

Developing a Business Case for New Programs: A National Case Study for Associate Degrees

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Structured Abstract

BACKGROUND

The Minerals Industry National Associate Degree (MINAD) project commenced in 2012 as a partial solution to address a long-term, endemic shortage of professionals in the Mining Engineering and Geoscience disciplines in Australia. The MINAD project engaged educational providers, mining companies and relevant industry organizations to design, develop and pilot the two programs at two Australian education providers in 2014.

PURPOSE

The intent of the MINAD project was to address the shortage of mining engineers and minerals geoscientists. An aspect of this was to extol to the minerals industry the benefits of enhancing the para-professional workforce in order to establish an alternate pathway in the development of future professionals. In part this took the form of a MINAD Business Case as a mechanism to identify industry needs and expectations, to assess viability of proposed MINAD programs and to develop this new alternate para-professional into the workforce.

DESIGN/METHOD

In 2013 an Industry sub-committee was formed to develop a business case for a paraprofessional role within the minerals industry. The sub-committee undertook an environmental analysis, a benefits analysis survey, and a workforce redesign review. Utilising the Workforce Development Employment model by Blacker *et al* (2011) this paper looks at how the approach undertaken by the sub-committee underscored stage 4 of the model concerning the need for ongoing partnership and workforce planning.

RESULTS

The MINAD Business Case demonstrates an approach that provides value add to the WDE Model, primarily around (stage 4) determining the need for ongoing partnership and workforce planning. The environmental analysis looked to validate “the best potential solution to workforce needs” (stage 1), and these findings were further validated by the benefits analysis survey, which also provided clear labour market signals to education providers. Finally, the process of working through redesign issues with the assistance of the MINAD education sub-committee has greatly contributed towards the advance of transitional outcomes to future MINAD students. This collaborative approach is indeed an essential ingredient for ‘employment logic’ in education programs.

CONCLUSIONS

The MINAD project is distinct from other new education programs in that it has “strong linkages with employers in the design, delivery, and assessment,” of the program. The WDE model by Blacker *et al* (2011) provides a useful framework for engagement between industry, higher education and the VET sectors. This paper focused on Stage Four of the WDE model and introduced the approach that the Industry sub-committee took to develop a business case for paraprofessionals within the minerals industry. This approach has ultimately validated stage one findings, strengthened ties between social partners, and developed clear labour market signals to education providers. Such an approach at stage 4 of the WDE model may be useful to other education providers or industries.

KEYWORDS

Associate Degree, Mining, Geoscience, Industry Collaboration.

Introduction

The Minerals Industry National Associate Degree (MINAD) project has set out to create two new associate degree programs in mining engineering and geoscience (i.e. Australian Qualifications Framework Level 6) to address long-term skills shortages in these disciplines within Australia's minerals industry. (MCA, 2012, Lind, 2014, AWP, 2014) The end-state is an industry guided education program consisting of two new industry-supported, nationally consistent, and nationally accessible Associate Degree education programs.

An alternative training pathway leveraging off AQF 6 para-professional qualifications was posited by the Minerals Tertiary Education Council (MTEC) as a way to ameliorate long-term skills shortages in Mining Engineering and Geoscience (as a response to recommendation 3 of the National Resources Sector Employment Taskforce report (NRSET, 2010). The MINAD project is unique insofar as it brings together the three social partners of industry, education, and Government. (Moodie *et al*, 2013) The MINAD Project is supported by the Department of Innovation with a three year project lifespan to November 2014.

The critical role employers' play in developing and supporting AQF 6 programs is well documented (Blacker *et al*, 2011; Dowling, 2011; Moodie *et al*, 2013). This paper reports on the business case approach to better understand the fit of an Associate Degree for the minerals industry as well as the associated workforce planning required. This paper also provides educators and other industries with an approach for introducing Associate Degrees that would be of interest to other (non-mining) industrial sectors in addressing professional shortages.

Employment Logic in Associate Degrees

Traditionally liberal market economies such as Australia use the market to coordinate the economy and match graduates to jobs. However, as Wheelahan *et al* (2012) posits, while Australia is a liberal market with a unified secondary school system, its tertiary education system is differentiated "between VET and higher education, which is characteristic of Northern Europe." There is also diversity between regions and within industries that are affected by business, institutional and policy settings; modes of engaging labour; structure of jobs; and the overall formal and informal skills formation (Buchanan *et al* 2001). Iannelli and Raffe (2007) have explored the difference between systems where vocational education follows an 'employment logic' and those where it follows an 'education logic'

Iannelli and Raffe (2007) define employment logic as having strong linkages with employers in the design, delivery, and assessment of vocational programs, and where labour market signals to education providers is very strong. Moodie *et al* (2013) and Wheelahan *et al* (2012) argue, however, that in general Australian mid-level qualifications are geared more towards educational rather than employment logic (or outcomes).

The role employers' play in developing and supporting AQF 6 programs vis-a-vis workforce skills needs is well documented (Sung 2010, Blacker *et al*, 2011, Dowling, 2011, and Moodie *et al*, 2013). Of note, it is generally considered that industry involvement in the development and delivery of curriculum is ad hoc and fragmentary (King, 2008; Paez *et al*, 2010). In engineering paraprofessional programs, for instance, Dowling (2010a, 2010b and 2011) identified the complexity of offerings as often being confusing to both student and employer. This complexity is exacerbated by the fact that para-professional engineering education straddles the divide between the higher education and vocational education and training (VET) sectors within Australia (Dowling 2010a).

Blacker *et al* (2011) presents an approach around articulation pathways and their linkages between industry, VET, and higher education sectors ("employment logic"). This is formulated as the Workforce Driven Engagement Model (WDEM) in Figure 2, with the arrangement designed to encourage more structured articulation pathways and linkages

between the three stakeholders in order to develop education and training solutions in line with Australia’s economic needs.

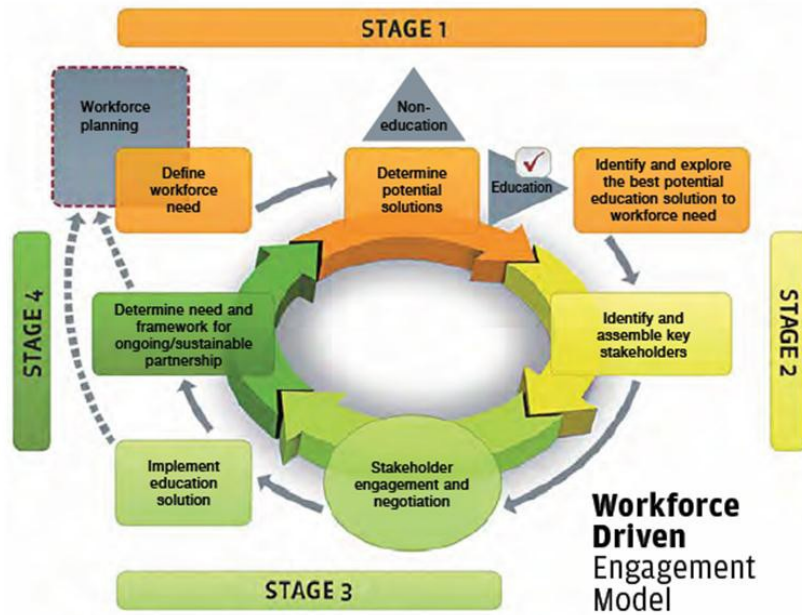


Figure 2: Workforce Driven Engagement Model (Blacker et al, 2011)

The MINAD project can be mapped against the Workforce Driven Engagement (WDE) Model (Table 1). Stages 1 through 3 are not addressed in this paper. (See Ayers et. al., 2014) This paper focuses on the genesis of the MINAD Business Case (Stage 4 of the model).

Stage	Description	MINAD Project
1	Workforce planning helps define the workforce need and determine potential solutions. Potential education solutions can then be explored.	MCA determines need for alternative training pathway in mining engineering and geoscience. MTEC project raised.
2	Stage 2 involves identifying and assembling the key stakeholders.	An Industry Implementation Committee formed. A working group of HE and VET providers established.
3	Stage 3 involves stakeholder engagement and negotiation and the implementing the education solution	Design Your Discipline (DYD) Stakeholder Consultation undertaken to create MINAD Education Model
4	Stage 4 is about determining the need and framework for maintaining an ongoing and sustainable partnership.	MINAD Business case determines need for ongoing sustainable partnership.

Table 1: MINAD project activities against the Workforce Driven Engagement Model

The MINAD Industry Sub-Committee

When the MINAD (Education) Model was presented (Stage 3) to a combined industry and education Roundtable in April 2013 (Ayers et. al., 2014), an industry (and education) sub-committee was proposed to move the Model to pilot phase and to determine the need for ongoing sustainable partnership (Stage 4). The industry sub-committee was mandated to develop a business case for a paraprofessional role within the minerals industry.

In May 2013 MTEC invited Minerals Council of Australia (MCA) members to participate in the MINAD Industry Sub-Committee via the MCA Workforce Committee and MINAD Industry Advisory Panel. Senior technical and human resource professionals from Anglo-Coal, AMC Consulting, BMA Coal, Downer EDI Mining, and Thiess made up the membership, with

MTEC providing Secretariat support to both Industry and Education sub-committees.

The Business Case for a Minerals Industry National Associate Degree program

From June to October 2013 the Industry Sub-committee worked through and identified workforce re-design issues and developed a business case for the MINAD Associate Degree Program.

Environmental Analysis

The purpose here was to test the stated objectives of the MINAD Project against environmental conditions within the Minerals Industry as at 2013. The Industry sub-committee conducted a desktop analysis of environmental conditions. Sub-committee members provided context to these findings through their own company experience, and interviews were conducted with non-sub-committee members.

The sub-committee found that the high demand for mining engineers and geoscientists at 2013 had reduced (by 9.5% from May 2012 to May 2013) since project inception. (NRSET, 2011; ABS, 2013; DEEWR, 2013) According to an MCA report (2012), the minerals industry had undergone a structural adjustment from its high cost base as one way to respond to the increasing productivity impediments, which both ABS data (2013) and sub-committee members confirmed.

Nonetheless, a review of the supply capability of VET, higher education, and skilled migration revealed longer-term shortfalls that threatened longer-term productivity. The sub-committee found (and agreed) that industry preferred 'in-house' training to VET providers (NRSET, 2013); higher education providers could not and would not expand offerings in the two disciplines due to the cyclical nature of the industry (MCA, 2012); and that skilled migration was not the panacea to fill cyclical skill voids. (MCA, 2012). Member companies also indicated future unskilled and semi-skilled workers would require higher levels of knowledge and training to undertake more technical duties as Australia's minerals industry moves towards automation as a means to reduce risk, increase productivity and diversify the workforce mix. (McNab et al, 2012)

In analysing the gap between the "current environment" and the aforementioned objective, the sub-committee found that while the demand for an alternative supply mechanism had reduced, there was a longer-term requirement to develop an alternative training pathway to ensure sustainable future supply.

Benefits Analysis

To test the validity of this finding, the sub-committee developed a 'benefits analysis survey' designed to identify what positive value is expected to be obtained from a MINAD paraprofessional program to industry. It will also help in the assessment of whether the industry collectively proceeds with a paraprofessional role in the short to medium term, and provides a basis for future assessment on whether the benefits were realised.

A 14-question survey was designed and distributed to MCA member companies, specifically industry decision-makers, mine managers, and technical supervisory staff. Thirty survey responses were returned. While a comprehensive analysis of all survey results is beyond the scope of this report, the following sample lends support to the environmental analysis finding.

- 93% of respondents agreed or strongly agreed that the establishment of a paraprofessional position in mining companies will create new career pathways for trades people, experienced miners, supervisors, and plant operators.

- 73% of respondents felt the establishment of a paraprofessional position in mining companies would enhance retention in companies (23% neutral).
- 77% felt that MINAD paraprofessionals would help overcome skilled labour shortages in the two areas of discipline (20% neutral).
- 80% of respondents felt their organisation sees the benefits in introducing a paraprofessional role into the minerals industry (20% neutral).
- 87% of respondents felt that the MINAD paraprofessional will acquire skills and knowledge that are in demand within the minerals industry.

The Industry sub-committee then analysed these findings against the stated project objectives and the gaps found via the environmental analysis. Key survey indicators demonstrated that a MINAD education program will offer particular value-add to existing unskilled and semi-skilled workforce, to individual mining companies, and the minerals industry overall.

Workforce Redesign

In parallel to the environmental and benefits analysis, the industry sub-committee worked through a range of workforce redesign issues to enable companies to either offer a paraprofessional program or encompass paraprofessionals into their workforce profile. A member of the MINAD Education Sub-committee outside of the Secretariat was invited to provide guidance on the educational aspects of these issues. The following outcomes were achieved:

- A profile on target-market: existing workforce, local communities, mature-aged students, school-leavers, and international students.
- Via the MINAD Education Model, the development of the MINAD 'Indicative Capability Tasks' manifest to be used by organisations in framing the tasks and job descriptions for the paraprofessional.
- A generic set of duties for each paraprofessional discipline was developed via the MINAD Education Model.
- A case study of an MCA member company that had previously raised a paraprofessional program in the past. This centred on organizational support, paraprofessional outputs, lessons learnt and relationship management with education providers.
- Key organisational stakeholders.
- Anticipated cost in raising a MINAD Paraprofessional program to the company.

Key to the successful completion of this outcome was working with the education sub-committee through its representatives who guided the industry sub-committee through the educational requirements and expectations of associate degree students. The sub-committee found that while championing an associate program vertically is key e.g. executive level champions, it is also an imperative that horizontally accepted is achieved, especially at the operation level. Through the case study and feedback from the education representative, developing a good working relationship with the education provider is also key to longer-term sustainability of the program.

Employment Logic as Key

As noted by Wheelahan et al (2012, p. 20), we see both educational and employment logic operating in Australia, but with a tendency towards education logic, which is indicative of a weak link between education and work. Nonetheless, there are industries such as the minerals industry where links between education and work are much stronger. (Wheelahan

et al, 2012) The minerals industry through the Minerals Tertiary Education Council (MTEC) has invested almost \$40m since 2000 in minerals education across 14 University partners in three collaborative programs in mining engineering, minerals geoscience, and metallurgy. (Lind, 2014). This 'employment logic' approach has been adopted in advancing the MINAD project.

The role a MINAD qualification will play in assisting graduates to gain employment within the minerals industry is linked to the development of qualifications with "employment logic". Through extensive consultation with industry and tertiary education practitioners, the MINAD Education Model was developed and formulated using the graduate capability framework via the Design Your Discipline (DYD) approach (Dowling and Hadgraft, 2013). A parallel process to the educational development was the advance of a business case for the minerals industry centred on the MINAD para-professional.

The MINAD Business Case demonstrates an approach that provides value add to the WDE Model, primarily around (stage 4) determining the need for ongoing partnership and workforce planning. The environmental analysis looked to validate "the best potential solution to workforce needs" (stage 1), and these findings were further validated by the benefits analysis survey, and provided clear labour market signals to education providers. Finally, the process of working through redesign issues with the assistance of the MINAD education sub-committee has greatly contributed towards the advance of transitional outcomes to future MINAD students. This collaborative approach is indeed an essential ingredient for 'employment logic' in programs.

Moodie *et al* (2013) highlight the collaboration between the "social partners" (being industry, government and tertiary education providers) as being distinctive in their assertion that the MINAD project has the most potential for entry to and progression in a vocation.

Conclusion

The MINAD project has looked to raise two associate degree programs in mining engineering and minerals geoscience, and introduce new para-professional roles within the minerals industry. The MINAD project is distinct from other new education programs in that it has "strong linkages with employers in the design, delivery, and assessment," of the program. The WDE model by Blacker *et al* (2011) provides a useful framework for engagement between industry, higher education and the VET sectors. This paper focussed on Stage Four of the WDE model and introduced the approach that the Industry sub-committee took to develop a business case for paraprofessionals within the minerals industry. This approach has ultimately validated stage one findings, strengthened ties between social partners, and provided clear labour market signals to education providers. It is divergent from the WDE model in that it is an industry guided initiative with 'employment logic' at the fore.

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