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Current engineering education and training practices on Aboriginal cultural heritage

Thomas Goldfinch

University of Wollongong, tomgold@uow.edu.au

Xavier Hollis

University of Wollongong, xh009@uowmail.edu.au

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Current engineering education and training practices on Aboriginal cultural heritage

Abstract

CONTEXT Previous research has highlighted the need for engineers to have some background knowledge of Indigenous Australian history, cultures and politics (Goldfinch, Ilango, Roland, and Willis, 2014; Leigh et al., 2015). This is particularly important where project engineers hold responsibility for developing or implementing Aboriginal cultural heritage management plans (Furry, 2015; Hartley, 2015) and compliance with relevant legislation (NSW Government, 2010; 2014). Engineering projects are often enabled, delayed, or significantly altered as a result of how sites and artefacts of significance are managed. At this stage, it is believed that engineers often negotiate these challenges with little to no training in Aboriginal cultural heritage.

PURPOSE This study sought to quantify recent engineering graduates' level of training received within industry, supplemented by what is being taught in tertiary education for negotiating Aboriginal cultural heritage.

APPROACH An online survey of engineering graduates was developed and distributed within Young Engineers Australia, student society, and Engineers Without Borders networks. The survey canvassed graduates' field and type of work, their experience with cultural heritage management and management plans, and the extent and type of education and training they have had in this area. Reconciliation action plans and Graduate Attribute statements of education providers and major engineering employers were also analysed to determine the extent of commitments to ongoing training of students and graduates.

RESULTS Survey results indicate that it is common for young engineers to encounter Aboriginal cultural heritage on engineering project sites. In addition, survey participants received little formal education on Aboriginal cultural heritage beyond high school, and reported low levels of confidence in dealing with such heritage matters. It is also clear that not enough is happening within engineering education to address this need.

CONCLUSIONS It appears that education and training is lagging behind legislated requirements for engineers and project managers. With the continued growth of Australia's population, large infrastructure projects will continue to impact on Aboriginal cultural heritage. Young engineers will need to be prepared to meet changing legal and societal expectations for the preservation of the nation's Aboriginal heritage.

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Current Engineering Education and Training Practices on Aboriginal Cultural Heritage

Thomas Goldfinch and Xavier Hollis
University of Wollongong
Corresponding Author Email: tom_goldfinch@uow.edu.au

CONTEXT

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Survey results indicate that it is common for young engineers to encounter Aboriginal cultural heritage on engineering project sites. In addition, survey participants received little formal education on Aboriginal cultural heritage beyond high school, and reported low levels of confidence in dealing with such heritage matters. It is also clear that not enough is happening within engineering education to address this need.

CONCLUSIONS

It appears that education and training is lagging behind legislated requirements for engineers and project managers. With the continued growth of Australia's population, large infrastructure projects will continue to impact on Aboriginal cultural heritage. Young engineers will need to be prepared to meet changing legal and societal expectations for the preservation of the nation's Aboriginal heritage.

KEYWORDS

Graduate training, Aboriginal Cultural Heritage, Graduate Attributes.

Introduction

In the course of engineering project planning and delivery, engineers frequently encounter requirements to identify, manage and protect Aboriginal cultural heritage sites. This creates a need for engineers to have some background knowledge of Indigenous Australian history, cultures and politics in order to manage culture and heritage matters appropriately (Goldfinch et al., 2014; Leigh et al., 2015). This is particularly important where project engineers hold responsibility for developing or implementing Aboriginal cultural heritage (ACH) management plans (Furry, 2015; Hartley, 2015) and compliance with relevant legislation (NSW Government, 2010; 2014).

The management of Aboriginal cultural heritage is becoming a larger part of the planning and scheduling process of Civil and Infrastructure projects in particular. Currently, schedule contingencies are being made to accommodate site inspections and unexpected finds protocols. However, effective strategies for management of Aboriginal cultural heritage are unclear, with one-size-fits-all approaches tending not to work as “ACH is not all the same as our traditions, Lore and Customs are diverse” (Brauer, 2014).

Relationships between Aboriginal stakeholders and proponents of industrial development are often strained (Furry, 2015). Engineering projects are enabled, delayed, or significantly altered as a result of how sites and artefacts of significance are managed and the project proponents’ understanding of where sites of significance exist. At this stage it is believed that engineers often negotiate these challenges with little to no training in Aboriginal cultural heritage.

This study sought to quantify recent engineering graduates’ level of training received in formal education and within industry. This is supplemented by an exploration of what is being taught in tertiary education for negotiating Aboriginal cultural heritage.

Understanding Aboriginal Cultural Heritage

Aboriginal Cultural Heritage within NSW is primarily regulated by part 6 of the National Parks and Wildlife Act 1974 (Packham, 2014). The department for managing Aboriginal cultural heritage in NSW is the Office of Environment and Heritage (OEH).

This legislation provides a blanket protection encompassing all Aboriginal sites, objects and places listed with the OEH register. Ownership of these objects and sites under legislation is given to the NSW Government not the original custodians of the land, meaning the state retains the final say in determining whether something is cultural important or not.

Under the National Parks and Wildlife (NPW) Act 1974 (NSW Government, 1974) something is constituted as an item of Aboriginal origin if it is:

“any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.”

Place and community are important elements parts of Aboriginal culture that create links between people and the land. Within the NPW Act, places or areas of significance are described as “lands dedicated as an Aboriginal area under this act” (NSW Government, 1974). Some Aboriginal leaders and other cultural representatives critique this method of categorisation and protection, claiming that this limits the protection on previously unregistered sites (Porter, 2006). The public identification of the location of cultural and or spiritual sites goes against many fundamental Indigenous Australian beliefs (Chapman, 2008).

The legislative frameworks in NSW have equivalents in all states and territories. While these government acts and guidelines were created to protect and conserve Aboriginal and Torres Strait Islander cultural heritage, in reality, their intentions are regularly challenged by continuing infrastructure and industrial development. This creates a very complex legal, political and cultural space to be negotiated by engineers as proponents or contractors involved in these developments.

Method

The objective of this study was to determine and quantify the types of education and training in negotiating Aboriginal cultural heritage that graduates have experienced. Hence, a quantitative online survey was chosen for its simplicity and ease of distribution. The web platform "Survey Monkey" was used and the survey distributed through Young Engineers Australia regional chapters' social media pages, Engineering student society social media pages, and an Engineers Without Borders newsletter.

In developing the survey, several issues relating to data reliability were considered. Firstly, participants may select responses they believe to be 'correct', and not responses that necessarily reflect their beliefs (Walter, 2010). In order to avoid this, questions were carefully structured to avoid the suggestion of a 'right' answer. The survey instead provided a platform for participants to relay experiences rather than assessing beliefs, values or knowledge.

The decision to make the survey completely anonymous was to ensure that results didn't reflect back onto participants. It was recognised that if participants felt their answers may reflect poorly on their employer they may be tempted to falsify responses.

Obtaining a large response from a diverse group of participants was a key objective informing the development of the survey. Attention was paid to question length and section separation to encourage survey completion (Bryman, 2012). Question formats generally followed familiar types, multiple choice answers, checklists, drop down box questions, and short response. A page design suited the objectives of this study, grouping related questions on to one page, making them easier to follow and understand, aiming to improve the quality of responses rather than minimising completion time.

The breakdown of the survey reflects a progression of detail, asking basic demographic questions and where and how much training the participant has received towards the beginning of the survey before progressing into specifics like their experiences of encountering Aboriginal cultural heritage on site and how it was managed (see Figure 1). This progression of difficulty helps participants reflect on more and more complex issues through the survey with the intention of helping retain participants through the entire survey.

This study poses questions about what graduate engineers are being taught and their experiences regarding often complex ethical issues. However, participants are not asked to comment or provide a personal perspective on these issues. Although the survey may cause participants recall a difficult or stressful period of their employment, phrasing of questions avoided asking for details of situations. The nature of an online survey also reduces the risk of a negative reaction due to an ethical concern, giving participants the opportunity to withdraw participation from the survey at any time prior to completing the survey. The survey and research method was approved by the University of Wollongong Human Research Ethics committee.

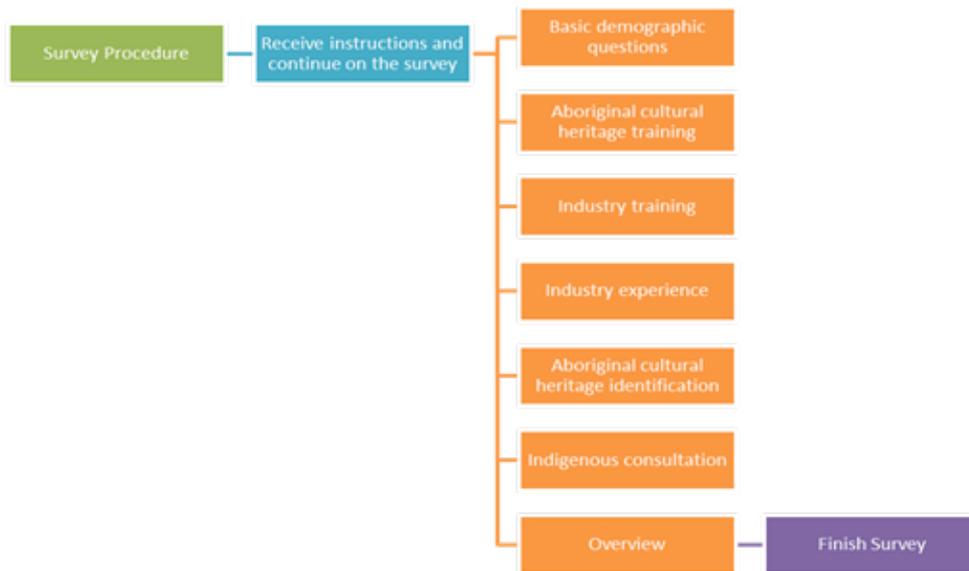


Figure 1: Survey structure

Survey results

At the time of writing, the survey had received 121 responses from participants from all states other than the Northern Territory and Tasmania. 96% of participants identified as Non-indigenous, and the majority (54%) were Civil engineers. In terms of Aboriginal cultural heritage (ACH) Training, 24% report receiving some form of formal training at University, while 29% report receiving formal or informal training in their workplace. Despite this, 50% of respondents have been on a site where there was a risk of finding or damaging ACH, and 28% have been on site when ACH has been found or damaged.

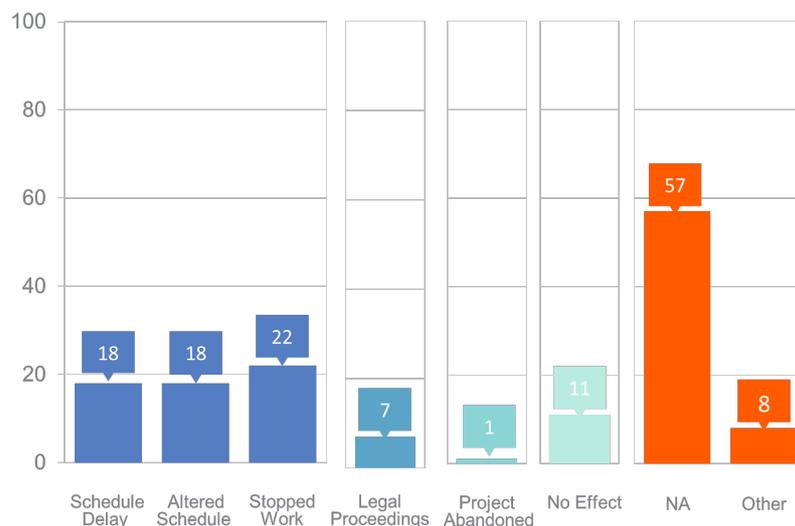


Figure 2: Impact of Aboriginal Cultural Heritage presence on site

Figure 2 presents the range of outcomes from the risk or presence of ACH on site. As identified in previous literature and interview-based research, negative impacts on project progress is relatively common. The reporting of these negative impacts by participants suggests existing ACH management practices for projects are not always effective. In asking participants whether any training on how to identify sites or objects of significance was

provided, only two respondents had received such training, and one reported confidence in their ability to identify items of significance. One respondent commented that:

...training states that if you encounter something that has a possibility of being a culturally relevant place or item, the correct procedure is to immediately stop work and consult an expert

This suggests that site engineers and project managers still hold responsibility for recognising items that warrant further investigation.

Participants were also asked to rate their confidence in making culturally aware decisions on a project based on their training and experience. Figure 3 presents a summary of responses, highlighting that most respondents remained unsure of their ability.



Figure 3: Confidence in making culturally aware decisions

Respondents commented that:

Training has made me aware of the presence of Aboriginal cultural heritage when undergoing engineering works, but it has been minimal in providing me with relevant knowledge on the respectful way to deal with these situations other than to consult a more experienced professional

And,

Based on the experience I have obtained within the work industry, there is not sufficient training provided to be confident with the decisions that will be made in regards to Aboriginal culture and heritage and I believe very many within my workplace would be able to make those sorts of decisions. This is why the Aboriginal culture and heritage guide is useful, but not enough alone. It lists the absolute minimums needed to proceed with the project and is not always clear to culturally unaware people and there must be much more training in universities and workforces for such situations.

Survey results also show that most students develop their understanding of Aboriginal cultural heritage in either primary or high school. Results presented in Figure 44 show that 57% of participants developed their understanding of aboriginal cultural heritage at Primary and 67% also reported learning at High school. Only 24% of participants reported developing their understanding through tertiary education and 17% through industry provided training or experience.

**Q8: Where did you develop your understanding of Aboriginal cultural heritage?
(select as many as applicable)**

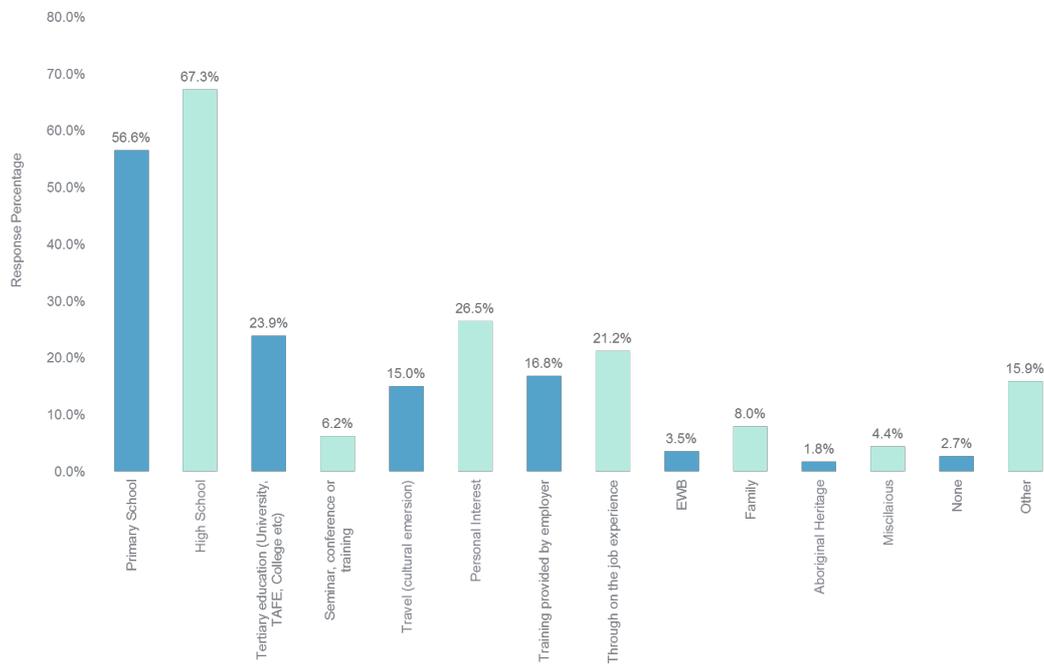


Figure 4: Place of Aboriginal Cultural Education

Current practices within universities

An initiative started by Universities Australia in 2011 in collaboration with the Indigenous Higher Education Advisory Council was aimed at increasing the number of graduates leaving university with some understanding and empathy for Australia’s Indigenous cultures. Surveys undertaken as part of this initiative suggested that as a whole Universities around Australia have made ‘significant advances’ in teaching and learning about Indigenous cultures and heritage (Universities Australia, 2011). Results from the current study tend to suggest that advances identified in the Universities Australia report may not yet have become visible to engineering students.

The provision of Indigenous cultural competence education to engineering students specifically is not mentioned in the Universities Australia report. Other disciplines such as “Medicine, Law, Business, Social Work, Psychology, Arts and Education” have Indigenous perspectives routinely included within their programs at approximately half of the institutions that took part in the “Indigenous Cultural Competency Project Survey” (Universities Australia, 2011). This lack of development within Australian universities’ engineering departments reinforces the requirement for further development into the education of engineers on social matters. For a discipline area that has such a large impact on the way Australian society is shaped in the future it is a significant omission from engineering education. This is particularly the case as engineering projects are regularly exposed to Aboriginal perspectives within Australia.

In order to confirm the results published in the Universities Australia report and review any changes that have occurred in university policies over the past 5 years, a review into every Australian Universities’ publicly available graduate attributes statements and reconciliation action plans was undertaken. Statements were categorised as Reconciliation Action Plan (RAP), Cultural Awareness (Graduate) Attribute (CAA), Indigenous Specific (Graduate) Attribute (ISA), and Indigenous Culture Education Program (ICEP). Graduate attributes

relating to cultural awareness for the purpose of this study were defined as a statement or specific commitment to student’s development of cultural awareness, while statements relating to ethical behaviour or being a part of a multicultural environment were not considered. An Indigenous specific attribute was defined where knowledge and understanding relating to Aboriginal and/or Torres Strait Islander cultures and heritage was defined in the attribute statement. Universities which have developed current Reconciliation Action Plans (RAP) was recorded, similar, but less detailed documents such as “Indigenous education statements” or “statements of reconciliation” were not considered. The results are presented in Table 1.

Table 1: Australian Universities graduate attributes and training programs relating to Aboriginal cultural heritage

State	Universities	RAP	CAA	ISA	ICEP
ACT	2	100%	50%	0%	100%
NSW	11	36%	55%	36%	64%
NT	1	100%	0%	0%	100%
QLD	9	56%	67%	44%	89%
SA	6	17%	33%	17%	33%
TAS	1	0%	100%	0%	100%
VIC	9	56%	78%	22%	56%
WA	4	50%	100%	50%	50%
Average	43	47%	63%	30%	65%

Results from the review of current graduate attributes statements and reconciliation action plans (or similar) reflect the results in the Universities Australia report. As seen in Table 1 the majority of universities in Australia are working towards producing students that are culturally aware, however the inclusion of Indigenous specific graduate attributes are only seen in 30% of universities throughout Australia.

Results as, shown in Table 1, show that less than 50% universities have employed a RAP, with universities from NSW and SA having only 36% and 17% respectively. However, based on statements from any of the afore mentioned reconciliation policies, universities commitment to increasing Aboriginal cultural awareness among their students and staff through training or the inclusion of indigenous perspectives in course work, is wide spread, with almost two thirds of universities adopting some form of Aboriginal Cultural Education program.

Discussion

Results from the survey suggest that, although Aboriginal cultural heritage training may be provided to some students, this training appears to not be reaching or remaining with young engineers. This is concerning considering that 50% participants have been on site where there has been the risk of damaging Aboriginal cultural heritage and 28% of participants have been in a site where ACH has been impacted. Not knowing how to properly manage Aboriginal cultural heritage can lead to unintended consequences for Aboriginal community, employers and young engineers. Being able to identify items or locations of Aboriginal cultural heritage should a key part of a site engineer’s training particularly when there is the chance of find ACH.

This lack of understanding starts with tertiary intuitions. Reconciliation action plans (RAP) developed with “Reconciliation Australia” reflects a commitment to an organisation increasing “Aboriginal and Torres Strait Islander employment, retention, cultural awareness and procurement”, organisations are asked to report annually on their performance against

key RAP targets (Reconciliation Australia, 2016). The less than 50% of universities have adopted RAP's suggests a lack of commitment to Indigenous education policies.

These results are concerning as understanding how to identify and manage Aboriginal cultural heritage effectively can mean the difference between a short project delay associated with the preservation of a culturally significant item or place and extended delays and legal proceedings due to its destruction. With legislative changes already underway in some states, young engineers are likely to increasingly hold responsibility for negotiation and/or enactment of management plans to prevent the unintended destruction of an important Aboriginal object or place.

Conclusion

This study has presented a small snapshot of young engineers' experience, education and confidence in relation to managing Aboriginal cultural heritage in engineering projects. Results gained from this survey indicate a deficiency in training that has the potential to contribute to poor management of ACH on engineering project sites. Furthermore with the continued growth of Australia's population, construction of more residential zones, mining activities and large infrastructure projects will continue to impact on Aboriginal cultural heritage. As places of Indigenous cultural significance will come under threat, young engineers will need to be prepared to meet changing legal and societal expectations for the preservation of the nation's Aboriginal heritage.

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