

Indigenous data sovereignty in higher education

Towards a decolonised data quality framework

Judith Wilks, Gillian Kennedy, Neil Drew

University of Notre Dame, Australia

Katie Wilson

Victoria University of Wellington, New Zealand

In the Australian higher education sector, the challenges to successful engagement and retention experienced by Aboriginal and/or Torres Strait Islander students and communities are considerable. They persist despite many well-intentioned attempts to address this issue and to strengthen equity in participation in the sector. Implicated in this is the absence of a culturally-informed data quality framework for the sector, and the resulting persistence of associated issues such as confusion with data ownership; consistency; standards; usage; and storage. In this paper we argue it is essential that rigorous inquiry be carried out into the type and nature of data required or sought in the higher education sector on, for and with Aboriginal and Torres Strait Islander peoples. This inquiry must involve Aboriginal and Torres Strait Islander educators, researchers, evaluators and communities to bring into effect their aspirations for data sovereignty including stewardship and ownership of data, and for culturally beneficial outcomes relating to the use and application of data. It also mandates a collaborative approach with existing government and independent organisations, and Indigenous and non-Indigenous researchers from higher education institutions, working together towards the development and implementation of an agreed-upon and decolonised Indigenous data framework for the sector.

Keywords: Indigenous data quality framework; data sovereignty, self-determination, decolonisation

Introduction

Data and statistics on and for Aboriginal and Torres Strait Islander people have been collected, interpreted and used for countless and contested reasons, purposes and interests by government departments, independent groups and researchers, for decades (Jordan *et al.*, 2010; Yu, 2012; Biddle, 2014). Data and statistics are not value free, and

one cannot assume impartiality in Aboriginal and Torres Strait Islander data collection in Australia. Aboriginal and Torres Strait Islander values and perspectives have been excluded from data collected about them at the hands of dominant (Western) epistemologies and methodologies (Rigney, 1999; Martin, 2003; Smith 2012; Walter & Andersen, 2013; Bodkin-Andrews & Carlson, 2016). To remedy this, Aboriginal and Torres Strait Islander peoples,

and indigenous peoples globally, are asserting their rights to data sovereignty, particularly in the areas of population data, health, and wellbeing (Kukutai & Taylor, 2016a).

Indigenous scholars have challenged the colonising and deficit-based narratives that created and have continued to dominate discourses about Indigenous data (Kukutai & Taylor, 2016a). Walter (2016) in particular has named the racialised reality of data, perpetuated and promulgated by the five 'Ds': disparity, deprivation, disadvantage, dysfunction and difference. This has the effect of homogenising, pathologising, demonising and exoticising Indigenous peoples almost always to their disadvantage. She does not *ipso facto* reject data on inequalities per se but rather the data desert that surrounds Indigenous data from strengths-based approaches. 5D data serves to further marginalise Indigenous peoples, fostering not only marginalising discourses and exclusionary practices but also paternalistic practices that hark back to the days of 'saving' Indigenous people from themselves.

In the higher education context, data collection processes have developed over time with limited formal planning or evaluation processes in place (PhillipsKPA, 2012). This has important implications for the sector generally, but as we have found through recent research in Aboriginal and Torres Strait Islander contexts, cultural representativeness, accuracy, reliability and validity present particularly difficult challenges (Drew, Wilks, & Wilson, 2015; Drew, Wilks, Wilson, & Kennedy, 2016).

Driven by changing funding models that are impacting revenue and recruitment, Australian universities are 'at a crossroads' (Lacy *et al.*, 2017). Universities Australia's pre-budget submission (2017) stated that 'Australia's universities have faced an unprecedented level of uncertainty in recent years'. In a survey of top university leaders, Lacy *et al.* (2017) found amongst other issues that addressing the needs of society through outreach and engagement were important. Significantly however, although this comprehensive report signalled important changes in gender composition and internationalisation, it offered scant commentary on the nationally important issue of Aboriginal and Torres Strait Islander participation in higher education (Kinnane *et al.*, 2014). This underscores a cultural blind spot with respect to Aboriginal and Torres Strait Islander students and emphasises the importance of data informed policy development (Drew *et al.*, 2016).

The Universities Australia (2017) pre-budget submission also stated that any government proposals must achieve a number of objectives, the first of which they name as maintaining high levels of access and participation, whilst guaranteeing quality. The evidence from our earlier

paper (Drew *et al.*, 2016) and other sources (for example, Behrendt *et al.*, 2012; Kinnane *et al.*, 2014) is that universities have much to achieve in the area of Aboriginal and Torres Strait Islander student access and participation (notwithstanding the modest gains noted in the pre-budget report). Crucial to realising these aspirations is data informed decision making based on high quality data.

In this respect previously, (Drew *et al.*, 2016) we offered a point of provocation to challenge the dominant discursive agendas around the collection and use of data and statistics relating to Aboriginal and Torres Strait Islander peoples. In this current paper, we continue this conversation with the higher education sector by offering a way towards a decolonised data quality framework. In doing so, our ultimate aim is to contribute to the enhancement of successful transition, participation and retention experiences of Aboriginal and Torres Strait Islander higher education students.

The conversation is two-pronged: firstly, fundamental data quality issues exist within the higher education sector generally that require urgent attention (Kinnane *et al.*, 2014; PhillipsKPA, 2012; Department of Education and Training, 2013; Wilks & Wilson, 2015; Drew *et al.*, 2016). We assess elements of extant national and international data quality frameworks to inform our development of some next steps towards addressing these challenges. Secondly, and critically, we argue that the sector must strive towards the decolonisation of data and statistics to ensure that Aboriginal and Torres Strait Islander peoples are not only accurately represented in the sector, that the data and statistics about them are relevant to them, but that they are equal participants in the design, methods, interpretation and ownership of the data (Kukutai & Taylor, 2016a).

The First Nations Indigenous Governance Centre (FNIGC) promotes the OCAP principles of Ownership, Control, Access and Possession. These principles are the foundational bedrock for any consideration of data quality in Indigenous settings (First Nations Indigenous Governance Centre, 2016). Walter (2017) in a similar vein suggested the acronym PILAR, meaning that we should **P**rioritise Aboriginal data needs; **P**rotect the **I**ntegrity of Indigenous data; **S**upport Indigenous **L**eadership in the realm of Indigenous data; **B**e **A**ccountable for our practices in the Indigenous data space and recognise Indigenous **R**ights in relation to data. For example, Yap & Yu (2016) have utilised Taylor's (2008) 'recognition space' to ensure that data and statistics respect both Aboriginal and Torres Strait Islander world views and priorities, as well as government/sector planning and reporting needs.

What follows here is our contribution to this important conversation, outlining a rationale, key principles and recommendations for suggested next steps.

Background

This paper represents the culmination of a number of interlocking research projects. The research team comprises Indigenous and non-Indigenous researchers from three Australian universities and one New Zealand university who collaborated on a series of Office for Learning and Teaching funded research projects during the period 2011-16. Two key projects completed by the team during this period were: 'Can't be what you can't see': The transition of Aboriginal and Torres Strait Islander students into higher education (Kinnane *et al.*, 2014), and Developing a culturally appropriate data quality framework for Aboriginal and Torres Strait Islander higher education statistics (Drew *et al.*, 2015).

Our 2014 project surveyed twenty-six Australian universities and identified, among other factors, persistent challenges associated with data quality and availability in relation to Aboriginal and Torres Strait Islander students' higher education participation and pathways. This finding provided the impetus for the second project in which we examined these issues more closely, and subsequently developed a conceptual framework for identifying and understanding the impacts of matters of data quality (Drew *et al.*, 2016). Additionally, a second practice/practitioner oriented framework (data quality framework) was developed for the promotion of sector-wide guidelines associated with the collection, interpretation, use, and storage of quality data and statistics. Subsequent research has revealed new insights that have strengthened our understandings of the importance of Indigenous data sovereignty, and the need to ensure that a decolonised data quality framework for the higher education sector is articulated, designed and developed by Aboriginal and Torres Strait Islander peoples. The non-Indigenous research team members position themselves as 'non-Indigenous allies', ceding leadership and stewardship to their Indigenous colleagues.

This paper concludes by proposing some next steps towards the development of a national Indigenous data framework for the sector.

Project approach and methodology

Our collaboration between Indigenous and non-Indigenous researchers recognises Aboriginal and

Torres Strait Islander sovereignty, knowledges, voices and perspectives; and the importance of demonstrable community benefit flowing from research (Australian Institute of Aboriginal and Torres Strait Islander Studies, 2012; Moreton-Robinson & Walter, 2009; Nakata, 2007; National Health and Medical Research Council, 2007; Smith, 2012).

The data quality project was implemented in five phases over 2013-17. Phase 1 involved a desk audit of available literature on data quality issues. In Phase 2 a draft discussion paper was developed as a trigger document for an expert panel consultation comprising Indigenous and non-Indigenous researchers. Indigenous and non-Indigenous experts in the fields of statistics, demography, economics, and higher education administration identified in the desk audit were invited to critically evaluate the findings of the draft paper. Further to this, three Indigenous and four non-Indigenous senior educators were interviewed about the key issues of data quality and the key challenges facing the higher education sector in this field. A saturation search strategy guided the recruitment of participants until no further substantive issues emerged.

In Phase 3, a revised discussion paper was presented to Aboriginal and Torres Strait Islander higher education sector representatives and other stakeholders for comment, discussion and revision. In Phase 4, following publication of the report by the Office for Learning and Teaching in 2015, the Discussion Paper, including a proposed draft data quality conceptual model, was made available for dissemination and feedback throughout the sector (Drew *et al.*, 2015). The current phase, Phase 5, involves wider dissemination activities, including a series of publications. The first, Drew *et al.* (2016), outlined the research findings using a conceptual framework for understanding the data quality challenges that were identified. This paper comprises the second publication in the series.

Rationale for a data quality framework

In previous publications (Drew *et al.*, 2015; Drew *et al.*, 2016) we drew attention to the lack of shared standards and understanding of data and subsequently of data elements in higher education data sets. We identified issues associated with understanding data needs, the lack of data consistency, and inadequate data definitions. Clarity and sector-wide agreement around these elements is necessary in order that a clear, culturally informed and culturally beneficial rationale is developed to lay the foundations for a national framework for Indigenous higher education data.

In 2012, the Department of Education and Training (the Department) commissioned a review of reporting requirements and data collection in the higher education sector (PhillipsKPA, 2012; Department of Education and Training, 2013). The Department responded to the PhillipsKPA review, accepting the majority of the 27 recommendations. At the time of writing it is understood that the Department is finalising work on a discussion paper relating to a proposed redevelopment and audit of the Higher Education Information Management System (HEIMS) (personal communication, 2017).

Despite the Department's acknowledgement of these fundamental challenges, and the subsequent efforts by the Higher Education Data Committee (HEDC) in 2017, towards improving higher education data collections, these undertakings do not specifically address Aboriginal and Torres Strait Islander data and statistics in the higher education reporting landscape. We make the case here that in order to improve higher education access, retention and outcomes for Aboriginal and/or Torres Strait Islander students in higher education, there is a need to grapple with significant data quality matters directly relating to this cohort, as highlighted in the Review of higher education access and outcomes for Aboriginal and Torres Strait Islander people (Behrendt *et al.*, 2012), which stated:

An authentic commitment by all relevant actors to Indigenous stewardship and ownership of data in the spirit of Indigenous data sovereignty will be challenging for many institutional leaders

While a substantial amount of high-quality data is already collected from universities on a variety of outcome measures, data is not collected with a strategic focus on the specific outcomes for Aboriginal and Torres Strait Islander people. Most data that relates to outcomes for Aboriginal and Torres Strait Islander students is collected as part of a broader data collection process in which respondents or students are simply recorded as having identified themselves as being of Aboriginal or Torres Strait Islander origin. This collection approach may mean under-reporting by Aboriginal and Torres Strait Islander students, particularly if they do not see any relevant purpose to the data collection. (p. 168).

Indeed, Trewin (2003) pointed out that higher education statistics come from a diverse range of agencies and require improved integration, comparability and consistency (p. iv), and currently there is not even agreement between the responsible data gathering agencies on the number of Aboriginal and Torres Strait Islander students undertaking higher education. At present there is no clear evidence of standards or guidelines for the collection, interpretation

or usage of data on, for or with Aboriginal and/or Torres Strait Islander higher education students within data collection processes, nor for its storage in the main information repositories.

The dominance of Western knowledge systems and methodologies underpinning data collection has meant that Aboriginal and Torres Strait Islander values and perspectives have been excluded (Smith, 2012), and the resulting statistics are either misleading (Taylor, 2011), irrelevant for Aboriginal and Torres Strait Islander purposes (Yap & Yu, 2016) and/or inaccurate. For example, as Rowse (2009) pointed out, in the political discourse of

statistics there are differences between using 'population' as a measure and 'people' with a shared culture and measured within a culturally specific framework. In the higher education context, this may be illustrated by the example of commonly

touted factors such as 'retention', 'completion' and 'success' at university.

It has been suggested for example that such indicators might more appropriately be measured by way of 'cyclical rather than linear' (Behrendt *et al.*, 2012, p. 87) experiences for Aboriginal and/or Torres Strait Islander students in higher education. The reasoning behind this is that these students are 'more likely than others to move in and out of programs over time according to a range of personal and environmental circumstances' (Day *et al.*, 2015, p. 508; see also Walker, 2000; Behrendt *et al.*, 2012). Such an approach would also contribute to the reframing of data towards student achievement (Walker, 2000), as opposed to the more common, '5D data of disparity, deprivation, disadvantage, dysfunction and difference' (Walter, 2016, p. 80).

A compelling rationale for the development of culturally beneficial data/statistical quality frameworks is provided by Statistics New Zealand in its Māori Statistics Framework (2002). Its authors commented that: 'up to ...1961... [many] Māori were oblivious to official statistics and the impact they had on their lives' (Statistics New Zealand, 2002, p. 3). Community concerns were raised when there was a realisation of the intimate connection between the statistics that were gathered about them and subsequent government decisions. Moreover, it became clear that governments had 'their own reasons for collecting these statistics' (Statistics New Zealand, 2002, p. 3). For Māori, many issues discussed above were at play, including the

failure to include Māori worldviews and beliefs in the collection, storage and applications of data, culminating in an overarching belief that the prevailing practices were not relevant to Māori.

Data collection is implicated by the political and racial assumptions and values of those gathering data and framing the questions (Walter, 2010), and reflects the sociocultural, historical and political constructions that serve particular agendas. The instilling of culturally competent, data informed and responsive policies, practices and procedures across the sector is a critical step towards the achievement of this goal. We have previously argued (Drew *et al.*, 2016) that it will be necessary for non-Indigenous and Indigenous participants in the sector to (re)position themselves in relation to a clear reflective 'dual lens' (Drew, Adams, & Walker, 2010) of whiteness and Indigenous Terms of Reference (Oxenham, 2000). The application of a dual lens will promote simultaneous reflection on the implications of white privilege (and the associated colonising practices) and Indigenous worldviews for understanding this contested and complex domain (Nakata, 2007; Walter, 2010). Below we outline what this might look like in the context of higher education practices.

Summary of data quality issues

Our conceptual framework (Drew *et al.*, 2015; Drew *et al.*, 2016) for disaggregating data challenges into upstream, midstream and downstream (summarised briefly below; see Table 1) provided a typology to assist in understanding and responding at the appropriate level of analysis, or site of intervention, towards the achievement of the goal identified above. A range of actors implicated at different levels is identified, but together they need to develop a coherent, sophisticated and critical statistical literacy culminating in a capacity to create a 'common language' at all levels (Throgmorton, 2000).

The upstream level will require the demonstration of leadership at the international, national and executive institutional levels, in areas of vitally important cultural commitments regarding the use and abuse of Aboriginal and Torres Strait Islander data; of what needs to be known and why, and of shared agreement across jurisdictions regarding the nature and scope of a shared critical statistical literacy.

At the midstream level is engagement with Aboriginal and Torres Strait Islander communities. A lack of purposeful commitment and culturally respectful motivation from those with the power and agency upstream has been identified as a problem by many Aboriginal and Torres

Strait Islander observers. An authentic commitment by all relevant actors to Indigenous stewardship and ownership of data in the spirit of Indigenous data sovereignty will be challenging for many institutional leaders (Walter, 2016). The power that control of the data endows, and where this power might reside, will not be easily relinquished by some. Yet it is crucial that this happens in order that a culturally responsive and safe dialogue in the intercultural space takes place. Non-Indigenous allies must also be active advocates for this important eventuality.

Lovett (2016) recognised the disempowering experience of being an Aboriginal and/or Torres Strait Islander person acting on advisory boards such as National Aboriginal and Torres Strait Islander Health Data (NAGATISHID) with the power only to advise not to direct. Walter (personal communication, 11-12 October, 2017) went further to advocate for active resistance in the form of withdrawal of service for such advisory boards, to become 'data disobedient'. This is a fundamentally important governance issue. At the midstream level the concepts of intercultural space and reflective practices through the dual lens identified above, are important for developing authentic and trusting relationships. Equally important is building the statistical capacity of Aboriginal and Torres Strait Islander people (Lovett, 2016).

Downstream is the engine room for data quality. That engine room can only function effectively with the right types of guidance and support from the system that developed and engaged it. The pragmatics of data quality including access, timeliness, reliability, validity, sampling data security and the balance of quantitative and qualitative methods, cross sectional and longitudinal studies can only be assured by the right signals being sent from the midstream and upstream agents to those enacting policy and practice at the downstream level.

As noted, this conceptual model provided a reflective tool for universities and other higher education institutions to interrogate their practices as a precursor to considering the practicalities of developing and adopting a decolonised data quality framework. A decolonised data quality framework should honour the OCAP principles for data sovereignty outlined by the FNIGC lest the dominant discourse remains the status quo.

Models to inform the development of a decolonised data quality framework

To address some fundamental data quality issues within the higher education sector, we take inspiration from both domestic and international models for improving

data quality, and briefly review these for relevance to an Indigenous data framework. The Australian Bureau of Statistics (2011) data quality framework draws on the seven dimensions applied by Statistics Canada's quality assurance framework, outlined below:

Institutional environment: This dimension refers to the trustworthiness and credibility of the institution providing the data. As consumers, we rely on the credibility and trust in the sources of the data, which can be challenged in two key ways: inappropriate methodology and suspicion of political biases of the institution (Trewin, 2002).

Relevance: How well do the data meet the needs of the end user?

Timeliness: What is the time lag between the data reference point (the time the data refers to) and the data availability?

Accuracy: How well does the data measure what it purports to measure? This is a variant of validity.

Coherence: Are the data internally consistent and comparable across other sources of data?

Interpretability: What information is available to provide insight into the data?

Accessibility: There are two components to accessibility. The first is how easily it can be obtained and the second is the suitability of the form in which it may be obtained.

(Australian Bureau of Statistics, 2011; Allen, 2002; Gilbert, 2010)

Upon the establishment of the HEDC in 2012 the Higher Education Data Committee Terms of Reference (Department of Education, 2017) outlined eight principles of the collection and dissemination of data. These were: fit for purpose; privacy; consistency; auditability; transparency; timeliness; validity and reliability; and, efficiency and cost-effectiveness.

It is noteworthy that these types of quality indicators are subject to contextual factors, and some may be more important (or impactful) than others, depending on the circumstance, data type and proposed use. We propose that they require integration with more finely-grained, responsive, flexible, and culturally discursive elements identified and defined by Aboriginal and Torres Strait Islander communities. Additionally, and in the spirit of a commitment to data sovereignty, these guiding principles should be further interrogated to ensure they honour the principles of OCAP and PILAR.

International models of data collection exist in other countries with indigenous populations that appear to be on a trajectory towards data sovereignty. As mentioned above,

the Māori Statistical framework (Statistics New Zealand, 2002) is a multi-dimensional framework oriented towards Māori wellbeing and development and incorporates Māori worldviews. Although gaps do exist (Kukutai & Walter, 2015; Bishop, 2016), it is often quoted as a model system for indigenous statistics because it engages Māori in identifying Māori needs for statistics, and elaborates a way to meet such needs. It combines different levels and models into one framework (Dandenau, 2008; Rowse, 2009). The framework identified 'areas of concern' such as Māori language, Māori knowledge, modern knowledge and skills; 'goal dimensions' such as empowerment and enablement; and related 'measurement dimensions' for each goal (Wereta & Bishop, 2006, p. 9). However, existing within a dominant system, this framework does not meet all data needs of Māori iwi (tribes). In response, Te Mana Raraunga - Māori Data Sovereignty Network - (Te Mana Raraunga. (n.d.)) established in 2015, actively positions Māori rights and interests in Māori data, recognising data as a treasure (taonga) and advocating for Māori governance, quality and integrity of Māori data and its collection (Kukutai & Taylor, 2016b).

Other key guiding bodies include the United Nations Permanent Forum on Indigenous Issues, in particular its wellbeing indicators framework (Stankovitch, 2008), significant because it was driven by Indigenous peoples and foregrounds Indigenous priorities (Jordan, *et al.*, 2010); and the World Indigenous Nations Higher Education Consortium (WINHEC) (2016). Established in 2002, WINHEC provides an important vision which can be used to inform a data quality framework for Aboriginal and Torres Strait Islander higher education statistics. This vision and its accompanying goals are strongly supportive of recognising and valuing cultural dimensions as key elements to academic success and indigenous involvement, in the agreeing of definitions, interpretations and affirmations of success, and what it means to indigenous peoples (personal communication, 13 October 2014). WINHEC's vision is expressed as follows:

We gather as Indigenous Peoples of our respective nations recognising and reaffirming the educational rights of all Indigenous Peoples. In pursuit of this we share a collective goal of Indigenous Peoples of the world united in the collective synergy of self-determination through control of higher education. In doing so we have the common objective of being committed to building partnerships that restore and retain indigenous spirituality, cultures and languages, homelands, social systems, economic systems and self-determination. (WINHEC, 2016).

WINHEC's goals outlined in the following section, provide important foundations for a data quality framework. Likewise, principles developed for the National Advisory Group on Aboriginal and Torres Strait Islander Health Information and Data (NAGATSIHD, 2006) also might offer useful guidance. In particular:

Principle 1: The management of health-related information about Aboriginal and Torres Strait Islander persons must be ethical, meaningful, and support improved health and better planning and delivery of services.

Principle 2: The analysis, interpretation and reporting of Aboriginal and Torres Strait Islander health-related information should, where feasible, occur collaboratively with Aboriginal and Torres Strait Islander people.

In taking into account the strengths, principles and constitutive elements of the models and frameworks of relevance outlined above, we consider that an Indigenous data quality framework should provide (at a minimum), the basis for a shared, culturally beneficial, critical statistical literacy to bridge the gap between diverse and often diverging communities of interest (professionals in the data and statistics field; bureaucrats and administrators within government, the sector and the community; higher education leadership and the lay community) (Drew *et al.*, 2016). It would also involve the provision of an explicit accountability mechanism for dealing with developing data/statistical literacy and National Standards and KPIs. In other words, a data quality framework should aim to find the recognition space (Taylor, 2008) within the higher education sector.

What might a decolonised data quality framework look like in the Australian higher education sector?

Some guiding principles therefore emerge from the above review towards the development of a decolonised Indigenous data quality framework. Inspired by these principles, and informed by our consultations with senior Indigenous and non-Indigenous academics and bureaucrats, researchers, and other higher education stakeholders, in this section we propose elements for such a framework for the higher education sector. We also provide some suggestions for how to address the data quality challenges (the upstream, midstream and downstream elements) identified in our conceptual framework (Drew *et al.*, 2016).

What follows refers to both the generic and culture-specific challenges for the higher education sector. A

decolonised data quality framework will require an authentic sense of data stewardship and ownership for Aboriginal and Torres Strait Islander peoples in moving forward. We do not propose a solution, but rather considerations for next steps.

Step one: In relation to data quality, recognise the importance of Indigenous terms of reference, including the emergent aspirations and principles of data sovereignty.

Any attempt to move towards improved data quality in Aboriginal and Torres Strait Islander higher education contexts must recognise, and be underpinned by, the United Nations Declaration on the Rights of Indigenous Peoples (United Nations, 2007), specifically:

Article 3: Indigenous peoples have the right to self-determination. By virtue of that right they freely determine their political status and freely pursue their economic, social and cultural development.

Article 15(1): Indigenous peoples have the right to the dignity and diversity of their cultures, traditions, histories and aspirations which shall be appropriately reflected in education and public information.

Article 23: Indigenous peoples have the right to determine and develop priorities and strategies for exercising their right to development. In particular, Indigenous peoples have the right to be actively involved in developing and determining health, housing and other economic and social programs affecting them and, as far as possible, to administer such programs through their own institutions.

Additionally, WINHEC sets out nine goals for higher education which provide a critical foundation upon which to build a decolonised data quality framework. Among other aspirations, these goals are aimed at enabling Indigenous peoples to:

- be in control of their own education for long term success;
- accelerate the articulation of Indigenous epistemology (ways of knowing, education, philosophy and research); and
- create an accreditation body for Indigenous education initiatives and systems that identify common criteria, practices and principles by which Indigenous Peoples live (WINHEC, 2014).

Step two: Define the recognition space and identify indicators.

While ground-breaking work exploring the recognition space has occurred in relation to demographics and wellbeing (Yap & Yu, 2016; Kukutai & Walter, 2015), this is

Table 1: Summary of Indigenous data quality challenges in higher education

'Upstream' practices promote data consistency	<ul style="list-style-type: none"> • cultural dimensions of statistical literacy • sector wide reporting standards • clarity of management structures • shared statistical literacy • student self-identification as Aboriginal and/or Torres Strait Islander • Aboriginal, Torres Strait Islander data needs, peer review • respect for cultural data restrictions
'Midstream' practices promote data integrity, completeness cultural appropriateness	<ul style="list-style-type: none"> • train community in data collection • expand HEIMS metadata and Indigenous elements • culturally appropriate data collection methods • impact of self-identification practices on data • community participate in data analysis, measurement • Aboriginal, Torres Strait Islander communities identify data • develop appropriate levels of measurement
'Downstream' practices promote accurate, accessible data	<ul style="list-style-type: none"> • data availability, audience, timeliness • rigorous data standards • culturally respectful protocols for data ownership, stewardship • data determinism • data collection over time, cross sectional, longitudinal

unexplored territory in higher education. The recognition space is the negotiated space between Aboriginal and Torres Strait Islander world views and priorities and government/sector reporting requirements, resulting in social indicators that reflect shared understandings (Taylor, 2008). As noted by Walter (2016):

Expanding the 'recognition space' between Indigenous and non-Indigenous understandings allows us to speak back to the state in the language of statistical evidence that they both understand and culturally respect, reframing the narratives about us (p. 92).

The recognition space allows Aboriginal and Torres Strait Islander peoples to become the creators, interpreters, users and importantly stewards and owners of data, as opposed to simply subjects of data, which has been the norm for Aboriginal and Torres Strait Islander peoples (Biddle, 2014, Kukutai & Taylor, 2016). This in turn brings a demonstrable community benefit, reflecting a relational, rather than hierarchical approach (Andersen *et al.*, 2008), and recognises the importance of trust and reciprocity.

Therefore, one of the key first steps on the road to the decolonisation of data and statistics is for Aboriginal and Torres Strait Islander peoples to identify priorities and measures against which data can be collected, analysed and ultimately used by both the sector and Aboriginal and Torres Strait Islander peoples. This is the fundamental premise of an authentic data sovereignty regime. Unlike much data collected about Aboriginal and Torres Strait Islander peoples, which Walter (2010) has described as the '...statistical portrayal of Indigenous dysfunction'

(p. 45), a data quality framework in the recognition space would have the capacity to reflect a strengths-based as opposed to a 5D's perspective. Another important element of the data regime is to recognise that 'data' is both qualitative and quantitative and both must be considered valid and equally important data sources.

Step three: Develop processes to ensure cultural appropriateness, community responsiveness, quality, and equity in data collection practices in higher education.

Below we make some recommendations as to how issues associated with specific data quality processes identified above and also in our first paper (Drew *et al.*, 2016), might

be addressed. Collectively, the elements outlined below, and summarised in Table 1, might not only improve higher education data collection, storage and usage practices, but also ultimately contribute to the overall goal of better outcomes for Aboriginal and/or Torres Strait Islander students regarding access, participation and retention in higher education.

Addressing 'Upstream' challenges

Recommended elements in higher education governance processes to promote data consistency:

- Recognition of the cultural dimensions of statistical literacy – cultural knowledge, worldviews, customs and practices, and consent considerations.
- Development of agreed-upon, sector wide standards of reporting, definitions and classification systems.
- Clarity of management structures relating to the collection, storage, analysis, monitoring communication and review of data.
- Professional development of governance personnel to promote a shared statistical literacy across the sector.
- Student self-identification as Aboriginal and/or Torres Strait Islander – understanding that this can vary across time, locations and contexts and that the dynamics of students' self-identification behaviours impact on data quality and data collection.
- Indigenous peer review of technical specifications.
- Identification of data by Aboriginal and Torres Strait Islander communities that needs to be restricted, repatriated, or not be collected at all (Smith, 2016).

Addressing 'Midstream' challenges

Recommended elements to promote the integrity, completeness and cultural appropriateness of data:

- Train local community members to gather data according to high standards of research practice (Taylor *et al.*, 2012).
- Promote understanding of the impacts of self-identification practices on data.
- Promote the role of the sector in the training and support of Indigenous researchers and evaluators (Biddle, 2014; Lovett, 2016; Rodriguez-Lonebear, 2016)
- Develop culturally appropriate data collection methods – collect statistics through a 'dual lens'.
- Improve the capacity of the sector to, among other things, evaluate program performance, link data, produce quality comparative data, and undertake benchmarking.
- Further expansion of metadata and Indigenous elements of the Higher Education Information Management System (HEIMS) data elements dictionary to capture the needs and perspectives of Aboriginal and Torres Strait Islander peoples.
- Identify appropriate levels of measurement: e.g. individual vs group vs sector.

Addressing 'Downstream' challenges

Recommended elements to promote more accurate and accessible data:

- Data availability: consideration of online access: When (timeliness)? How? For whom?
- Apply rigorous data quality standards to data collection and analysis, including: data reliability and validity; sampling; sample size; reliability and validity; don't collect data that are not valid or reliable for Aboriginal and Torres Strait Islander peoples.
- Develop culturally respectful protocols for data storage and security, including the ownership and stewardship of data.
- Develop a strategic, agreed-upon and informed sector-wide approach to data collection over time, including linking of cross-sectional data and collection of longitudinal data.

Conclusion

Notwithstanding the ground-breaking work by Aboriginal and Torres Strait Islander researchers in the data sovereignty space (notably, Maggie Walter, Ray Lovett, Gawain Bodkin-Andrews, Eunice Yu), and despite recent initiatives to improve data and statistics across the education sector

(Australian Institute of Health & Welfare, 2015; Department of Education, 2015; National Centre for Student Equity in Higher Education (NCSEHE), 2016; Pitman & Koshy, 2015), Aboriginal and Torres Strait Islander values and perspectives remain largely absent in Australian higher education, making the goal of Indigenous data sovereignty particularly challenging. The responsibility for embarking on this challenge is two-pronged: Rodriguez-Lonebear (2016), writing in the US national statistics context emphasises that on the one hand, 'it involves tribes exercising their sovereignty by developing tribal data sources; on the other, it involves improved collection of official statistics maximally useful to tribes' (p. 261). This has relevance to higher education in Australia.

As we noted in our first paper (Drew *et al.*, 2015) statistical literacy should include the capacity to understand the motivations behind the use and abuse of statistical data and to resist promulgation of deficit narratives (civic statistical literacy), and to appreciate the importance of Indigenous knowledges and perspectives on data use and abuse (cultural statistical literacy). From the perspective of the higher education sector, Indigenous data sovereignty involves attention at all levels, namely, organisational culture change, systemic change, operational change, and staff development and training. It will also require sound and regular monitoring and evaluation of data quality.

In a practical sense the process may begin by ensuring that data are more visible to Aboriginal and Torres Strait Islander communities. As Jansen (2016), writing from the Māori experience of the New Zealand/Aotearoa health sector suggests, indigenous data sovereignty seems to 'move up a hierarchy from data visibility and data accessibility to data sharing and data control' (p. 209).

Finally, a great deal of the solution towards decolonising data for the higher education sector resides in relationship building. Above all, we propose an approach whereby the sector engages with Aboriginal and Torres Strait Islander communities in conversations towards embedding the principles of data sovereignty in data frameworks. This involves Indigenous people and non-Indigenous allies coming together in an intercultural space to collectively honour the importance of ownership and stewardship of the data that impacts Indigenous lives and livelihoods. We regard this as a non-negotiable launching pad fundamental to shifting the narrative from deficit to strengths based understandings. In doing so a catalyst for positive action will be created to assist the sector to keep moving towards the achievement of equitable outcomes for Aboriginal and Torres Strait Islander students and communities in terms of participation, retention and success in higher education.

Judith Wilks is Adjunct Associate Professor, Nulungu Research Institute, The University of Notre Dame, Australia; and Adjunct Associate Professor, School of Education and Member of Emeritus Faculty, Southern Cross University, Australia.
Contact: Judith.wilks@scu.edu.au

Gillian Kennedy is Coordinator of Aboriginal Studies at The University of Notre Dame Australia, Broome Campus.

Neil Drew is Adjunct Professor, Nulungu Research Institute, The University of Notre Dame, Australia; and Professor/Director, Australian Indigenous HealthInfonet, Edith Cowan University, Australia.

Katie Wilson is a researcher and librarian at Victoria University of Wellington, New Zealand.

References

- Allen, B. (2002). *Qualifying quality: A framework for supporting quality-informed decisions*. Paper presented at the Proceedings of the Statistics Canada Symposium. http://unstats.un.org/unsd/dnss/docs-nqaf/ABS_Reference_Papers.pdf
- Andersen, C., Bunda, T., & Walter, M. (2008). Indigenous higher education: The role of universities in releasing the potential. *Australian Journal of Indigenous Education, 37*, 1-8.
- Australian Bureau of Statistics. (2011). Data quality framework. Retrieved from <http://www.abs.gov.au/websitedbs/D3310114.nsf/home/Quality:+The+ABS+Data+Quality+Framework>
- Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS). (2012). *Guidelines for Ethical Research in Australian Indigenous Studies* (GERAIS). 2nd ed. Retrieved from <http://www.aiatsis.gov.au/research/docs/GERAIS.pdf>
- Australian Institute of Health & Welfare. (2015). Development of a national education and training data standards strategy and implementation plan. Retrieved from <https://www.aihw.gov.au/getmedia/04f99910-be3d-4ae9-89ec-e6b18587922e/18693.pdf.aspx?inline=true>
- Behrendt, L., Larkin, S., Griew, R., & Kelly, P. (2012). *Review of higher education access and outcomes for Aboriginal and Torres Strait Islander people: Final report*. Canberra, Australia: Department of Industry, Innovation, Science, Research and Tertiary Education.
- Biddle, N. (2014). *Data about and for Aboriginal and Torres Strait Islander Australians: Issues paper no. 10*, prepared for the Closing the Gap Clearinghouse. Retrieved from <https://www.aihw.gov.au/reports/indigenous-australians/data-about-and-for-aboriginal-and-torres-strait-is/content/table-of-contents>
- Bishop, D. (2016). Indigenous peoples and the official statistics system in Aotearoa/New Zealand. In T. Kukutai & J. Taylor (Eds.), *Indigenous data sovereignty: Toward an agenda* (pp. 291-306). Canberra, Australia: ANU Press. doi:10.22459/CAEPR38.11.2016
- Bodkin-Andrews, G., & Carlson, B. (2016). The legacy of racism and Indigenous Australian identity within education. *Race, Ethnicity and Education, 19*(4), 784-807.
- Dandenau, S. (2008). Background paper on indicator frameworks: Their different types, levels, and applicability. In M. Stankovitch (Ed.), *Indicators relevant for Indigenous peoples: A resource book* (pp. 219-230). Baguio City, Philippines: Tebtebba Foundation.
- Day, A., Nakata, V., Nakata, M., & Martin, G. (2015). Indigenous students' persistence in higher education in Australia: Contextualising models of change from psychology to understand and aid students' practices at a cultural interface. *Higher Education Research & Development, 34*(3), 501-512. doi:10.1080/07294360.2014.973379
- Department of Education and Training. (2013). Government response to the review of reporting requirements for universities. Retrieved from <https://www.education.gov.au/government-response-review-reporting-requirements-universities>
- Department of Education. (2017). *Higher Education Data Committee terms of reference*. Retrieved from <https://docs.education.gov.au/node/36653>
- Drew, N., Adams, Y., & Walker, R. (2010). Issues in mental health assessment with Indigenous Australians. In N. Purdie, P. Dudgeon & R. Walker (Eds.), *Working together: Aboriginal and Torres Strait Islander mental health and wellbeing principles and practice* (pp. 191-201). Canberra, Australia: Department of Health and Ageing.
- Drew, N., Wilks, J., & Wilson, K. (2015). Developing a culturally appropriate data quality framework for Aboriginal and Torres Strait Islander higher education statistics: Discussion paper. Retrieved from <http://www.nd.edu.au/research/data-quality-framework>
- Drew, N., Wilks, J., Wilson, K., & Kennedy, G. (2016). Standing up to be counted: Data quality challenges in Aboriginal and Torres Strait Islander higher education statistics. *Australian Aboriginal Studies, 2016*(2), 104-120.
- First Nations Information Governance Centre (FNIGC). (2016). Pathways to First Nations data and information sovereignty. In T. Kukutai & J. Taylor (Eds.), *Indigenous data sovereignty: Toward an agenda*. (pp. 139-155). Canberra, Australia: ANU Press.
- Gilbert, N. (2010). ABS Data quality framework: Linking quality assessment to development of performance indicators. Paper presented at the European Conference of Quality in Official Statistics.
- Jansen, R. (2016). Indigenous data sovereignty: A Māori health perspective. In T. Kukutai & J. Taylor (Eds.), *Indigenous data sovereignty: Toward an agenda*. (pp. 193-212). Canberra, Australia: ANU Press.
- Jordan, K., Bulloch, H., & Buchanan, G. (2010). Statistical equality and cultural difference in Indigenous wellbeing frameworks: A new expression of an enduring debate. *Australian Journal of Social Issues, 45*(3), 333-362.
- Kinnane, S., Wilks, J., Wilson, K., Hughes, T., & Thomas, S. (2014). 'Can't be what you can't see': The transition of Aboriginal and Torres Strait Islander students into higher education. Retrieved from <https://www.nd.edu.au/research/olt-aboriginal-and-torres-strait-islander-transition/home>
- Kukutai, T., & Taylor, J. (Eds.). (2016a). *Indigenous data sovereignty: Toward an agenda*. Canberra, Australia: ANU Press. doi:10.22459/CAEPR38.11.2016
- Kukutai, T., & Taylor, J. (2016b). Data sovereignty for indigenous peoples: Current practice and future needs. In T. Kukutai & J. Taylor (Eds.), *Indigenous data sovereignty: Toward an agenda* (pp. 1-22). Canberra, Australia: ANU Press.
- Kukutai, T., & Walter, M. (2015). Recognition and indigenizing official statistics: Reflections from Aotearoa New Zealand and Australia. *Statistical Journal of the IAO, 31*, 317-326.
- Lacy, W. B., Croucher, G., Brett, A., & Mueller, R. (2017). Australian universities at a crossroads. Melbourne, Australia: Centre for the Study of Higher Education, Center for Studies in Higher Education University of California, Berkeley. Retrieved from <http://melbourne-eshe.unimelb.edu.au/resources/tertiary-education-policy/policy-landscape/australian-universities-at-a-crossroads>
- Lovett, R. (2016). Aboriginal and Torres Strait Islander community wellbeing: Identified needs for statistical capacity. In T. Kukutai & J. Taylor (Eds.), *Indigenous data sovereignty: Toward an agenda*. (pp. 213-231). Canberra, Australia: ANU Press.
- Martin, K. (2003). Ways of knowing, ways of being, and ways of doing: A theoretical framework and methods for indigenous research and indigenist

research. *Journal of Australian Studies*, 76, 203-214.

Moreton-Robinson, A., & Walter, M. (2009). Indigenous methodologies in social research. In M. Walter (Ed.), *Social research methods: An Australian perspective* (2nd ed., pp. 1-18). Melbourne, Australia: Oxford University Press.

NAGATSIHID. (2006). *National Aboriginal and Torres Strait Islander health data principles*. Retrieved from <http://webarchive.nla.gov.au/gov/20110406105438/https://www.aihw.gov.au/nagatsihid>

Nakata, M. (2007). The cultural interface. *Australian Journal of Indigenous Education*, 36(Supplementary), 7-14.

National Centre for Student Equity in Higher Education (NCSEHE). (2016). Facilitating student equity in higher education. Retrieved from <https://www.ncsehe.edu.au/publications/facilitating-student-equity-in-australian-higher-education/>

National Health and Medical Research Council (NHMRC). (2007). National statement on ethical conduct in human research. Retrieved from http://www.nhmrc.gov.au/_files_nhmrc/file/publications/synopses/e72-jul09.pdf

Oxenham, D. (2000). Aboriginal terms of reference. Aboriginal terms of reference. In P. Dudgeon, D. Garvey & H. Pickett (Eds.), *Working with Indigenous Australians: A handbook for psychologists*. (pp. 109-125). Perth, Australia: Gunada Press.

PhillipsKPA Pty Ltd. (2012). *Review of reporting requirements for universities: Final report*. Retrieved from <http://www.lhmartinstitute.edu.au/news-updates/latest-news-updates/248-review-of-universities-reporting-requirements-recommends-move-to-a-national-higher-education-inform>

Pitman, T., & Koshy, P. (2015). A framework for measuring equity performance in Australian higher education: Forward plan for data and statistics identification and enhancement. National Centre for Student Equity in Higher Education, Curtin University. Retrieved from https://www.ncsehe.edu.au/wp-content/uploads/2016/07/EPF_Forward_Plan_Final.pdf

Rigney, L-I. (1999). Internationalization of an indigenous anticolonial cultural critique of research methodologies: A guide to indigenist research methodology and its principles. *Wicazo Sa Review*, 14(2): 109-121.

Rodriguez-Lonebear, D. (2016). Building a data revolution in Indian country. In T. Kukutai & J. Taylor (Eds.), *Indigenous data sovereignty: Toward an agenda* (pp. 253-272). Canberra, Australia: ANU Press.

Rowse, T. (2009). Official statistics and the contemporary politics of indigeneity. *Australian Journal of Political Science*, 44(2): 193-211.

Smith, D. E. (2016). Governing data and data for governance: the everyday practice of Indigenous sovereignty. In T. Kukutai & J. Taylor (Eds.), *Indigenous data sovereignty: Toward an agenda* (pp. 117-135). Canberra, Australia: ANU Press.

Smith, L. T. (2012). *Decolonizing methodologies: Research and indigenous peoples* (2nd ed.). London, UK: Zed Books.

Stankovitch, M. (Ed.) (2008). *Indicators relevant for indigenous peoples: A resource book*. Baguio City, Philippines: Tebtebba Foundation: Indigenous Peoples' International Centre for Policy Research and Education.

Statistics New Zealand. (2002). Towards a Māori Statistical Framework: a discussion document. Wellington, New Zealand: Statistics New Zealand. Retrieved from <http://www.stats.govt.nz/reports/developments/towards-a-maori-stats-framework.aspx>

Taylor, J. (2008). Indigenous peoples and indicators of wellbeing: Australian perspectives on United Nations global frameworks. *Social Indicators Research*, 87(1):111-26.

Taylor, J. (2011). Postcolonial transformation of the Australian Indigenous population. *Geographical Research*, 49(3), 286-300. doi:10.1111/j.1745-5871.2011.00698.x

Taylor, J., Doran, B., Parriman, M., & Yu, E. (2012). Statistics for community governance: The Yawuru Indigenous population survey of Broome. Retrieved from <http://caepn.anu.edu.au/publications/working.php>

Te Mana Raraunga. (n.d.). Te Mana Raraunga – Māori Data Sovereignty Network. Retrieved from <https://www.temanararaunga.maori.nz/>

Throgmorton, J. A. (2000). On the virtues of skilful meandering. *Journal of the American Planning Association*, 66(4): 367-383.

Trewin, D. (2002). The importance of a quality culture. *Survey Methodology*, 28(2), 125-133.

Trewin, D. (2003). *Measuring learning in Australia: A framework for education and training Statistics: ABS Catalogue no. 4213.0*. Canberra, ACT: Australian Bureau of Statistics.

Trewin, D., & Madden, R. (2003). *The health and welfare of Australia's Aboriginal and Torres Strait Islander peoples, 2003*. Belconnen, Australia: Australian Bureau of Statistics.

United Nations. (2007). Declaration on the Rights of Indigenous Peoples. Retrieved from <https://www.un.org/development/desa/indigenouspeoples/declaration-on-the-rights-of-indigenous-peoples.html>

Universities Australia. (2017). 2017-2018 pre-budget submission. Retrieved from <https://www.universitiesaustralia.edu.au/Media-and-Events/submissions-and-reports/2017-18-Pre-budget-submission>

Walker, R. (2000). Indigenous performance in Western Australian universities: Reframing retention and success. Department of Education, Training and Youth Affairs, Evaluations and Investigations Program, Higher Education Division. Retrieved from <http://www.voced.edu.au/content/ngv%3A61280>

Walter, M. (2010). The politics of the data: How the Australian statistical indigene is constructed. *International Journal of Critical Indigenous Studies*, 3(2): 45-56.

Walter, M. (2016). Data politics and Indigenous representation in Australian statistics. In T. Kukutai & J. Taylor (Eds.), *Indigenous data sovereignty: Toward an agenda* (pp. 79-87). Canberra, Australia: ANU Press. doi:10.22459/CAEPR38.11.2016

Walter, M. (2017). Growing data sovereignty through data governance. Presentation at the Indigenous Data Sovereignty Symposium, University of Melbourne, October 11-12, 2017.

Walter, M., & Andersen, C. (2013). *Indigenous statistics: A quantitative research methodology*. Walnut Creek, CA: Left Coast Press.

Wereta, W., & Bishop, D. (2006). Towards a Maori statistics framework. Paper presented at the Meeting on indigenous peoples and indicators of well-being: Aboriginal Policy Research Conference, Ottawa, Canada.

WINHEC (World Indigenous Nations Higher Education Consortium). (2014). World Indigenous Nations Higher Education Consortium. Retrieved from <http://winhec.org/wp-content/uploads/2016/06/WINHEC-Brochure-2014.pdf>

WINHEC (World Indigenous Nations Higher Education Consortium). (2016). World Indigenous Nations Higher Education Consortium. Retrieved from <http://winhec.org/about-winhec/>

Yap, M., & Yu, E. (2016). Data sovereignty for the Yawuru in Western Australia. In T. Kukutai & J. Taylor (Eds.), *Indigenous data sovereignty: Toward an agenda* (pp. 233-251). Canberra, Australia: ANU Press. doi:10.22459/CAEPR38.11.2016.

Yu, P. (2012). The power of data in Aboriginal hands. Retrieved from http://caepn.anu.edu.au/sites/default/files/Publications/topical/TI2012_04_Yu_PowerOfData.pdf