

Finding the sweet spot – The key to enduring industry relationships

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STRUCTURED ABSTRACT

CONTEXT

Global challenges such as climate change, increasing populations and diminishing natural resources in conjunction with changing business environments require a new kind of engineering graduate. In response to this the Swinburne Engineering Practice Academy (the Academy) and its associated Bachelor of Engineering Practice (Honours) has been developed employing practice-based learning approaches. Within the Academy students engage with industry projects and pro-bono, service-learning projects for community-based organisations. Industry projects are student-led under the guidance of academic facilitators and Academy project principals, who manage relationships with clients. Credentials provide just-in-time learning of the required knowledge and skills to deliver the project. To be sustainable practice-based learning approaches require close collaborations with industry and must be responsive to industries changing needs at the same time ensuring that student learning needs are met. Considered approaches to industry engagement and presenting partners with a variety of ways to stay engaged throughout the year is required to strengthen relationships and manage expectations.

PURPOSE

This paper will present frameworks used within the Swinburne Engineering Practice Academy for the creation of mutual value with both industry and community-based partner organisations to support practice-based learning.

APPROACH

Frameworks were developed within the Swinburne Engineering Practice Academy to establish (business development) and maintain (stewardship) relationships with industry and community partners in addition to co-creating student projects (projects framework).

RESULTS

An overview of the business development, stewardship and projects framework are shared. The results of this paper reflect on the implementation of these frameworks to find the sweet spot in balancing the needs of the industry and community clients with student learning needs in addition to the skills required of university staff to broker these partnerships.

CONCLUSIONS

Balancing the learning needs of students with the needs of an industry or community-based client is integral to the success of practice-based learning approaches. Crucial to the success of student projects with a client is to engage with the partner organisation through multiple touchpoints that allow for the successful management of expectations and the creation of long-term sustainable relationships.

KEYWORDS

Industry relationships, Community relationships, Real-world projects, Practice-based learning

Introduction

Society is facing global challenges such as climate change, increasing populations and diminishing natural resources in conjunction with changing business environments and innovations in technology. The complexities of these challenges require a new ways of working. The *Engineers for the Future* (King, 2008) and the *UNESCO Engineering Education* (Beanland & Hadgraft, 2014) reports highlight that there is a skill gap among engineering graduates resulting in engineers underprepared to grapple with the complexities of these global challenges. In order to close this skill gap engineering education must evolve.

The establishment of the Engineering Practice Academy (the Academy) at Swinburne University of Technology created an opportunity to re-think engineering education. In order to prepare graduates to tackle the complexities of global challenges the Academy's approaches systematically introduce complexity to Associates through practice-based educational approaches centred on authentic contexts and practices.

Practice-based pedagogies prepare students to work in their chosen profession by simulating the work environment (EFPI, 2015). In the Academy this has been taken one step further. The Academy has been established as a functioning engineering practice on campus where students join as Associates enrolled in the associated Bachelor of Engineering Practice (Honours) (BEngPrac[Hons]). The BEngPrac(Hons) has been co-created with industry (Cook, et. al., 2017) and is delivered through real-world projects with industry and community-based clients.

When considering the Academy as a functioning engineering practice, it is clear that a primary business aim is to provide meaningful outcomes for clients. Unlike most engineering practices, however, the Academy also provides a service to its Associates by providing a high quality learning product—the BEngPrac(Hons). The interdependency between the delivery of projects with industry and community clients and the provision of authentic learning environments results in the need to constantly balance student learning needs with the needs of clients to ensure sustainability of the approach.

To ensure that the Academy delivers high quality outcomes for industry and community clients in addition to meeting student learning needs business development, stewardship and industry frameworks have been developed. This paper describes the nature of these frameworks and reflects on their early implementation through a case study. Both the framework description and implementation reflections will provide useful insight to others seeking to adopt practice-based approaches.

The Academy: a functioning engineering practice and an authentic learning environment

Establishing the Academy as a functioning engineering practice on campus where Associates and staff work together to deliver projects for industry and community clients allows the Academy to:

- Translate the advanced knowledge held within universities into insights and **value for clients**;
- Create leaders within industry to **evolve engineering practice**;
- Foster **innovators and entrepreneurs/intrapreneurs** that practice engineering in new ways;
- Use projects co-created with Industry to **drive curriculum**, ensuring its relevance;
- Prepare our Associates to tackle **complex global challenges**;
- Provide opportunities for Associates to understand the **complexities of real practice**; and
- Provide opportunities for Associates to **apply theory** into practice.

To achieve this the Academy must first have a focus on 1) business development—to attract clients to provide projects that provide Associates with exposure to a diverse range of engineering practices; 2) project delivery—to ensure both high quality outcomes for clients and rich learning experiences for Associates; and 3) stewardship of relationships between industry and community clients and the Academy to ensure sustainability.

Business Development Framework

Business development (BD) is “the creation of long-term value for an organization from customers, markets, and relationships” (Pollack, 2012). In the context of the Engineering Practice Academy, it is the creation and fostering of partnerships with organizations in industry and across the community that

will provide value to the Academy, and by extension, our Associates across many years. Value is very broadly defined and we define it across three categories: supporter, client, and patron. But our approach is to be non-prescriptive in how industry and community organisations and the Academy interact, so within each category there is a large degree of flexibility.

The practice-based nature of the BEngPrac(Hons), requires a steady flow of projects from industry and community clients. A dedicated business development function ensures that new and relevant projects are continually being sourced.

In addition, we actively seek opportunities for other ways that industry and community organisations can support our Associates through supporting the Academy and its programs. Supporters of the Academy associate their brand with that of the Academy and the broader university, for mutual benefit. Supporters are also our first choice for sourcing individuals to lend time and expertise to Academy programs, such as our admissions process and industry mentoring program. Patrons provide financial contributions to the Academy for the benefit of our Associates.

The BD framework serves three functions:

1. Provides a structure and guidance for people with no or limited BD experience to work effectively in a business function that requires specific skills;
2. Ensures a consistency of approach across the multiple people involved in BD activities, resulting in a consistent and high-value experience for prospective industry and community partners; and
3. Allows for BD activities to be monitored and evaluated.

BD framework structure

The BD framework is divided into processes around leads and opportunities. Leads are potential industry and community partner organisations for which the level and type of interest has not yet been established. Leads can be generated through incoming contact to the Academy or via desktop research. Once identified, leads are prioritised by assessing their alignment to Academy values, industry sectors and curriculum, pre-existing relationships with other areas of the University are identified, and an ethical partnership check conducted. From here, contact is established by the most appropriate member of staff with the intention of establishing a dialogue through which the level and type of interest can be established, at which point the lead is either disqualified (no interest) or converted to an opportunity (interest known).

Opportunities are those organisations where interest exists in establishing a mutually beneficial relationship, and the process differs depending on the relationship type that is being developed (Supporter, Client, Patron). Once a Client opportunity is created, Academy staff develop a tailored value proposition for the client, based on an understanding of the business needs expressed in earlier conversations. A tailored engagement plan is also developed, based on the Academy's broader engagement and stewardship framework (see below). Finally, subject-matter experts within the Academy are brought into the conversation to begin scoping projects. It is at this point that the Business Development and Project Frameworks intersect.

Fundamentally, there is very little that the Academy does differently when it comes to Business Development. What sets the Academy apart is not so much the approach to Business Development, but, in comparison to other Academic teaching programs, that it has a dedicated BD function integrated within the program itself. Rather than relying on centrally-resourced, shared-services teams within the broader faculty or university, or leaving the approach to BD as an ad-hoc activity that academic staff undertake alongside their teaching responsibilities, the Academy resources a dedicated BD function where the work happens. It is this approach to BD that will make the Academy successful. The challenge that the Academy will face will be ensuring that the BD work that it does and the relationships it creates remain connected to the broader university.

Project Framework

The Academy works with two kinds of clients, industry and community. Industry projects focus on working with organisations to realise emerging engineering opportunities. Associates work on four intensive six-week industry projects a year with each project focusing on one of four curriculum pillars: social impact, emerging technology, research and development, and entrepreneurship. Rather than graduating with a traditional engineering major, e.g. mechanical or civil engineering, Associates specialise in emerging industry sectors: industry 4.0; internet of things and people; products designed

for people; and smart cities. In addition to working on four industry projects a year, 15% of an Associate's workload is dedicated to delivering projects that contribute to addressing social challenges in collaboration with community-based clients. Curriculum is delivered with a just-in-time approach where students learn theory through small modules known as credentials and apply this theory directly into their project work.

Early in the BD process, efforts are made to categorise leads across a number of dimensions relevant to the academic nature of the program: namely the primary and secondary industry sectors, curriculum pillar alignment, and technical complexity of any potential projects. This provides business developers and later Academic staff with a thorough understanding of where projects will likely fit within the structure of the Academy's Academic year and the likely year-level cohort that would undertake the work. Knowing this breakdown early in the process allows the industry or community client's expectations to be managed.

Industry projects allow Associates to gain first-hand experience of the realities of professional engineering practice and provide opportunities to apply theory in a number of real-world contexts. Community projects allow Associates to develop a personal understanding of their responsibilities as engineers to create positive impact in the communities in which they work and gain experience of navigating the complexities of societal issues.

The purpose of the project framework is to ensure consistent approaches and quality outcomes balancing the needs of both clients and Associates.

Project framework structure

The projects framework is divided into six sections: 1) scoping; 2) initiation; 3) planning; 4) execution; 5) monitoring and evaluation; and 6) close-out.

During the project scoping stage project opportunities identified through the Academy's BD processes are further scoped. Project Brief templates are provided to collect enough information about the project including: required outcomes; client success metrics; stakeholders; and project constraints, in order to make a judgement call on how well the project will meet student learning needs. The Project Brief is used to decide if the project is suitable and should be progressed. Projects that are deemed unsuitable for the Academy are, in most instances, referred internally to other areas of the university. If a project is deemed suitable to progress, the assigned Project Principal—a role filled by a member of academic staff—initiates the project by providing a proposal based on the Project Brief and a legal contract to the client clearly defining project deliverables, timelines, roles, and responsibilities.

Once the legal contract is signed, Project Principals enter the project planning stage completing a Project Initiation Document that details all aspects of the project including; project details and requirements; approach; roles and responsibilities of Academy Associates and staff as well as the client; project benefits, opportunities and risks; occupational health and safety requirements; human ethics requirements; budget and resource requirements; alignment to curriculum; project timelines; and finally a monitoring and evaluation plan.

The Project Initiation Document is used by both Project Principals and Associates to successfully deliver the project outputs in collaboration with the client and evaluate the project outcomes and the impact they produce for clients and Associates, in addition to the effectiveness of the project implementation processes.

Upon completion of a project, the Project Principal, often accompanied by either a business developer or the steward (see below), meet with the client to conduct a close-out workshop where project outcomes are reviewed, successes celebrated, and the next steps discussed. The completion of a project may result in a natural end to the relationship between the Academy and client however, the desired outcome is an ongoing relationship that could lead to further opportunities in the future.

A challenge the Academy will face will be to provide enough authentic project opportunities for Associates as the Academy scales. Sourcing new client leads and to generate opportunities for every project requires intensive BD resources. The Project Framework is designed to assist Project Principals to develop a deep understanding of client needs and to deliver a project that effectively meets these needs. Projects that exceed client expectations and satisfy their needs are more likely to result in further opportunities. The Stewardship Framework also assists in this regard by engaging the client in other ways throughout the duration of the project so that the delivery of projects is not the only value the Academy brings to a client organisation, making it more likely that they will continue the relationship and consequently utilizes BD resources more efficiently.

The Project Framework has been adapted from project management methodologies commonly used in business such as Prince2 and SixSigma. While these methodologies are common in business it is rare to find them consistently deployed in student projects and rare to see them utilised in a higher education context in a way that sees academic staff and students working together on a project team, albeit in different roles. Mimicking common business practices strengthens the Academy's practice-based educational approaches and contributes to the overall success of the Academy.

Stewardship Framework

Stewardship in the context of the Academy is the approach we take to managing the relationships established by our BD function over the long-term, to ensure that they continue to be valuable for both the Academy and our industry and community partners.

As previously stated, the Academy requires the active and ongoing involvement of industry in order to deliver its practice-based education model, and as such, needs to ensure that our relationships with industry are actively maintained and stewarded. In addition, the organisations that we partner with while our Associates are undertaking their studies are the same organisations that they will be seeking employment with once they graduate, so the Academy has a moral obligation to its Associates to ensure that the reputation of the Academy within industry is safeguarded.

The stewardship framework ensures that we are constantly talking to our partners and providing them with the value that was originally promised in a manner that is of optimal use to each partner. It also provides a mechanism for monitoring the health of the relationship and determining when the relationship is no longer of value to the Academy or the partner, and gracefully ending the relationship.

Stewardship framework structure

Unlike the BD and Project Frameworks, the Stewardship Framework is less a process, and more a set of principles that guide how Academy relationships should be managed over the long term. It ensures that we provide flexible and tailored mechanisms for partners to engage with the Academy, and regular opportunities for the Academy and the Partner to communicate what each side wants to achieve from the relationship and how they want to go about achieving it. It also ensures that we regularly acknowledge the relationships that we establish, both with the partners themselves, and through our broader communications.

Constant dialogue between the Academy and the Partner ensures that the relationship delivers value to both parties. When the relationship is no longer mutually beneficial it can be ended in a positive manner. This means that the Academy is not resourcing relationships with industry and community partners that are not providing value to our Associates.

Like our BD framework, there is nothing revolutionary in our approach to managing relationships. Stewardship frameworks similar to the Academy's exist in Universities across Australia, particularly in the Advancement functions. However, our focus on establishing lasting relationships that generate mutual value, rather than being purely transactional in nature, is a more nuanced approach than that taken by most Academic departments.

Our approach relies on a tailored, or personalised approach to relationship management. As the Academy scales, this approach will consume more resources, so we must constantly ensure that we are mindful of the business case that justifies continuing with this approach.

Reflection on frameworks in action – A case study

The first cohort of Associates joined the Academy in March 2018 and from day one the frameworks described above have been in place to deliver projects with our clients. One such client is Hobsons Bay City Council (HBCC). HBCC in collaboration with SeaWorks are develop a Creative Technology Hub (CTH). The intent of the CTH is to create a learning community to 'engage the disengaged' in the local area, with a focus on new technologies, such as 3D printing, robotics and green-screen technologies. The project between the Engineering Practice Academy and HBCC generated different design concepts for the integration of learning content into the CTH, with a focus on 3D printing and robotics. The following case study is a reflection by academic Enda Crossin on his engagement with the project to develop learning resource concepts for the CTH.

What was your role in the project?

Enda: I had three formal roles in the project. My primary role was Project Principal. As Project Principal, I was the main person responsible for maintaining the relationship with HBCCC during the project, scoping the project, and finally to oversee the delivery of the project. My second role was as a studio facilitator, whereby I supported Associates in their learning to deliver the project. My final role was as unit conveyor, which included aligning the curriculum of the Bachelor of Engineering Practice (Honours) course with the project, marking, and grade moderation.

What were HBCC's objectives / needs?

Enda: HBCC's primary objective for the CTH is to ensure that that people in their council area are engaged with the CTH and with each other. Given that this is a long-term goal, the contribution the Academy would make to achieving this was negotiated during the project scoping phase. The Academy's project would be considered successful if the learning resources concepts were presented that clearly articulate how they could be used to engage and inspire young people in the area.

What were the Academy's objectives / needs?

Enda: The Academy's needs included developing a strong relationship with HBCC, and to develop Associate's capabilities with respect to human centered design, project management and communication.

How did you balance the needs of the client with student learning needs?

Enda: Early conversations with HBCC and the Engineering Practice Academy focused on the expectation that the project was primarily a learning activity. The balance was managed by negotiating a project scope that ensured that the needs of the client and Associates could be met. During the project, I balanced the needs on three fronts. Firstly, I mapped out expectations of student progress early on, and used formative techniques to check that students were making sufficient progress through the project, but also staying within the project scope. Secondly, I maintained an ongoing dialogue with HBCC so that they were aware of this progress and scope containment. Finally, I was prepared to manage scope creep (where a client asks for a little bit more work, beyond what was originally agreed to), but this was not needed.

What was similar and / or different in how you approached this project to your other experiences teaching project / practice based courses?

Enda: The project was most similar to my experiences with the Engineers Without Borders (EWB) Humanitarian Design Summit. The similarities included student's close, but managed, interactions with stakeholders, a strong focus on understanding the design context, and the need to communicate why the design concepts were good (and not just the what and how). Finally, the sense and feeling of collective student achievement with the HBCC was similar to that of the EWB Humanitarian Design Summit.

With respect to what was different, I found that in this project, there was (is) also a very strong focus on continuous improvement, beyond typical teaching evaluation metrics. This change in focus meant that I spent time considering, and consulting with stakeholders, on what success would look like from different perspectives

What were the outcome(s) of the project?

Enda: Associates delivered several learning resource design concepts for the CTH. HBCC have indicated the potential to integrate a number of these design concepts into the CTH, and are now considering how these could be further developed. One concept, whereby members of the community design, build and race yachts, was chosen by HBCC as having the strongest potential to build a community around the CTH. This design concept has now been negotiated into a longer-term community project with the Academy, and Associates will continue to work with HBCC in the immediate future.

In your opinion what made the project successful?

Enda: I think that the project's success was underpinned by a deep understanding of what mutual success would look like. Coupled with this, was a detailed plan documented in the Project Initiation Document, which was closely monitored during the project. Within this plan was a strong focus on the student's understanding of stakeholder needs. These needs were further

reinforced by ongoing interactions between stakeholders and the project team (students and staff), which meant that students stayed on-task and were focused on a quality outcome.

What was the most significant change in how you personally approach practice-based learning after completing this project?

Enda: In most work integrated learning (WIL) projects that I've been involved with, there was a mismatch between who was responsible for the quality of the outcome (typically the student) and ownership reputational risk (typically on the industry partner and/or university). The responsibility of quality would usually be discussed with an industry partner, and would be prefaced with "it's a student project, quality can vary". With this came an implicit expectation that the industry partner would take on and accept risks associated with the project's outcome. In contrast, as a Project Principal, I felt that the ownership of this risk was tilted back towards me, as an individual. I felt a very strong responsibility and ownership, compared with other WIL projects. I felt that if the project was not successful, that my reputation would be damaged (and not just that of the university and students). This sense of ownership changed the way I approached the project.

Conclusion

The Engineering Practice Academy is creating a practice-based education environment in which Associates gain first-hand experience of the realities of engineering work and develop knowledge and skills through practice working on real-projects, with real clients, preparing them to tackle complex global challenges. Balancing the learning needs of students with the needs of an industry or community-based clients is integral to the success of practice-based educational approaches. Crucial to the success of student projects with a client is to engage with the partner organisation through multiple touchpoints that allow for the successful management of expectations and the creation of long-term sustainable relationships. Business Development, Project, and Stewardship Frameworks have been developed to increase the Academy's success at achieving this goal.

At the time of writing this paper the Academy was less than one year old and so while the effectiveness of these frameworks in achieving the Academy's goals cannot yet be evaluated they are described here and a case-study reflection on their implementation is provided to stimulate discussion among those seeking to employ practice-based pedagogies in higher education.

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Acknowledgements

The authors would like to acknowledge staff of the Swinburne Engineering Practice Academy that have contributed to the development and implementation of the business development, projects and stewardship frameworks. In particular, the authors would like to acknowledge Tim O'Hanlon who leads the Academy's stewardship strategy.