Theory in the Service of Practice: WIL and the curriculum

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Introduction

In Australia, the decline in the availability of traditional work placements due to "privatisation of formerly state-owned engineering infrastructure, movement offshore of engineering-based manufacturing, and the rise of contract-based engineering services firms" (Male & King, 2019, p. 103) has led to developments in non-placement work integrated learning (WIL) to supplement work placements. Efforts are underway to develop and provide work integrated learning experience to engineering students through virtual modules that do not involve real work for an employer (Male, 2017; Male, Hargreaves, & Pointing, 2017). Modules are being tested for their efficiency (Male et al., 2018). This is aligned with other local and international efforts in recent years to offer students the experience of professional practice within the curriculum (Kaider & Hains-Wesson, 2015; McRae, Pretti, & Church, 2018).

To appropriately incorporate WIL into the curriculum, the actual learning objectives and outcomes need to be clearly defined. Learning outcomes of WIL have been defined in the WIL literature with a view mainly connected to employability, or employability skills or competencies (Jackson, 2013; Smith, Ferns, & Russell, 2014). Definitions of employability skills or competencies are generally defined in terms for graduates at the end of their program. Learning outcomes intended for particular units are not specified in employability skills. Educators must translate the proposed employability skills to be achieved through WIL (Jackson, 2013; Smith, Ferns, Russell, & Cretchley, 2014) into intended unit learning outcomes, in the same manner that graduate attributes are translated into intended unit learning outcomes (Biggs, 2011).

Various terms have been used for WIL outcomes, including, but not limited to: student outcomes, employability skills, employability outcomes and employment readiness (Jackson, 2013; McRae et al., 2018). Typically the literature defines the target learning outcomes for WIL very generically such as 'application of theory in practice' or 'professional communication' (McRae et al., 2018; Smith et al., 2014). In this study, we are concerned to develop more precise outcomes for WIL in engineering that will help us prepare students for practice and know whether they have attained the target learning.

We propose that the existing literature on how to engage students with professional practice is limited by its focus on under-defined content such as 'communication', when the problem also has elements of learning to deal with cultural differences involved in moving from the world of university with one set of goals and assumptions to the world of work. The theories of Pierre Bourdieu (Grenfell, 2008) allow us to operationalize "culture" for a deeper and more comprehensive analysis.

Bourdieu's (1984) theoretical framework describes dimensions of recognition, familiarity and access similar to a 'feel for the game'. In engineering, feel for the game includes knowledge such as when calculations can safely be simplified. Every professional setting has its own feel for the game. We suggest that the hurdle of defining learning outcomes for WIL can be enhanced by thinking of the changes we want to see in students as produced by a journey from one field, that of studying at university, to the different one of engineering practice. We turn to the theories of Pierre Bourdieu in order to provide some analytic apparatus.

By analysing transcripts from focus groups on WIL with engineering students at three universities in Australia, we identified differences between how engineering students describe the cultures of university and of work.

Theoretical Framework: Bourdieu in a Nutshell

Bourdieu described social life as taking place in a number of distinct **fields** which he explains with analogies such as a sporting field. By this he means to indicate a fairly defined social space in which the action and practices of those present are constrained by field-specific rules. We each move through a number of fields in the course of a lifetime and in the course of a day. We wake up into our position in the domestic field with its own rules and values but when we arrive at work our position is quite different and we expect to act in different ways in pursuit of different goals. Bourdieu describes each field as being generated by a struggle over **capital** (or the pursuit of goals) which is particular to that field and constituted of relationships which proceed according to locally sanctioned rules for behaviour. Within a particular domestic field getting the chores done in a fair division of labour may be the goal, and actors will call on their notions of what is appropriate to age, gender and generation to decide how the goal is accomplished. Each social actor within the field brings with them their own set of perceptions, values and behaviours (***habitus***) with which they negotiate and change the field. Bourdieu on occasion used sporting analogies to help explain the concepts of field, capital and habitus and we will attempt to do the same here.

> *We can indeed, with caution, compare a field to a game (jeu) although, unlike the latter, a field is not the product of a deliberate act of creation, and it follows rules, or better, regularities, that are not explicit and codified. Thus we have stakes (enjeux) which are for the most part the product of the competition between players. We have an investment in the game, … players are taken in by the game, they oppose one another, sometimes with ferocity, only to the extent that they concur in their belief (doxa) in the game and its stakes; they grant these a recognition that escapes questioning. Players agree, by the mere fact of playing, and not by way of a 'contract', that the game is worth playing, that it is 'worth the candle', and this collusion is the very basis of their competition.* (Bourdieu & Wacquant, 1992, pp. 98-101)

If we take the game of football as our example it is easy to see that the distinct field in this case is the space in which the rules of football and the contest over goals take place. Goals are what the game is about and constitute the ultimate capital, but a variety of different sorts of capital may be used in competition for those goals – the speed of one player, the tactical sense of another. Habitus also has a role to play insofar as each player's perceptions of the world, set of values and habitual patterns of responses affect their play. There is also the fact that players develop a feel for the game by repeatedly playing it. This is seen not only in tactics but also in the way the practices (or repeated patterns of behaviour) of the game become embodied in the player. Thus an athlete develops a physical form that matches and is produced by their patterns of behaviour but embodiment can be seen in other ways too as when professionals in a field adopt the mannerisms, dress and tastes of those around them (Bourdieu, 1984). Players may bring with them a variety of learned habitual behaviours which will contribute to or impede their success in the field. It is so for students making the transition to work. The behaviours and demeanour that worked well for them on campus may not be so successful in the new field and in fact the whole point of the game may be different than they had learned to assume.

In a way, social fields are similar to the sporting field in that for any field there is an agreed target and a set of attributes, skills and so on that are understood to be of value. Over the course of a day and over the course of a lifetime we move through a variety of fields, engaging more or less successfully with the competition for position within the field. In the field of education, for instance, a degree is capital, agreed to be worth something, but the means for gaining it are also capital and these will include intellectual effort and membership of a social network that allows one to draw on the skills and expertise of others. The difference between the football field and the social field is that in football the rules of the game and the behaviours expected of each player are laid down in advance by the game rules. In social life the agreed values and the rules for behaviour are in a constant state of negotiation by the actors:

> *On one side it is a relation of conditioning: the field structures the habitus…On the other side it is a relation of knowledge or cognitive construction. Habitus contributes to constituting the field as a meaningful world, a world endowed with sense and value, in which it is worth investing one's energy.* (Bourdieu & Wacquant, 1992, p. 127)

In other words, a specific field will encourage us to act in certain ways but we always bring with us to the field an unconscious pattern of thought and behaviour, acquired through early socialization and experience in other fields. Whether the field changes us or we change the field, depends on a variety of factors including how highly we value the capital of the field, the nature of the relationships we form within it and the closeness of fit between the capital and habitus favoured by the field and the capital and habitus we use to act within it.

Research question

Our analysis addressed the following question.

> *How do engineering students' descriptions of university and work differ? In particular, how do students' descriptions of capital and habitus in each field differ?*

Data Sources and Analysis

We analysed transcripts of three semi-structured focus groups with students, conducted by the first author at Australian universities in 2013 (N = 6, 6,18) (Male & King, 2019). Focus groups were 50 to 70 minutes in duration.

Context

Focus Groups 1 and 3 were held at universities where students were required to complete 12 weeks of non-credit bearing work experience (mostly engineering-related). At the university where Focus Group 2 was held, students completed internships of 6 to 12 months for course credit. Two of the universities were members of the Australian Technology Network and one was a Group of Eight research-intensive university.

Participants

All but four of the students were expecting to complete their engineering degrees in 2013. Two students had graduated and two students expected to complete their engineering degrees in 2015. All but one were less than 26 years of age. All focus groups included women and international students, except Focus Group 2 in which all students were domestic.

Protocol

In each focus group students were invited to identify "valuable exposure to engineering practice in their degrees, why it was valuable, what and how they had learned from it, how they changed from the experience, and how the experience could be improved" (Male & King 2019, p107). 'Valuable exposure' was not defined – the intention being for students to use their perceptions of value.

Analysis

The transcripts were analysed inductively to identify themes relevant to the research question. Within each theme, comments were analysed to identify examples of capital or habitus in either the university or the work field, and especially differences between capital and habitus in the two fields.

Themes emerging from focus groups

Analysis of the focus group transcripts highlighted four major themes which students reported experiencing during WIL activities. These were the reality of work, mature

communication, accountability, and teamwork. This paper presents findings relevant to accountability, which underpinned all of the themes. In this paper we have discussed accountability. Analysis of the other three themes will be presented in future publications.

Accountability

Engagement with professional practice introduces students to a new field that values different kinds of capital and expects a different habitus from those at university. Just knowing things is suddenly much less valued and knowing which things count is rewarded.

The professional's need to get the right result in the right way made a great impression on students. Students contrasted this with the on-campus attitude that a 60% or 70% result was okay: "there's no 70% in real life" (Focus Group 1). Only knowing 51% counts for nothing. The often half-hearted commitment to work groups and work product often seen on campus needs to be replaced by assumption of responsibility and accountability to fellow workers and clients. While the experience of on-campus teamwork appears to be relatively unstructured, students were very aware that the structured processes of various industries help to ensure good project outcomes:

> *So things like ensuring that the scripts we used to find the defect are stored in the exact state so that you can run them again later. That we don't just say whether it passed or failed but that we have a measurement or something as proof of that and have that archived as well…the whole process of solving a defect – you have to have someone responsible for fixing it and then once they fix it the original tester has to be the one who verifies that it's fixed.* (Focus Group 2)

When such students returned to university they found that their attitudes to teamwork on campus had changed: "And it's definitely changed at uni with classes and assignments and stuff. Before I would just be kind of run around like an idiot and now I'm more right let's get serious and you can hear my voice change when we need to get things done." (Focus Group 2).

This reference to the change in personal bearing (a 'serious' voice) is particularly interesting in the context of Bourdieuvian theory which predicts that underlying values and habitus will be embodied by their bearers. In fact it is through embodiment that values become habitus and practice. We can therefore assume that this student has successfully internalised the culture of the workplace and knows how to operate there. One of the rules for operation in the workplace field is having a professional demeanour, knowing how to conduct oneself and how to communicate appropriately.

This is typical of the way in which a sense of accountability underpinned all of the other differences students noted between university and work. The reality of the workplace was seen not just as getting used to the size, sound and smell of the site, but in things like the absolute requirement to wear safety gear even when on the surface it seemed unnecessary. As the quote above indicates, students who had adapted to workplace notions of teamwork brought that back to campus in prioritising getting the job done to the right standard in the right way. Teamwork became more accountable. They also indicated a newfound appreciation for the fact that poor communication can have significant consequences for key goals such as getting contracts or not, and maintaining community relations. It seems clear then that a focus on accountability has the potential to prepare students better for the workplace.

Discussion

Bourdieu's theory allows us to see students' journeys not just as a matter of acquiring information but of making a shift from one set of values and ways of behaving to another. Classroom WIL modules that contribute to the student-professional journeys have a number of issues to deal with.

WIL activities

Learning outcomes associated with accountability, mature communication and taking responsibility, should be incorporated in meaningful ways into WIL modules that are to be counted as 'engagement with practice'. Learning activities beyond lectures on the subject and instead involving meaningful activity and application are necessary.

WIL assessment

Assessment in the WIL modules should be designed to assess for student achievement of the target attributes and not only content knowledge. That is to say, assessment should focus on how tasks were carried out, for example the quality of communication. This is consistent with the well-recognised principle of assessing teamwork by assessing process rather than output (Besterfield-Sacre, Shuman, Wolfe, Clark, & Yildirim, 2007) and for assessing individual students' learning in teams (Howard & Eliot, 2012; Kaufman, Felder, & Fuller, 2000).

Curriculum integration

It is not necessary that WIL learning outcomes are developed separately from other learning outcomes. Indeed it is likely that WIL learning outcomes can be achieved more thoroughly if integrated into a majority of units throughout the curriculum. Therefore the implications of the findings extend beyond WIL modules.

It has been found that students develop 'accidental competencies' other than intended learning outcomes due to their actual experience of the curriculum beyond instruction (Walther, Kellam, Sochacka, & Radcliffe, 2011). Applying Bourdieu's framework, accidental competency formation could be understood as students recognising capital and developing habitus. Walther et al. identified complex ways that accidental competencies are formed. Their findings could inform the design of features to be integrated throughout curricula to support WIL learning outcomes such as accountability.

Limitations and further research

The focus groups were held six years ago. Although likely to be similar, especially around the identified themes, it is possible that the fields of work and/or of university have changed or are changing. It would be valuable to hold interviews with current students.

Most of the focus group participants were current students. Focus groups with recent graduates would provide perspectives experiences of transitioning into graduate roles.

Important engineering attributes include those related to safety mindsets, ethics, inclusion, sustainability and even empathy (Hess, Strobel, & Pan, 2016; Hess, Strobel, Pan, & Wachter Morris, 2017). In this study we have found that Bourdieu's framework was useful in identifying the change in field that students must prepare for in WIL, especially development of accountability. The framework is helpful for identifying that which is valued in a context. Students might learn to practice safely, ethically, inclusively, sustainably and with empathy during placement WIL in a workplace where the culture is safe, ethical, inclusive, sustainable and empathetic. However, Bourdieu's framework draws attention to the importance of the culture of the workplace. As educators we should be aware of the significance of the capital that students recognise during WIL and the habitus they develop. This means monitoring the values that are part of the cultures in workplaces or simulated in virtual WIL and managing perceptions through informed reflection.

Conclusion

By analysing student focus group transcripts using Bourdieu's framework, we were able to discover that students identified accountability as more important in work than university.

Non-placement and virtual WIL modules should include learning activities and assessment that develop and assess accountability. The Bourdieu framework is likely to be valuable in further describing WIL learning outcomes in practical ways that can be used to inform curriculum development.

Acknowledgements

The focus group transcripts were collected during research supported by the Australian Government Department of Industry, Workplace Innovation Program through a grant awarded to the Australian Council of Engineering Deans. The focus group participants and the partner universities at which the focus groups were held are gratefully acknowledged. Support for this study was provided by the Australian Government Department of Education (Innovation and Discovery Grant ID15-4951), The University of Western Australia, CingleVue International, Curtin University, Engineers Australia, the Australian Council of Engineering Deans, The University of Queensland and Murdoch University. The views in this paper do not necessarily reflect the views of the Australian Government Department of Education and Training or project partners.

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