

# A BEGINNERS GUIDE TO INCORPORATING ABORIGINAL PERSPECTIVES INTO ENGINEERING CURRICULA

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*“This unresolved aspect of Australian history resonates through so much of the engineering industry. A strong sense of distrust, apprehension and misunderstanding exists between so many Aboriginal communities and the engineering industry and at the heart of it all is Country”*

## YOU'RE ON COUNTRY

As a matter of fact you're on Country every day, everywhere you go... It's the same place you send students to study, explore and examine, as you yourself may have done as a student, to give them practical application for their engineering learning. From an Aboriginal perspective, the point is, wherever you are at this very moment, you're on Country.

What does this actually mean to you?

You see, the Engineering Industry in Australia today is fraught with legislative, financial and social pressures whenever it attempts to manage areas involving;

- Aboriginal Australia
- Aboriginal culture
- Aboriginal cultural heritage
- Aboriginal engagement
- Aboriginal participation
- Aboriginal employment
- Aboriginal consultation

And the list continues...

Examples such as the Carmichael Coal Mine and Abbot Point Port Expansion<sup>1</sup>, the Pacific Highway road works at Bulahdelah<sup>2,3</sup> or the residential development at Sandon

Point in the Illawarra<sup>4</sup>, show that engineering projects that include practically anything Aboriginal result in complicated scenarios that spill out into social and political arenas like those of the reconciliation movements or of Aboriginal communities advocating political and cultural activism. This is the reality for engineering in Australia today.

This will at some point be of direct concern for you, or for your students. Yet the fact is, that engineering education in Australia is all too rarely educating student engineers for this reality. The problem is therefore not a difficult one to articulate – however hard it is to redress. Engineering students who are not adequately prepared in regard to identifying, negotiating, managing and resolving problems involving Aboriginal issues, are entering the Australian engineering industry underprepared, and unaware of the challenges they may face. This will have the potential for an increasing array of problems in regards to successful management of projects requiring consideration of Aboriginal matters. This can have counterproductive impacts on the industry, and thereafter, on already fragile social relations.

Some may realise this as the sad paradox it is: Australia's engineering history has contributed enormously to vast physical impacts on **Country - Aboriginal peoples' most sacred entity**. Meanwhile, Australian Engineering education is one of the last disciplines to adopt any form of instruction on



matters pertaining to the land's original Custodians.

The current environment highlights an ever increasing need to educate engineering students about Aboriginal perspectives, which need to be embedded within standard engineering curricula. This need is increasingly apparent with changes in legislation, and law reforms requiring protection of Aboriginal Culture and Heritage in development projects<sup>5,6</sup>, and the growing societal pressure to acknowledge Aboriginal and Torres Strait Islander people within the constitution.

This unresolved aspect of Australian history resonates through so much of the engineering industry. A strong sense of distrust, apprehension and misunderstanding exists between so many Aboriginal communities and the engineering industry and at the heart of it all is Country. Motivations within governments, broader society and Aboriginal communities across the nation are encouraging greater engagement between Aboriginal Australia and the Engineering industry, escalating the need for engineering education to respond. Conversations need to be held, dialogue begun and relationships built, so that a better education of our future engineers can be provided, and to enable the discipline of Engineering to earn respect

for its contributions to the longevity of our shared 'Country'.

We trust that these guidelines motivate you.

We found that incorporating Aboriginal perspectives into Engineering curricula is a practical and achievable way of instigating crucial changes. Embedding relevant content and providing engaging experiences in a manner that provides Engineering students with access to authentic Aboriginal knowledge allows them to develop essential attributes and knowledge for newly practicing engineers. These will be increasingly important in the future as social changes bring greater awareness about Aboriginal Australia.

However, the process is not easy nor straight forward. It requires time, effort and – of course – money. It is the time and effort that are both demanding and rewarding.

*A hard road lies before you, but it is a vitally important one for the future of Australia. Lots of Australians are already walking it, and if not ... they will be walking it sooner or later.*

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## OUR STORY

Our story is multi-layered, multi-faceted and multi-relational. Our hope is that in sharing our story from its creation to now, you will gain the understanding necessary to build and maintain your own relationships with your own Aboriginal communities and key Aboriginal people local to your country to help you achieve the embedding of Aboriginal perspectives into your engineering curricula.

We undertook this journey based on the award of an Office for Learning and Teaching Grant entitled Integrating Indigenous student support through Indigenous perspectives embedded in engineering

curricula. The proposal was clear and succinct, with identified outcomes and known stages.

As we entered into the journey we became less certain just how to approach the task of respectfully embedding Indigenous perspectives. We have had the highs and the lows that go with any such journey, and feel privileged for all the moments of overwhelming complexity, brief flashes of enlightenment, and instances of absolute epiphany that have led to the achievement of real progress and deepening relationships.

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## OUR TEAM

We are a motley crew, drawn together by an interest in sharing different perspectives and improving the quality of engineering education. We are learners, not preachers. These guidelines share our learning

with you, in the hope that you may see familiar themes and find parallels with your own contexts and experiences. It is a continuing story – and this is one, important, chapter along the way.

## JADE KENNEDY

I always find writing about myself a painful exercise. It's much more my way to sit and talk, outside, where time can escape us and conversations of who we are and where we're from organically form a bubble of connections that block out the apparent demands awaiting, as we weave a shared understanding of why we are sharing time. I'm first and foremost Yuin. I belong to the South Coast of NSW. I am a father and a son, I am a brother and an uncle, I am a cousin and a Countryman and it is these intimate relationships

up and down the coast that provide me the privilege of following the footsteps placed before me. I have a passion for my people and my Country, which obligates me to a journey in search of the ways to heal the sicknesses that continue to ostracize, devalue, and discriminate against my people's need to maintain balance within our ever changing environment. Engineering paves the road my journey is on, and the beginning of this journey we are sharing with you within this guide.

## TOM GOLDFINCH

I am a middle class man from a middle class family. I live in a detached house on a suburban street which I own, not far from the detached house on the suburban street I grew up in and which my parents own. I am married, I have one son, 2 cars, 3 pet fish, 4 pet chickens. I am a white male with an engineering degree and the son of a white male engineer. Complete strangers trust me to keep an eye on their luggage while they use the bathroom. People in the street ask me for directions without hesitation. Politicians fall over themselves for my vote.... I have never had to justify my place in the world, the definition of privileged.

Having had such opportunity in life, how would I understand the challenges faced by minority groups in engineering? How would I realise the impact that my way of doing things would have on others? How would I recognise my own unconscious biases? How would I exploit my opportunity to create the same for others? Having accepted my ignorance, resisted the urge to try and fix everything as I understand it, I just started listening. Exploring the perspectives of others is a deeply enlightening experience. Listening has brought new colleagues, new friendships, new ways of understanding the world, new motivations, and new purpose...

## ELYSSEBETH LEIGH

“The town where the cheese is made” is a familiar response when I reveal that Bega, NSW is my ‘home town’. I was an adult and had long since moved away, before I learned that the Bega Valley is also ‘home’ to the Yuin people who had lived and thrived there for thousands of years before my English and Irish ancestors arrived.

As an educator, with qualifications in Archaeology, History and Adult Education my roles in this story

are researcher and writer. My passion for listening closely to questions, in order to find the assumptions and beliefs behind them, led me to ask the question ‘What exactly is Aboriginal Engineering?’ and thereby contributed to making this project more complex than originally envisaged. This apparently simple question has opened up avenues for exploration and led us to develop new insights into how to engage Engineering Educators with the marvels of millennia of Aboriginal Engineering knowledge.

## JULIANA KAYA PRPIC

I was born in Switzerland. My parents were refugees, from the former Yugoslavia. We came to Australia when I was 2 years old and was officially described as a ‘displaced person’ until I became an Australian citizen at the age of 7. As a child I felt lost in the liminal realm of ‘neither-nor’. I had no access to family or culture from Croatia or Slovenia, and did not feel accepted in 1960s white Anglo-Saxon Melbourne. I have a weird unpronounceable surname, ate strange food, and used metaphors that no-one could understand.

As an avid reader, I first met Aboriginal peoples in a book about cultures of the world and remember the sepia photograph of an archetypal Aboriginal man standing on one foot with spear in hand. The Dawn of Time: Australian Aboriginal Myths (Charles Mountford and Ainslie Roberts) was a treasured award in high school, but there was no-one to help me learn about Aboriginal culture.

Those childhood experiences shaped a deep interest in bridging cultural and disciplinary divides. I began work as a microbiologist then moved into higher education. I was involved in a World Bank Project to improve teaching of science and engineering in Thailand, which helped me comprehend multiple world-view and prompted an exploration of philosophies and theories of cultural differences.

I have now come full circle and am deeply grateful to be involved in projects where I work with Aboriginal peoples and am excited to be standing at several doorways into wisdom drawing on 60,000 years of culture, building my own bridges through the intercultural littoral – a realm of ‘both-and’. I am rejoicing in acquiring an embodied and emotionally connected lived experience, so essential to relating personally in order to ‘know’.

## TIM MCCARTHY

I am Tim McCarthy and I come from far away, from Ireland. I am indigenous Irish. My family can trace its Irish roots for hundreds of years and by folklore through a millennium, through centuries of wealth, then dispossession and poverty, religious persecution and discrimination. Through the struggles of my forefathers and the growth in democracy and emancipation, my people moved from poverty to education to prosperity. The education of indigenous Irish people led to their independence and the building of a modern country. My Dad was the second generation of engineers that built his country.

I became an engineer and left that country because previous generations made me free. I broke free from the land though my education and I chose to leave to discover the world. I found here.

As a relatively new immigrant, I am conscious of being in another person's place. I am conscious of having been welcomed to this place by white and black Australians and being made feel welcome. Through my interactions, especially with Jade, I can feel the link between my Indigenous story and the Australian Indigenous story.

## LES DAWES

Growing up in the country gave me a naïve and sheltered view of the world, how it operated and how people treated and interacted with other cultures. I began work in the Resource sector in the 1980's first as a Geologist and then as an Environmental Engineer working in remote regions across Australia and overseas. I was exposed to a number of issues especially social inequality and prejudice, which made me uncomfortable and did not really understand at that time.

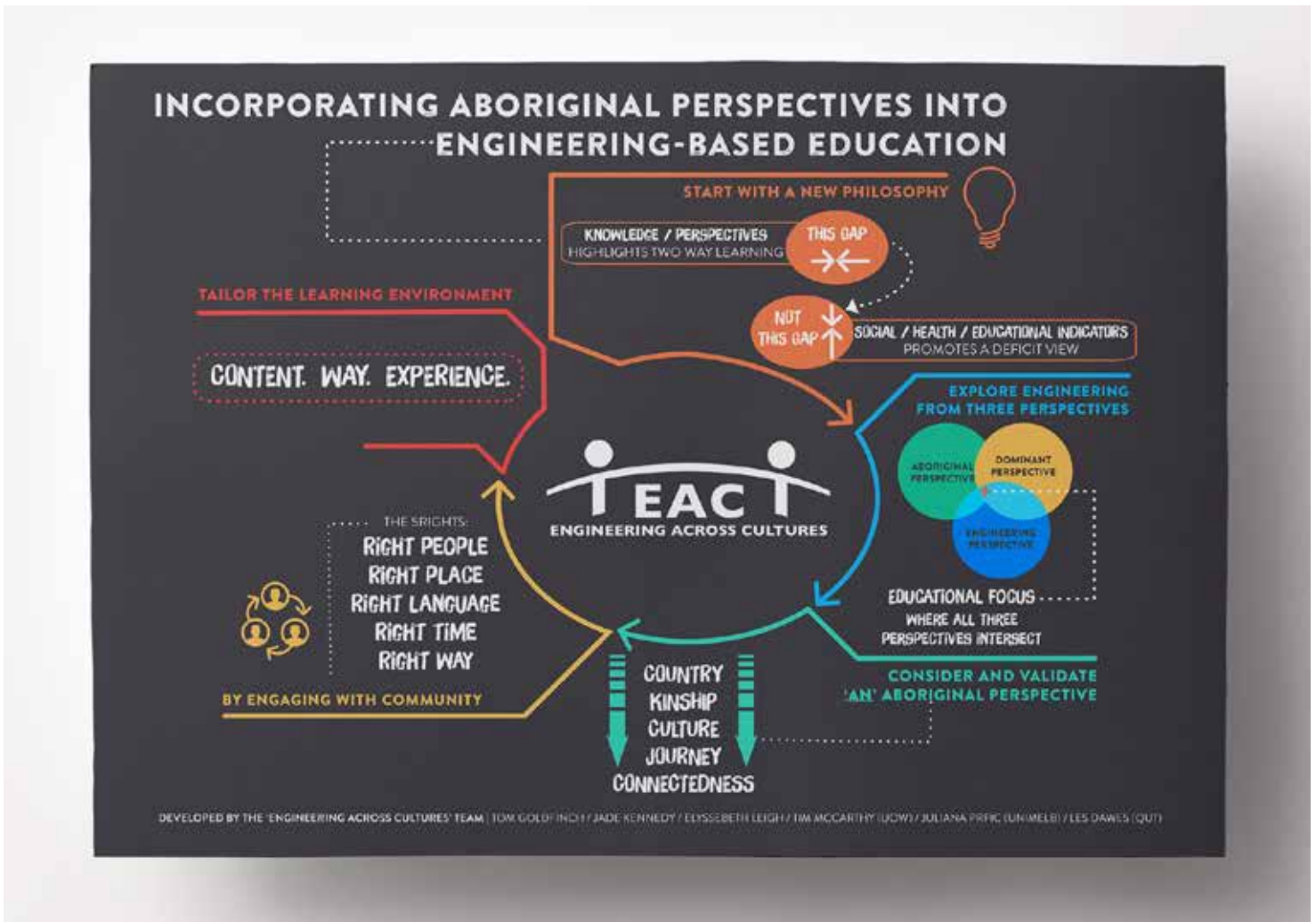
With a deep interested in understanding and working with other cultures I sought out and worked on Aid Development projects in the Pacific (Tonga, Fiji, Kiribati) and Asia (Thailand) and in remote and regional Australia. These experiences have given me a better understanding of our country and its people. I found sport a environment for breaking down barriers and allowing me to understand people, where they

came from and their cultures. I want to ensure my own children, and the engineering students I teach, all develop an awareness of other cultures and learn to respect their heritage.

I met Tom many years ago at an AAEE Conference. Our friendship grew and has involved me in two projects on cultural awareness. Through our weekly Skype-based team meetings we have become very close, keen to discuss contentious issues, and always willing to listen to different perspectives.

This has been a great learning experience for me and I intend passing on the knowledge gained to all engineering students I teach. I want to prepare them to enter the workforce with s clear of understanding what is important when interacting, and working, with indigenous communities.





## THE INFOGRAPHIC

The objective of these guidelines is to provide a set of reference points for making decisions about how to build a genuine two-way relationship with the right Aboriginal people and Aboriginal communities that will contribute relevant Aboriginal perspectives to your Engineering discipline. The path that lies before you is encapsulated in the image above

This infographic is the direct result of our collaborative journey towards establishing culturally appropriate means of embedding Aboriginal perspectives in engineering based curricula.

We developed this means of conveying our guidelines through a series of workshops, discussions, trials of new subjects for students and extensive research and exploration. The image has become a deceptively

simple means of introducing the knowledge that emerged from our experiences. Its principles provide information and advice with which anyone can begin the journey of negotiating their way through problems and difficulties. We cannot anticipate everything likely to arise along your path of learning about Aboriginal perspectives, engaging participation from Aboriginal people, and embedding Aboriginal knowledges into your own engineering curricula. In presenting these guidelines we therefore emphasise that they do not hold all the answers, many of the questions that arise will require unique solutions that you must find for yourself. The guidelines invite you to engage with, and experience, the process as a journey that will be particular to your place and community. Keep this in mind as we now travel through the details of infographic with you.

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## FIVE KEY COMPONENTS

Our journey has taken us along a path with interconnecting components each of which only gradually became evident and clear to us. In the same way that we built the image and made the connections, you can use the elements – and the pathway – to develop your own approach to integrating Aboriginal perspectives into your own work in engineering education.

The five key components are:

- Start with a new philosophy
- Explore Engineering through three perspectives
- Consider an Aboriginal worldview
- Engage with Aboriginal people and their communities
- Tailor the learning environment

As the story we share unfolds, you will find that this document can only guide you part of the way ... simply because ...

*... Your path, and your journey on Country, are always and only yours to create...*



## START WITH A NEW PHILOSOPHY

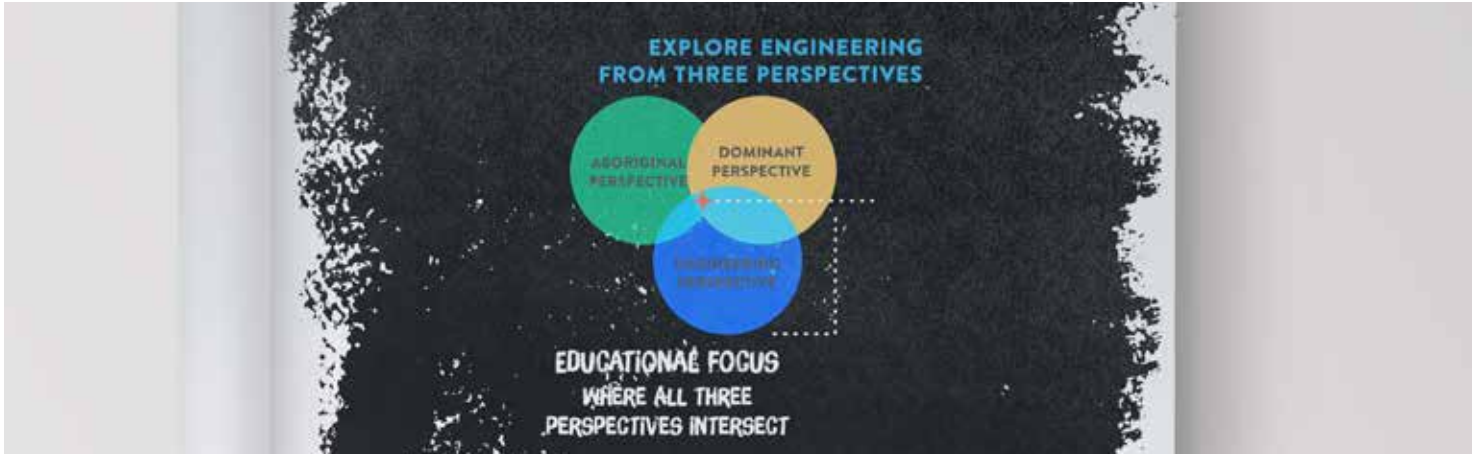
As noted in the introduction, too many government policies are based on a ‘deficit view’ of Aboriginal society and therefore aim only to address the gap in social indicators – in such matters as health, housing and education – that exist between Aboriginal and non-Aboriginal Australians. This approach has its roots in older beliefs about cultural disparity, and can lead to a top down approach to achieving parity through promoting initiatives that endeavour to give a leg up to Aboriginal Australians. The gap statistically represents a social divide within our society, that is based as much in misunderstandings about essential cultural differences, as it continues beyond this to produce an implicit perspective that all aspects of Aboriginal Australia need paternalistic support<sup>7,8</sup>.

This deficit view informs the positioning of Aboriginal people as being ‘less than’ members of the non-Aboriginal Australian population. Use of a term like ‘the gap’ not only implies that there are social issues in need of fixing, it also suggests an underlying perception of a pervasive need to save Aboriginal people from their current situation. Such perceptions entrench a deficit view of Aboriginal people as missing something – justifying policy decisions that consider Aboriginal issues warrant interventions that would not be countenanced by other groups of residents on this continent.

It is apparent that it is time to question the deficit approach, since the evidence is that the gap in social indicators is widening in some areas, not closing<sup>9-11</sup>. Methods of engagement that enable full and equal participation, without the stigma of deficiency are required. To be legitimate, such methods will be built on initiatives that engage all participants on equal terms, and not based on attitudes that position a whole people as less than other members of society.

Because this project is based in engineering education our specific propositions concern insights about what can be gained through adding Aboriginal perspectives to processes and solutions delivered by the discipline. By valuing Aboriginal perspectives, and replacing the perception of cultural inequity with a deeply respectful curiosity, it is possible to reposition Aboriginal people and their knowledges as equal with, and simultaneously different from, other cultures and knowledges. Enacting this change in stance reveals that the ‘gap’ is about knowledge of each by the other. It resides in a general ignorance of Aboriginal beliefs and values as well as a widespread lack of understanding of the practices, knowledges and principles underlying Aboriginal Australia’s enduring civilisation<sup>12,13</sup>.

Recognition and validation of the existence of a large knowledge gap, and removal of the deficit view of Aboriginal culture creates space for a realignment of perspectives. We argue that this 'knowledge gap' approach supports opportunities for even-handed exchanges of knowledge, and mutual contribution of ideas and skills. In university contexts, where the focus is on learning and engagement with ideas this is a manageable endeavour. It is focused on the building of relationships on the exchange of knowledge, ideologies and methodologies.



## EXPLORE ENGINEERING FROM THREE PERSPECTIVES

Incorporating Aboriginal perspectives into academic curricula could happen in many ways and mean a thousand and one things. We found that exploring an artefact from multiple perspectives is a great point from which to begin considering what might be done.

The term ‘perspectives’ in this context could have many meanings, so on our journey towards achieving an insight into Aboriginal perspectives, we chose to use a definition of perspectives as simply ‘the way in which we look at something’.

How would you describe your perspective on Aboriginal Australia, Aboriginal society and even Aboriginal Engineering?

While this might seem to be a straightforward question, the members of our team found it a complex issue. The search for answers led to identification of the fact that three different perspectives must be considered in unison for engineering educators to establish the value and usefulness of incorporating Aboriginal perspectives into their curricula. This led to employment of a Venn diagram as a means of developing a useful conceptualisation of the relationships among these three perspectives.

As with other aspects of this work, we began developing this element with a question about why it is so difficult to see things from more than one perspective. Our discussions initially focused on what we identify here as the ‘dominant’ and ‘Aboriginal’ perspectives. This inevitably led us into the trap of an ‘either/or’ false dichotomy, creating a dead-end of mutually exclusive positions. While we knew this was unhelpful and counterproductive it remained hard to find a way out, until we recognised that all professions acquire a distinctive point of view as a result of their training. From there it was a short step to realise that an Engineers perspective cannot simply be subsumed under either one or other of the ‘dominant’ or ‘Aboriginal’ perspectives. Engineers are problem solvers, utilising scientific principles and the engineering method to develop technical solutions for particular purposes. An Engineering Perspective is distinct from both ‘Aboriginal’ and ‘dominant’ perspectives in that those who acquire it view things differently from those who do not have it. Recognising this helped turn our work into an exploration of perspectives as having ‘both/and’ characteristics. It is possible to have a ‘dominant’ perspective and also an ‘engineering’ perspective; and it was equally evident that an ‘Aboriginal’ perspective and an ‘Engineering’ perspective co-exists. From there it was a short step to the familiar mathematical/engineering Venn

diagram to help consider these three perspectives.

#### **DOMINANT PERSPECTIVE**

The term ‘Dominant’ perspective refers to the broad, generally held, views of Australian society. It shapes much of what is taken for granted in social interactions and informs many policies promoted by governments, the forming and reforming of legislation, and important issues such as land development. The Dominant perspective contributes heavily to the ‘deficit view’ described above. It assures those who hold it that theirs is the correct view, as it is also the commonly held view. Paradoxically, given its dominance, it is the least obvious of the three perspectives, being so integral to the Australian social context that its influence is simply invisible, because it is what most of us ‘know’ and do not question. In Australia this dominant perspective is built on traditions of western European thinking. Ownership of property is a central tenet, along with beliefs in the superiority of human beings over all other species and a preference for ‘either/or’ thinking.

#### **ABORIGINAL PERSPECTIVE**

Developing a means of representing our version of an ‘Aboriginal’ perspective is explored in the next section of these guidelines. At this point it is vital to note that having an articulate and passionate Aboriginal member of the project team was crucial to recognition of the need to distinguish between the two initial perspectives. A life time spent learning about each and coming to terms with how they influence and shape actions and reactions ensured that the distinction received conscious attention quickly and firmly, although the significance of needing to do so took longer to emerge. An ‘Aboriginal’ perspective was held by only one member of the team, and its presence made all the difference in recognising why ‘different perspectives’ were central to engaging with the project topic and goals. While we cannot claim to be able to represent an Aboriginal perspective in any detail it is clear that it differs vastly from the ‘dominant’ perspective. As noted in the introduction, relationship to Country is at the core of all Aboriginal values, and country cannot be owned in the manner of western ‘ownership’. There are no ‘superior’ beings, since

all life has equal value and its place in the world is assured by relationships not hierarchies. Thinking is pluralistic and ‘both/and’, not individualistic or ‘either/or’.

For Engineering educators intending to use these guidelines in your own work, we strongly recommend that you establish a positive connection with your local Aboriginal community and – where possible – have at least one interested member of the community engaged regularly with your work to represent this perspective.

#### **ENGINEERING PERSPECTIVE**

As the notion of adding an ‘Engineering’ perspective to create a Venn diagram emerged and took hold, it added to the complexity of identifying how to incorporate Aboriginal perspectives into Engineering Education – and simultaneously made some solutions obvious. How does an Engineer think differently from those who are not Engineers? What is an ‘engineering’ perspective? The non-Engineers in the team came into their own here. Having them on-board was as vital as having that Aboriginal voice. The engineers in the team shared a well-schooled understanding of ‘engineering thinking’ that had become so innately familiar as to disappear from conscious thought in normal routines – while remaining ever present in its impact on actions. How could it be described / differentiated from other perspectives?

We chose to think of engineers as primarily ‘practical problem solvers’ where an engineer’s world is ‘problem centric’. Life and country have relative positions chiefly in regard to the nature of, and solutions to, problems. Superior solutions are valued, and thinking is focused on how to address problems rather than on considerations of the merits of acting/not acting. An engineer excels at understanding the nature of gaps in service, performance, comfort and access – and aims to develop solutions to specific problems as they arise. Where a non-engineer may consider a wide river to be a ‘beautiful place’ or ‘an impassable barrier’ an engineer will regard it, first and foremost, as implicitly raising the question of ‘how can it be crossed most effectively/efficiently/quickly etc.?’. Engineering education is, therefore, focused on understanding how things work – in order to make them ‘work better’ in some definable manner.

## THE INTERSECTION

Just as with the dominant and Aboriginal perspectives, talking about an ‘engineering’ perspective is simply a way of helping everyone – engineers and non-engineers alike – distinguish among different viewpoints. The essential step is to be able to accept, and hold steadily in mind, the knowledge that all three perspectives co-exist, even if we are more familiar with one or two, and are encountering a third for the first time.

Having recognised that three perspectives were involved in creating the intended outcomes of the project, and having arranged them into the Venn diagram as shown above, we turned our attention to the centrepiece of the diagram – the ‘intersection’. It identifies a space for developing teaching strategies and ways of drawing attention to the differences and similarities among the three perspectives<sup>14</sup> and also prompted work on identifying specific sites of Aboriginal engineering which could be compared with more well known engineering projects of similar antiquity.

Once we had developed the components of Venn diagram we began exploring the importance of the ‘intersection’. When introducing the diagram to interested observers, we were frequently asked why we distinguished between ‘dominant’ and ‘Engineering’ perspectives. Many observers considered that there was no need to distinguish between them – ‘after all’, they asserted ‘engineering is part of the dominant perspective’, and frequently asked ‘what engineering did Aboriginals have?’ Patience was needed to hold steady our resolve to use the Venn diagram as we worked to address these questions. In an interesting way these questions provoked the project team to explore further the issue of ‘Aboriginal engineering’. Were there (had there been) indigenous Aboriginal engineers? What engineering did Aboriginal people do? How do we know this? These questions have much larger answers than can be included in these guidelines, but the immediate answer is simply that, of course there were Aboriginal engineers. They manufactured materials, conducted mining activity, undertook complex agricultural and land management activity, built boats, and generally employed engineering principles in a manner that engineers in all other

cultures applied around the world.

Recognition of this led to some further perplexing questions – why was there no recognition of Aboriginal engineering achievements, when Europeans arrived? Why are there so few (if any) mentions of ‘Aboriginal engineering’ in early written records of Australia? What formative principles had shaped Aboriginal engineering that it was so invisible to European eyes?

## EXPLORING EXAMPLES AT THE INTERSECTION

The initial conceptualisation of the Intersection focused on the idea of identifying and using ‘artefacts’ which could exemplify aspects of at least two of the three perspectives, and in doing so could highlight the nature of the place where all three overlap and have shared features. For example a didgeridoo made as a wedding gift in the Northern Territory in the late 1960’s helped engineering academics explore cultural, social, historical and engineering aspects of such an item. Similarly a very old woomera found in the Illawarra provided opportunities to explore the diversity of such forms across the continent, while highlighting the fact that their concept and design demonstrate finely honed application of engineering concepts including mechanical advantage and mechanisms.

There are a large number of known Aboriginal engineering sites around Australia, yet only one – so far – has been officially acknowledged as such. This is the site called Budj Bim in the Gunditjmarra country of south western Victoria<sup>15</sup>. Many other sites are currently better known by archaeologists and are ripe for re-exploration as engineering sites. For the purpose of these guidelines we offer a comparison between Budj Bim and the Nîmes aqueduct in Southern France. Budj Bim is a vast and complex Aquaculture system consisting of constructed dams, ponds and channels designed to direct and store eels and fish for routine harvesting. It is archaeologically dated at 8,000 years of continuous use. The Nîmes aqueduct was built in the early years of the first century of the Current Era to provide a constant water supply to the Roman colony in what is now the city of Nîmes. Both systems were constructed to support concentrated populations, both required

precision in construction to manage water flow, both required an in-depth understanding of natural processes.

However, the very different cultures and values informing each set of engineering solutions, produced very different systems. Budj Bim, was built on principles of respect for country so that all its work has a low profile which – while evident to early settlers – did not reveal its purpose and scope to them. The Roman aqueduct, in contrast, stands above the landscape, dominating everything and making its purpose very prominent and explicit to all who view it. As examples of comparative engineering these two sites illustrate the fact that solutions to similar problems can be engineered in quite different ways. The educational focus for exploration of such comparisons will be on the cultural factors influencing decisions about water resource management, and the implications of these for related engineering activity.

In the context of the project goal of integrating Indigenous perspectives into engineering education

the Venn diagram becomes a tool with which to identify and assess local points of interest which may provide scope for educational activities directed at exploring ways in which Aboriginal, Dominant, and Engineering perspectives are equally relevant and important for understanding both past solutions and planning for future, culturally sensitive ones. Present day examples where this process is necessary are exceptionally common, and take the form of Aboriginal community consultation to identify sites of archaeological and cultural significance, and negotiation of land use agreements with Traditional Owners. These are particularly critical for large infrastructure and mining projects. By identifying local sites and familiar artefacts, and then exploring them through the lens of the Venn diagram, you and your students will better understand how problems are identified and addressed when different perspectives and cultures overlap and particular ideologies influence engineering endeavour.





## CONSIDER AND VALIDATE AN ABORIGINAL PERSPECTIVE

Aboriginal people are not all the same. There are over 400 different Aboriginal countries across the continent of Australia, each with their own language, customs, cultural practices, stories and dreaming's<sup>16</sup>. These differentiators however, are underpinned by a similar set of philosophies consistent with an Aboriginal Australian worldview. For example the notion of 'Country' is a philosophical constant for all Aboriginal people, resulting in a similarity of value systems, hierarchies of respect, and methods of approach to societal and cultural order.

Mary Graham<sup>17</sup> states that the basic precepts of an Aboriginal worldview are:

- The land is law, (and)
- You are not alone in the world

She demonstrates that land is a sacred entity and for an Aboriginal person is the most significant relationship throughout their in life. The second most important relationship is that among people themselves. She states that 'no matter how western and urbanised Aboriginal people have become, this kinship system never changes'<sup>17</sup>.

Who are the Aboriginal peoples related to your place? What is their view of the world? How do they

signal their connections with country? Discussions with Yuin (Illawarra and South Coast NSW) Aboriginal communities over several years contributed to the articulation of five concepts that capture one 'Aboriginal Worldview' and its underlying principles. These are expressed as: Country, Kinship, Culture, Journey, and Connectedness -

### COUNTRY

As already noted, Country refers to one's relationship with place. It is intimate and sacred. It is personal, and often referred to as one's nature. Country does not just mean the escarpment and the hills, the waterways and the sea. Country is all living things. It is people, plants and animals. It embraces the seasons, stories and spirituality. Country is both belongingness and one's way of believing.

Country is an Aboriginal person's highest order.

### KINSHIP

One's Kinship identifies you as a person. It tells both yourself, and all those around you, who you are and how you belong. It defines how you are related, and in relationship with the significant people within your life. Kinship for Aboriginal people goes a step further

by obligating and binding each individual in a 'give and take' relationship system that is nurtured by Country, story and shared lived experiences. For Aboriginal people all relationships are significant; kinship however represents 'ngarpartji ngarpartji' (the give and take of relationships).

#### **CULTURE**

The way in which culture is understood by the Aboriginal people of the South Coast is through their day-to-day expression of their lives. It is one's lived articulation of how they belong. Where culture can be expressed through spirituality, ceremonies, stories, and even foods, the important fact here is that, for an Aboriginal person, culture is connected and particular to their Country and their Kin. It is connected to the stories and history of their Country and their Kin through to the Dreaming. Aboriginal culture is an ongoing story of connection, expressed through the resilience of a people now living in a context that has frequently denied them their spirituality and humanity and relationship with their Country and Kin.

#### **JOURNEY**

One's Journey is the story of a person's lived experiences. From before birth an Aboriginal person's story begins, as one's individual story incorporates the intertwining set of stories of one's parents, and grandparents, and great grandparents, back to the ancestors, back to the dreaming, and then returning back to our present day. One's Journey will be filled with significant moments that have created their connections to Country, to Kin and to Culture as lived day to day. One's Journey shapes and accentuates the sense of belonging to each aspect of one's life and every aspect of one's worldview. One's Journey explains why I am, who I am, and where I am from.

#### **CONNECTEDNESS**

'Aboriginal' is a way of life, an understanding. It's the way you're brought up, it's the way you live in this world... it's about history and story, politics and culture... it's about belonging...

Connectedness is the term used by Aboriginal people to define the way they view the world. It can be also expressed as belongingness, in relationship with, at one with, or sometimes as attachment. All these words are attempts by Aboriginal people to articulate an indescribable connection to their Country, Kin, Culture and Journey. Connectedness is the capstone concept - it denotes that each of the preceding concepts are inter-related and inter-dependent and none can exist separately from the others.

It is this worldview, this perspective, which essentially creates a differentiation between an Aboriginal person's approaches to a solution and that typically used by a non-Aboriginal person. For Aboriginal peoples who are connected to the South East coast of NSW, notions such as belonging, connection, and inter-relationship explain the world and how it works. It articulates land, law and even love. It is an understanding that is learnt through lived experiences and becomes one's compass for negotiating the journey of life. Such a worldview sustained the traditional peoples of this region for thousands of generations in harmony with their environment. Today, it still provides the underpinnings of this philosophical outlook, its values and priorities that influence and guide their descendant's decision making and negotiation of the current cultural domain.



## ENGAGING WITH COMMUNITY

This project was able to connect with the Aboriginal communities of the Illawarra and south coast. For others taking up the challenge of integrating an Aboriginal perspective into engineering education curricula, the undertaking is to identify the value sets that underpin the decision making processes of the Aboriginal people and communities you are engaging with.

Just mentioning the words ‘engaging with Aboriginal Community’ can start a head aching. Before even beginning to contemplate the complexities involved, the question that confronts us is ‘where do you even start?’

The following framework is a guide to help identify appropriate considerations, reference points and expectations that surround community engagement and consultation. Over the course of history since 1788 Australians have gradually become aware that Aboriginal and non-Aboriginal people have different understandings, processes and protocols surrounding engagement and consultation. As consultation with Aboriginal people becomes a more significant aspect of Australian engineering activity today, all those involved need to appreciate the features of an Aboriginal perspective as the most vital aspect of any project for Aboriginal people.

The opportunity to engage with your Aboriginal community will enable you to identify appropriate knowledges to embed within your curricula, involving you firsthand in the experience of the consultations, engagements and relationship building your graduates are likely to encounter. It should also be understood that the journey can, indeed should, be shared with students and other staff members.

### **FIVE RIGHTS**

The following section introduces the next element in our Infographic. It sets out what we call the ‘5 Rights’. Together these constitute a model for considering the essential right elements to address when engaging and working with Aboriginal Communities. While we present these five elements in a particular sequence here, there is no particular order in which to address them when beginning your own approach to engagement. Each has its own importance, and all work together in a holistic manner, such that omitting any one of them will render useless all efforts made about the others. The Five Rights are: Right people, Right place, Right language, Right time, Right way.

### **RIGHT PEOPLE**

All consultation efforts require the right people.

When working with Aboriginal communities, identifying the right people can initially appear to be an overwhelming task. Aboriginal hierarchal structures are unlike those of the dominant Australian culture, and are not necessarily consistent from community to community. Although there is a decent understanding that Eldership within Aboriginal communities defines decision-making power, Elders are not necessarily the right people to approach when you are first considering how to introduce the reasons and objectives for your proposed consultation. Possessing a clear understanding of what you are hoping to achieve is essential for identifying the right people to engage with. This will mean, for example, you need to understand the kind of knowledges you wish to embed in your curriculum, so that you can find the people with relevant understanding of your goals, who can then help you identify the right Elders to approach. If you are seeking to engage an Aboriginal community member to deliver a guest lecture, for example, the best 'right person' will be one who is on country and can therefore speak first hand about the surrounding context. In all instances, the question is – Where to start?

Most Australian universities have an Indigenous student support unit and/or an Indigenous education unit. These units are referred to by different names, some use a term drawn from the local Aboriginal regional language and some do not. These units deliver similar functions of support for Aboriginal students and/or Aboriginal centred education and are a logical place for you to begin your local search, since you're on campus. The units are a good starting point when looking to find the right people within your Aboriginal community. Aboriginal people working within these units may be the 'right people' you need – or they may not. In any case they should know and be able to connect you with the people you need to meet, and are likely to be the right people to make the introductions. At the very least, they should be

able to direct you to the appropriate people you need to speak with in order to establish a relationship with the right Aboriginal people who can advise and guide you towards your goals.

Regardless of whether you begin your exploration by connecting with on campus Aboriginal people, or go direct to known members of the wider local community always keep in mind the task of building strong and ongoing relationships with that Aboriginal community. It is essential to build appropriate links that are particular to your place – the country on which the university stands and the people who are its carers. This is where you will gain greater connections and experience the most authentic connection with country and community.

#### **RIGHT PLACE**

Place is one of the most significant physical and spiritual ideologies for Aboriginal people since it is related to Country. This means that any successful engagement with the 'Right' Aboriginal people must be built on an appreciation of the extent to which place is a significant contributor to building positive relationships. This appreciation must be evident and deeply felt if you are to build a long lasting relationship that achieves positive outcomes. This is simply because, for Aboriginal Australians, place denotes a relationship.

The easiest way to identify the Right Place is to consider the concept through the Aboriginal worldview that you have previously validated for your Aboriginal community. If you are still in the process of learning this framework, you are welcome to make use of the elements of the Aboriginal perspective we have shared above, noting that they are likely to differ in meaning somewhat. To illustrate this in action the following section suggests how to apply that perspective to those five components -

COUNTRY

When considering the Right Place within the concept of Country be alert to the impact of the physical nature of the environment or surroundings where you will be engaging with the local community. How will the place where you are meeting specifically set the tone for the engagement? Are you meeting with the Right People at the University? In your office? At a coffee shops on campus? In a formal meeting space?

A University campus can be intimidating to anyone not familiar with higher education, and this may impact on first impressions and the tone of the meeting. Perhaps a first meeting in a Community facility setting will be a more authentic way of enacting your respect for the position and traditions of those you are seeking to engage with.

KINSHIP

Kinship is a complex set of relationships that are well established within a community – and across and among communities. However they are not readily visible to newcomers. This often gives rise to the process of exchanging relationships at the beginning of new connections. Knowing these threads of relationship enables Aboriginal communities to sustain their linkages in a formal and appropriate manner, yet in ways that are not made explicit to outsiders – non-members of the community. Kinship can have an impact on choosing the Right Place to meet, so you need

to do your best to understand the relationships that may be associated with the place. Is the place affected by factional differences in the community? For example, if you choose to meet at the Local Aboriginal Lands Council (Health Centre, Legal Centre, etc.) find out if the people you are meeting, or their family members, are members of (or associated with) the owners/managers of the location? There is every possibility that they are, but if they are not, choosing a place that does not respect current kinship factors could negatively influence your hopes for deeper engagement.

CULTURE

Consideration of the concepts Culture and the Right Place will be around identifying the daily function of the place where you've chosen to meet. The important issue is awareness of how the function of the place aligns with day-to-day activities of the Aboriginal people you are meeting. If the culture of the place is not aligned with the

culture of the people, this will obviously impact the outcomes of the engagement. Establishing the rightness of a place in regard to culture, requires ensuring you have explicit agreement, from the people themselves and/or those who are making the introductions.

JOURNEY

The concept of Journey in this instance speaks of the stories, experiences and histories of the Right Place. Every place has a story, and Aboriginal people are connected to the stories that are associated with places. Although it is not as simple as engaging with Aboriginal people in a place

with a positive history, it is a consideration worth checking. Beginning your engagement in a place with a negative history for the people you are meeting, may result in negative outcomes whose origins you may not even be able to establish.

CONNECTEDNESS

Connectedness in relation to place again operates as the capstone concept. It denotes the inter-relationships among all of the other concepts. For the Right Place to be right each of the concepts must have been considered and addressed to the

best of your ability. There will be times when some factors cannot be provided for in a particular place, however you can be sensitive to the difficulties and make your own awareness known as you work towards achieving understanding.

**RIGHT LANGUAGE**

All engagement requires a diplomatic approach to ensure success. Aboriginal people emphasise the importance of oral history, so using the Right Language is a principal tool of diplomacy. Your initial objective, when considering language, is to find a common and thus Right Language for engagement in this context. This reduces the possibility of being misunderstood and also the likelihood of causing offence.

Many Aboriginal community members, especially Elders, are weary of talking with people from universities because of past history of anthropological studies, which seem to have generated misrepresentation and appropriation of stories, knowledges and communities. In some instances Elders may simply feel uncomfortable because they are sensitive to the limits of their own experiences of formal education. Using the wrong language may not only stifle engagement efforts, but can actually appear to exclude them. To ensure you

**Many of the decision makers you will talk with will be Elders who may not have completed a formal education**

- Make your language direct and specific
- Avoid use of discipline-oriented jargon words
- Be respectful and allow time for thinking
- Do not rush the conversation

**Urban and rural Aboriginal people may speak versions of Aboriginal English, where some English words will have different meanings.**

- Listen with care to the meaning of the whole message
- Ask respectfully, for explanation of comments that are unclear
- Show your ability to communicate in this context by listening more than talking
- In such conversations the meaning of a message may be found trailing along behind the words used – stay alert to these late arriving meanings

**Rural and remote Aboriginal people may speak one or several Aboriginal languages before English, impacting their understanding and comprehension of English.**

- Establish as much as you can how many – and what - languages are spoken by your guests
- Search out words with shared meanings to help achieve agreement
- Use the meeting as an opportunity to learn more about how the local languages speak about country

**Spoken and written language comprehension will differ considerably. The overall objective is always to be clear and not condescending**

- In all contexts ensure you have spent enough time to develop a clear and relevant description of your goal
- Ask for advice about the value and validity of your goal – perhaps they have other ideas that could be better addressed than the one you are thinking of?
- Listening will reveal how best to achieve mutually beneficial outcomes

**RIGHT TIME**

For Aboriginal people there is a strong understanding that knowledge and learning are handed down through time. Consideration of when is the Right Time is much more than a process of ascertaining the best day or hour to engage with the Aboriginal people, decision makers or community members you have identified. It includes demonstrating your understanding that acknowledging ‘time’ equals showing respect. Time is valuable to all people. In working with Aboriginal people you are acknowledging in this instance that there is a different value placed on time for Aboriginal people when engagement or consultation is taking place.

The term ‘Koori-time’ (in reference to Aboriginal people of South Eastern Australia) exists because it seems to non-Aboriginal eyes that meetings rarely start on time, almost always go beyond the agreed time and that it can be difficult at first to understand when a meeting has begun or when it has ended. The term Right Time indicates a blurring of the personal and the professional. The value you place on the relationship you want to build may be best indicated by the way in which you allow the timing and the process to unfold. If you are unable to hold your own sense of timing in check, and don’t allow the meeting to unfold in Aboriginal time, you may miss the moment when shared decision-making about agreement to assist you has occurred. The

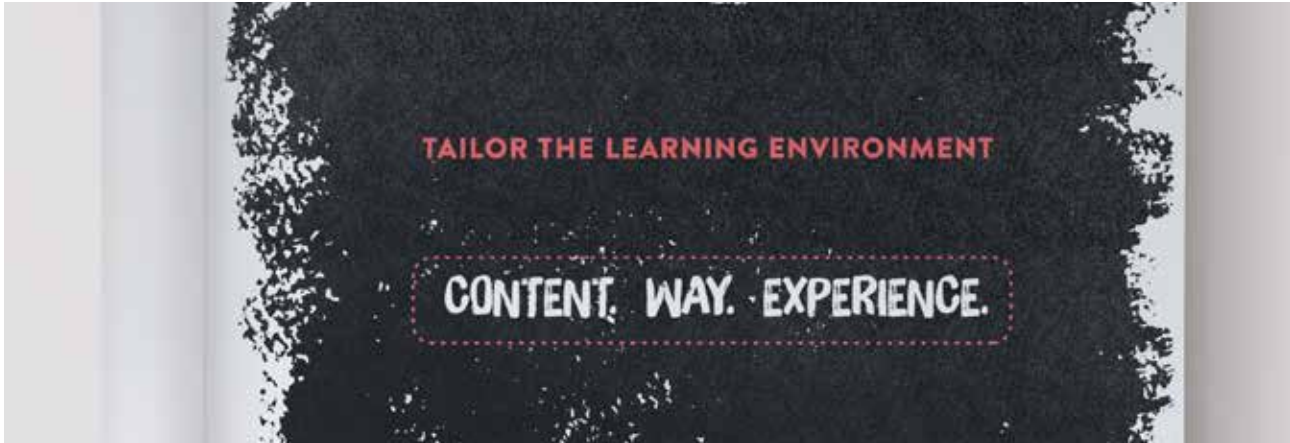
arrival of such decisions can become self-evident as the meeting moves gently on in conversation and discussion, when you allow the process to dictate and follow its own rhythm. When you do so you gradually understand that you have agreement and – more importantly – that it has been given because you are able to demonstrate respect for these ‘right things’. You will have shown that you know how to do things the right way.

**RIGHT WAY**

The Right Way acknowledges that -

- the Right People have been consulted
- in the Right Place
- with the Right Language
- at the Right Time

It is a term widely used by Aboriginal people to recognize the appropriateness of one’s behaviour. It is often used in an off-the-cuff manner, not formally applied, but delivered humbly through conversation with respect and appreciation. It is a sign of respect and recognition that will contribute to your ongoing relationship. When someone, with whom you have been engaging, uses the term right way in a conversation as a passing comment, you will know that you have indeed addressed the Five Rights in a manner that is accepted and respected in return.



## TAILOR THE LEARNING ENVIRONMENT

### AN ESSENTIAL SHIFT IN PERCEPTION

This final aspect of the guidelines introduces the key element of integrating Indigenous perspectives into engineering education. This involves a shift in the modes of teaching required to authentically model Aboriginal forms of knowledge and methods of guiding learning.

Much of our own knowledge as qualified academics and researchers has been acquired through engagement with traditional ‘dominant’ forms of education where the emphasis is on imparting information and assessing individual capacity to reproduce it on demand. This is very different from traditional Aboriginal teaching and learning modes, which equate more closely to what is now called ‘discovery learning’. Only when we stood well back from our own work, could we begin to see that full and immersive engagement with Aboriginal forms of learning does not begin with knowledge content. It starts with practice and exploration. Aboriginal modes are about leading by example, providing ways for students to figure things out for themselves and allowing learning to evolve within the individual student. As such any authentic engagement with

Aboriginal perspectives will involve an approach quite different from the teaching modes familiar to most university educators. Thus the focus is less about providing new knowledge than it is about encouraging skill and awareness development through first-hand experience.

### CONTENT

Knowledge about Aboriginal perspectives has been included in academic disciplines such as education, health and law for several years now; and there is a general trend within the higher education sector to increase the emphasis on Aboriginal perspectives in all disciplines. However in many cases this has meant finding appropriate case studies and information about examples of Aboriginal culture in the form of content to be added into conventionally structured subjects, without substantially altering the mode of delivery. Such an approach can result in misappropriation and misrepresentation, especially when there is no local engagement with the people about whom information is being presented. Not unexpectedly, this can be offensive (however unaware and unintentional) and contribute to a further disparity between Aboriginal and non-Aboriginal communities.



The difficulty here is evident. Conventional educational modes consider that transmission of content is most important and therefore design teaching strategies to support this. However for Aboriginal people knowledge is acquired through experience and a gradual evolution of stories guiding development of insight<sup>18</sup>.

Although we now consider that content is the secondary component of the integration process it is useful to suggest what kinds of content you will need to collect as you undertake the process of enabling students to comprehend Aboriginal perspectives. These are suggested bases for collecting and arranging relevant content:

- Stories/experiences from within the local community that illustrate such things as Local interpretation of landmarks, relative and relational significance of specific sites and artefacts both from the distant past, and the current context
- Histories at the macro scale of the continent and the more immediate scope of local and regional historical events
- Data about connections and materials and discipline specific facts relevant to a subject or curriculum
- Examples relevant to specific sections of curriculum knowledge that are also appropriate to the stories and histories you have collected and reference
- Design scenarios that support exploration of content rather than transmission of information without context

**WAY**

If content is not the place to begin – what is? Western paradigms of education have recently been developing their own responses to this question, and interestingly they appear to align quite neatly with Aboriginal traditions of learning. The modern theories have various names including ‘constructivist’, ‘participatory’, and ‘action-oriented’. Collectively they draw attention to the learner as the essential

focus of educational activity. Their theme is described by users as ‘teach the student not the subject’<sup>19</sup> and by researchers as requiring attention to Aligning assessment with long-term learning<sup>20</sup>. In effect the proposition is that ways of engaging with learning need to be other than formulating content to be transmitted, they must also involve more active modes of engagement including story telling, exploration (guided and unguided), and use of puzzles with known solutions as well as problems with no known answers.

This way of guiding learning will not necessarily be at all comfortable or familiar to many academics. However it will prove to be an essential element of change and engagement. The role of academic educator shifts towards facilitation of learning rather than direction and transmission of information by facilitating relationships that:

- Involve local Aboriginal people as both learners and educators, by enabling students and community members to work collaboratively on matters of mutual interest
- Respect the 3 perspectives (Dominant, Engineering, Aboriginal) in order to assist all parties gain insights into each others’ basic thinking parameters and the impact of those on actions

- Assist students to learn how future workplaces will require them to balance decision-making among the demands of multiple domains.
- Guide students as they go about developing and completing projects that extend their individual learning capacities with the help of real life/real time projects that explore current issues and problems.

#### **EXPERIENCES**

Students' journeys in the academic learning space will be varied and are always highly individual. Their experiences will shape their approach to learning as well as their relationships with others – staff, students and Community members. Providing students with direct experiences of engaging with Aboriginal community partners allows these journeys to evolve in diverse and unique ways. While this means that academic staff may be less able to predict events as they unfold, it also means that students can learn the outcomes of their own actions in a supportive environment. It also creates space for

student to develop relationships that may continue to guide their approach to engaging with Aboriginal communities in a future professional setting.

Assessment tasks must be extended beyond measuring recall of facts and figures to include components that enable students to demonstrate how they are now able to:

- Overcome unexpected challenges
- Apply effective communication strategies to puzzling situations
- Employ insights into the different perspectives encountered
- Design and implement creative and innovative approaches to unanticipated emergent problems

*“Relationships focusing on Aboriginal perspectives will enrich your subjects and discipline while preparing students to work in an engineering industry that is increasingly being asked to consider, engage and foster partnerships with Aboriginal Australia.”*

Our journey and experiences though this project have led us to recognise the concepts of relationships and time as the key underlying principles for addressing the complexities surrounding inclusion of Aboriginal perspectives in engineering curricula. Our advice is that you allow sufficient time, and pay attention to building long lasting relationships, to reduce the difficulty of incorporating Aboriginal perspectives and providing an inclusive student learning experience.

To some people the idea of building relationships with Aboriginal people might seem overwhelming. The relationships we are encouraging you to adopt are working relationships. Collegial, positive, respectful and functional relationships that are on-going, will bring fresh viewpoints and fascinating challenges for both staff and students. Your objective is to build relationships that are built on the contributions of all parties towards the betterment of your curricula and your student learning experiences and outcomes. Relationships focusing on Aboriginal perspectives will enrich your subjects and discipline while preparing students to work in an engineering industry that is increasingly being asked to consider, engage and foster partnerships with Aboriginal Australia. Such relationships take time. The types of relationships we are suggesting are achievable, they just take a little bit more time to establish before they become just like any other professional relationship you manage as part of your role.

This is your starting point. This is the Aboriginal way.



To end where you start, and start where you end, to consistently deconstruct and reconstruct, to adopt a reflective approach that inspires personal development through sharing – that is – through investment of time and in relationships.

Our intimate learning throughout this process has been the realization that Relationships and time with Aboriginal people and their communities are critical tools that you can use to extend and enrich your curriculum. These two particular concepts indicate the means of achieving sustainable change and progress towards reconciliation of Aboriginal and non-Aboriginal Australians.

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## ENDORSEMENT

*Draft of this document was endorsed unanimously by Elders and community members of the Yuin people at the final 'Guidelines' consultation meeting held on the 30th January 2016.*

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