continue to study, and I commenced a Bachelor of Engineering Technology at UNE. Shortly after commencing I lost my father because of suicide. This was a low point in my life. I pressed on and in 2013 started a new role as Cadet Civil Engineer and was involved in the project management of the $4.6 million revitalisation of the Narooma Streetscape. I also welcomed the birth of our second child. At this time my wife developed a serious medical condition causing seizures which we will need to manage for the rest of her life. Council's support network was invaluable during these times.

I secured a permanent position as Engineering Design Officer in 2014 and transferred to USQ where I completed a Bachelor of Engineering (Civil) Honours degree and was awarded the University Medal upon graduation (2018). I have worked on many challenging infrastructure projects and last year I was awarded the David Abbot Young Public Works Leader of the Year (2018).

KEYWORDS: young leader, progressive pathway, non-traditional engineering student, public works engineering.

1 Introduction

Historically, the route to becoming an engineer meant that you went to university immediately after finishing high school, often with little work or life experience. After completing your studies, you would then start your career as a graduate engineer and lead teams of highly skilled and experienced people on tasks that you had often only ever read in a textbook. This would then begin a very steep learning curve and you would either "sink or swim".

There is nothing innately wrong about the traditional pathway to becoming an engineer, it has worked successfully for hundreds of years. However, just like the engineering profession has adapted to a changing environment so to are the pathways to becoming an engineer. This is vital given the shortage of qualified professionals in the Science, Technology, Engineering, and Mathematics (STEM) fields as discussed by Penesis et al [1]. Also, it has been stated by Irvine et al [2] that in Australia the Civil Construction industry is reporting that graduates often lack the practical skills to successfully undertake their roles on complex construction projects. Although there are many challenges for 'non-traditional' students, in a recent study Chung et al [3] found that students who identified as non-traditional in terms of age, employment or parenting responsibility had higher levels of resilience than those who identified as traditional students. These graduates often also have added life experience and practical skills which they can apply to their profession.

My journey to becoming an engineer provides a real-life example of a non-traditional pathway and highlights some of the challenges and

benefits that I have encountered along the way with working full time in the public infrastructure sector whilst studying via distance education and supporting a family.

2 A progressive pathway

2.1 Early years

Growing up I had an almost idyllic Australian childhood, but like many others I had a few obstacles to overcome. From an early age I struggled academically. This was initially due to a significant speech impediment that I had developed in early primary school that made it difficult for other students or teachers to understand me and required me to repeat kindergarten. I had to work hard to keep up in English based subjects throughout school. Although I have largely overcome these difficulties, to this day I still need to consciously work on my communication.

To begin with, I also found mathematics difficult. However, in year two a light bulb clicked and for me I fell in love with maths. Maths makes sense, maths is right or wrong. The numbers aren't dependant on the authors tone or available for interpretation.

2.2 Life before engineering

Growing up I had a dream of being an engineer in the army. While finishing High School I worked part time in my parent's real estate business and planned to commence a career in the defence force once I had finished. However, after completing my High School Certificate and going to the ADFA orientation day and realised I was not ready to make such a life changing commitment at this age. Instead, I decided to help my parents run and manage the real estate agency. Whilst working full time with my parents I also enrolled in the local Batemans Bay campus of the University of Wollongong (UOW) and undertook a Bachelor of Business Administration. It was on my first day of these studies that I met my future wife Melissa. Following university, we married, and Melissa also began working in our family business which is still thriving to this day.

2.3 Career change

In 2008 the local real estate market was experiencing a downturn. During this time, I realised the risk in having all our commercial interests tied up in the one organisation. I also had my desk wedged between my wife's and my mothers and found it was impossible to please both at the same time. I decided at that point to revisit the childhood dream of becoming an engineer. My wife and I explored the possibility of me going back to university to study engineering but the return to study would have meant a huge upheaval to our life and a move to a city at least 4 hours away. An ad in the local paper for a trainee position for a civil engineering design officer at the local council seemed the answer. After going through a rigorous recruitment process against numerous other applicants I came out successful and began my new career.

2.3 Working at Eurobodalla Shire Council

The design traineeship at Eurobodalla Shire Council (ESC) was excellent. I started with another trainee and we were each allocated experienced design officers as our mentors on a rotating basis. Each mentor had their own specialisations and this model allowed me to reflect on different methods of doing things and adapt those that I found worked best. The work started at a basic level where I was designing pathways, driveways, emergency evacuations plans and carparks but became increasingly more complex as I developed. However, each day no matter what project I was working on I came home buzzing and proud of the contributions I was making to shaping my community. So much that I think my friends and family became sick of me talking about how much I loved my job.

The formal study component of the traineeship involved undertaking a Diploma of Civil Construction Design through the Riverina Institute of TAFE NSW. At the time this same TAFE was involved with assisting with in-house certificate III and IV training for our construction supervisors and assistant supervisors. The diploma model, however, involved a mixture of distance, block release and on the job/project learning. I found this mix of delivery was perfect. ESC was also extremely helped with this by tailoring the work that I was undertaking, where possible, to that with which I was studying. For instance, when doing the surveying units, I was sent out with Council surveyors to assist with detail surveys. When doing the materials subjects I was paired up with Council's Geotechnician to undertake pavement designs and when we

were studying specific design modules we were given similar projects to work on. Importantly, the final year of the diploma involved a major project. I was grateful to be given a million-dollar rural road design at Burri Road, Malua Bay to work on from concept to completion. ESC also encouraged and supported me to be regularly involved during the construction phase.

The project-based learning really cemented the concepts at which had been presented at TAFE. Not all my fellow TAFE students were lucky enough to work full time in the engineering profession whilst undertaking their studies and you could certainly notice the difference between the students. It was evident to me that those who also had full time work in the same industry did much better with their TAFE studies. In 2011 I graduated this Diploma with distinction and I was very honoured to also be awarded the TAFE NSW State Medal for achieving the highest average mark in NSW for this qualification. Along with my own hard work and dedication I certainly could not have achieved this without the ongoing commitment and assistance of my fellow mentors at such a supportive workplace.

After completing the Diploma, I knew engineering was my calling. In the remaining year of my traineeship I took the initiative to commence a Bachelor of Engineering Technology to further my career. In 2013 I then secured a temporary position as Cadet Civil Engineer based at ESC's works depot.

As Cadet Civil Engineer, I worked alongside Council's experienced Project Engineer, Russell Burke, primarily on the project management of the $4.6 million revitalisation of the Narooma Streetscape. This was a very rewarding and challenging project for which I was heavily involved with for over two years in all facets from project planning and community consultation through to the detailed civil, electrical and landscaping design and then significantly throughout the construction phase. The project included the construction of a new roundabout, improved intersection treatments, new carparks, upgrades to the Princes Highway and underground services. It also included landscape and streetscape works that transformed the area with the planting of over 100 new native trees, 12,000 native shrubs, park areas and a playground to encourage visitors to stop, rest, enjoy the natural beauty of the town and to invest in the local economy. I liaised directly with Council's designers, consultants, contractors, works crews, management, Councillors and key stakeholders on a regular basis to ensure the project was delivered for the Narooma community.

Towards the end of the Narooma Streetscape Project I was given the opportunity to present the project at our regional IPWEA conference held in Narooma, the IPWEA NSW Works Officers Conference and the IPWEA NSW State Conference. It was a privilege to be able to showcase how we had revitalised the Town Flat Area of Narooma and to demonstrate the significant road safety improvements ESC had produced.

In 2014 a permanent position as a Design Officer at ESC became available. Given my love of engineering design I took on the role whilst continuing with my engineering studies.

As an Engineering Design Officer, I have been able to really adapt what I have learnt at university and from my time in project management and construction into practice. This experience has enabled me to successfully complete many challenging design projects with confidence including the design of urban and rural roads, car parks, pathways, streetscape upgrades, stormwater upgrades, retention basins, intersection treatments, roundabouts, and other key public infrastructure. These projects have enabled Council to deliver substantial improvements to our community.

During my time as a Design Officer I have also undertaken a variety of courses in civil road design, stormwater design, road safety and leadership. I enjoy motivating those around me to achieve the best outcomes for the community. I have also been successfully involved in leadership and mentoring of other staff. After representing ESC at the Rural Management Challenge, I was chosen as a mentor to ESC's Unearthing Leaders Program in 2017 and again this year to help develop the leadership skills of the participants and transfer some of the insights and experience that I have picked up along the way. I have also successfully mentored other trainee design officers and Cadet Engineers who have ultimately become very productive colleagues that I now work alongside, I look forward to continuing this mentoring role.

At ESC I have worked consistently to develop long lasting relationship across Council departments, with other organisations and suppliers and with key stakeholders within the community. Many of my colleagues have now become close friends for which we support each other both in and outside of work.

2.4 Fatherhood

In 2010 I became a father for the first time with the birth of our son, Shaun. I was taken by surprise at just how much you could love someone from the second they came into my life. However, my wife suffered a traumatic birth injury which would end up having lifelong complications. In 2012, my wife became pregnant with our second child, Charlotte. This was truly a miracle as Melissa was undergoing a medical trial at the time when she discovered she was pregnant. Charlotte was born in 2013 and has completed our family.

Fatherhood is amazing and life changing. However, it is not easy. Full stop. No need to include work or study into that. Suddenly, you are responsible for another human being. One child working full time and studying was difficult, two children under three is a whole other ball game. As a working parent you really need to prioritise, plan and make the best use out of every minute of time available.

My kids have taught me perspective and what is important in life. I live in a beautiful part of the world on the South Coast of NSW. Working in a career where you can shape your community for the better is fulfilling. Having a workplace that gives you the time to enjoy it with a healthy work/life balance is invaluable.

2.5 Losing my father to suicide

On the 21st June 2012 I lost my father, Fred, to suicide. He had lived with the autoimmune disease, lupus, which essentially causes the body to attack itself. One of the major symptoms of this disease was severe depression. In the year before his death he had separated with my mother and was going through a difficult period. On the day of his death I had an urge to call him on the way to work. However, I put this off given my busy schedule believing I would touch base with him that night when I had more time to talk. Unfortunately, at work that day I received the news that he had passed away because of suicide and I never got the chance to make that call.

After his death I went through a particularly difficult period. My initial way of coping with this was to internalise the pain and throw myself into work and study. However, during this time ESC and my close colleagues were very supportive. Through Council's Employee Assistance Scheme, ESC organised counselling sessions for me to help come to terms with my grief. I had blamed myself for a long time wishing I could have done something differently. However, with the support of my family, friends and colleagues, and the perspective that comes with time, I realised this way of thinking was not healthy. I have come to accept that my father's decisions were his own and were a side affect of his illness. I have learnt from this not to disconnect with those around you, maintain a close support network and to seek help when you need it.

2.5 Taking engineering to the next step

After completing my Diploma, I decided I wanted to take engineering to the next step an become a fully qualified Engineer. However, as it was imperative that I continue working full time to support my family, I knew this was a big commitment and would mean almost 8 years of part time study. At 27 this meant I would not be finished until I was at least 35 and I would also loose out on countless hours of time spent with family and friends. Nevertheless, the alternative was to do nothing and always regret not taking the leap.

In 2012, with my families' and work support, I made the call to enrol at the University of New England (UNE) in a Bachelor of Engineering Technology. UNE had an articulation agreement with the University of Southern Queensland (USQ) where you could then go on to complete your 'final year' (full time equivalent) at USQ and finish with a Bachelor of Engineering (Honours) degree. Both degrees could be completed via a combination of distance education, online learning and on-campus short stay residential schools.

At the university level, many of the units were in the same subject areas as those that I had completed at TAFE. However, the subjects were much more in depth and focussed more on the theory behind some of the practical aspects of the Diploma. Having a thorough understanding of both really completed my knowledge and enabled me to really put into practice what I was learning.

Midway through my degree at UNE I was excelling with all my grades at the High Distinction or Distinction level. I was also awarded the UNE Vice Chancellor's Scholar award in both 2013 and 2014 for my excellence in academic performance along with various academic merit awards for specific subjects. I had an absolute love for what I was studying. Consequently, UNE even offered me an opportunity to undertake post-

graduate research once I finished my degree. However, at this time I realised I was not getting any younger and I needed to complete my studies as efficiently as possible. I also knew I didn't want to pursue an academic career. At the same time the class sizes at UNE were significantly declining. At this point I decided to be proactive and contact USQ to ensure I was undertaking the right electives to articulate the Honours degree. USQ advised me that several of the subjects within the UNE degree were not directly transferrable and that I would need to repeat some subjects. As a result, if I had continued with UNE it would have taken me extra time to become qualified. However, by transferring to USQ early I was able to shave a full year part time off the degree compared with the alternative pathway. Consequently, I made the shift to USQ.

By taking advantage of cheap air travel between capital cities, the trip to USQ was both quicker and cheaper. It also suited my situation better with the course delivery being broken up with academic subjects completed online and practical subjects being delivered on campus. These subjects did not need to be completed simultaneously which allowed me to really maximise my trips to Tooowomba.

I predominately received High Distinctions at USQ finishing with a GPA of 6.95/7. This included being awarded a High Distinction for my Thesis on the Network Management of Low Volume Roads in NSW, something which affects many regional councils.

After lots of hard work and sleepless nights I graduated in April this year from USQ with a Bachelor of Engineering (Honours) First Class majoring in Civil. I was also awarded the University Medal, USQ's most prestigious academic award. It was great to complete this chapter of my life and celebrate with friends, family and colleagues.

Figure 1: Graduation Day at USQ

I attribute much of the success in my academic endeavours to the experiences I had endured both prior to and whilst studying. I found having prior applied knowledge in the engineering field and ongoing real life work experience made grasping the often complex theoretical concepts easier.

In addition, in 2018, I was named joint recipient of the David Abbot Young Public Works Leader of the Year at the IPWEA NSW State Conference. This award recognised my academic achievement and contribution to public works. It was certainly an honour to be recognised with such an award.

Figure 2: IPWEA NSW State Conference – David Abbot Award 2019

2.7 Life's ongoing challenges and importance of a strong support network

Following the birth of our son in 2010 my wife Melissa was diagnosed with pudendal neuralgia resulting from a traumatic birth injury. Melissa has had a dozen surgeries and countless other minor procedures to treat her ongoing symptoms. Apart from issues related to pelvic floor weakness Melissa suffers from daily seizures where she is unable to control her body from chronic pain. This condition defines much of our family life.

Melissa has had her drivers license suspended due to the seizures and is unable to attend to most activities that she used to enjoy independently. To help with this, in 2018 we built a second house on our property for my mum to live with us to help care for Melissa. This has enabled Melissa to maintain as much of her previous life as possible and continue to work part time.

My past experiences with grief have highlighted the need for our family to remain connected and talk through the issues as they arise. Communication is really the key. Melissa and I are undergoing continued therapy in

dealing with this lifelong issue. Despite this we still live an amazing and fulfilling life. Throughout this experience ESC has been incredibly supportive. These challenges just allow us to focus on what is important in life.

2.8 What's next

To stay ahead and keep up with an ever-changing environment, ongoing professional development never finishes. This year I am very privileged to present this paper at the IPWEA International Public Works Conference. At this conference I hope to learn much from other very successful engineers and public works leaders. In addition, this year I have co-authored a paper with Dr David Thorpe (USQ) titled "Sustainable Development and Management of Low Volume Road Networks in Australia". This paper is being presented at the International SEEDS (Sustainable Ecological Engineering Design for Society) Conference at Leeds Becket University, UK in September. This paper is based on my university thesis.

I also continue to develop my skills both on the job and through short courses. In August 2019 I am starting a Professional Certificate in Asset Management Planning with IPWEA. I hope to continue to develop my career and one day become a Divisional Manager at ESC.

3 Conclusions and recommendations

My pathway shows that the traditional route to becoming an engineer is not the only way. My journey demonstrates that having prior work and life experience, particularly within the engineering field is a great advantage to graduates. Like other people, I have encountered several challenges along my journey. However, with dedication, hard work and a robust support network I have overcome these and grown even stronger. Although my pathway has been far from a direct route, I would not change any the choices I have made. Everything I have experienced and learnt up until today has made me a well-rounded engineer, leader, husband, father and person.

All my success in public works can be credited back to the opportunity ESC originally gave me. I encourage all councils and public works organisations to support engineering traineeships and cadetships wherever possible. Our profession would be much weaker without them.

If there is one thing to be taken from my presentation, do not let past decisions limit your future. As an engineer we know there is always more than one solution to a problem. Instead, draw on your past experiences turning them into a competitive advantage.

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