ENHANCING GRADUATE ATTRIBUTES: MECHANISMS FOR FACILITATING THE TRANSFER OF ACADEMICALLY-ACQUIRED GENERIC SKILLS INTO THE WORKPLACE

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ABSTRACT

This paper explores the ways Arts students may be assisted in acquiring an explicit rather than a tacit understanding of their full range of graduate attributes. With this understanding, the students may be better able to represent themselves when seeking graduate employment and be more proficient at transferring their academically-acquired skills into the workplace.

INTRODUCTION

Universities are increasingly being expected to turn out "work ready" graduates for a contemporary workplace that is demanding an ever-increasing level of multi-skilling and flexibility from employees. As a result, the ability to transfer skills among various contexts is becoming increasingly important (Seltzer & Bently, 1999). These forces have prompted renewed interest in the acquisition of transferable skills. One response to this expectation has been the growing importance placed on the development of generic skills among university undergraduates (Crebert, Bates, Bell, Patrick, & Cragnolini, in press). It is argued in this paper that students are in fact acquiring a range of generic skills within the academy yet are not being sufficiently pressed into explicitly identifying these skills, with the result that the students often under-represent themselves to employers.

A key activity that can serve as a tool in aiding individuals to recognise and recontextualise their skills and attributes is that of structured and guided reflection (Kemmis, 1985). However it would appear to be a process that is under-utilised in universities. This paper draws on findings from the *Workplace Learning Project* (Buckridge, Buckridge, Ferres, &Yashin-Shaw, 2002) conducted in the Faculty of Arts at Griffith University, to propose mechanisms by which students may acquire an explicit rather than a tacit understanding of the full range of their graduate capacities. The project used students' paid, part-time work as a context for examining the application of academically-acquired knowledge and skills. The theoretical framework of the paper draws on and synthesises current literature related to the transfer of learning and the development of generic skills in undergraduates.

THEORETICAL FRAMEWORK

Traditionally, much university teaching has been directed at the teaching of abstractions so that the knowledge acquired may be generalizable and not context bound. However, if students then have difficulty in applying these abstractions in non-academic contexts, or "if abstractions are not understood in such a way that they can be related to new contexts, then they suffer from a lack of, what cognitive psychology denotes as, transfer" (Yashin-Shaw & Stevenson, 2003). For this reason a number of cognitive researchers such as Collins, Brown, and Newman (1989), and Brown, Collins, and Dugiud (1989) have argued that students are better served if they learn abstractions from multiple contexts rather than learning them directly. However, given that much university learning is – by nature – decontextualised by virtue of the fact that it takes place in lecture theatres and seminar rooms, what mechanisms are available to university educators to help students ground their decontextualised learning into contextualised experiences? Van Oers (1998) proposes a framework by which to investigate this issue. He argues that generalizability is achieved not through decontextualisation of knowledge but rather through recontextualisation which involves "contextualising something in a new way" (Van Oers, 1998, p. 483). Rather than "freeing" knowledge from situational constraints (thereby supposedly making it more generalizable), generalizability is more likely to be achieved when knowledge is transformed through being used iteratively in different contexts and for different purposes.

University students find themselves in different contexts as part of their day-to-day lives. For example, an ever-increasing number of them

have part-time work, and therefore they transit regularly between academic and non-academic contexts. They therefore have the opportunity to recontextualise their academic knowledge and understanding in non-academic contexts and vice versa. Unfortunately, however, this does not happen automatically. Indeed, as Marshall and Cooper (2001) have shown, there is no easy or automatic connection between students' academic study and their world of work. They have little sense of how to construe anything that they are doing at their work as a skill that has any particular form or that has been transferred from any other context, let alone that of the academic classroom. Understanding of how knowledge is recontextualised is most likely to happen when activities in different contexts are "consciously reflected on, often struggled with and the eventual outcome changes one's sense of self and social positioning" (Beach, 1999, p. 114). Beach (1999) has coined the term "consequential transitions" to refer to the transformative nature of experiences across different domains and environments which give rise to generalizations as well as new conceptions of "knowledge, identities, ways of knowing as well as new positionings of oneself in the world" (p. 113).

Helping learners to acquire the tools by which they may examine these transformations and understand the ways in which they may be able to recontextualise their knowledge is important. It can empower undergraduates with a sense of confidence in their ability to adapt to different contexts – be they academic or non-academic – by reconstituting, refocussing, and repackaging their knowledge. This is essential in a workplace characterised by transition and change and where graduate employment options may not be clearly defined. Explicit identification by Arts students of how they transfer their acquired capacities between academic and non-academic contexts is likely to enhance their success in graduate job seeking and make the value of their Arts degree more visible to prospective employers.

It is argued in this paper that one mechanism for doing this is to provide students with the space, opportunity and, indeed, the press to reflect on and struggle with the activities in their lives which give rise to consequential transitions. Acknowledging that students are busier than ever because of their part-time jobs and therefore less likely than ever to take time out to reflect, it would be a good idea to build time into the curriculum when this can be done. Because the kind of reflection that effects change and transformation is often difficult and discomfiting, students are more likely to engage in it only if pressed. Furthermore, for it to be effective and purposeful the reflection needs to be deliberate, structured, and guided (Boud, Keogh, and Walker, 1985). This opportunity (and associated conditions) were provided by the introduction of a new course in the Faculty of Arts at Griffith University entitled *Learning and the Workplace*. It was the culmination of the *Workplace Learning Project* undertaken in the Faculty of Arts at Griffith University over 2002-2003.

The aim of the project was to help Arts students explicitly identify the full range of skills they had acquired at university. Arts students traditionally do not undertake formal work placements as do students in other faculties with more vocationally-orientated degrees. They therefore are not afforded the opportunity to apply their academically-acquired skills and knowledge (acquired in a relatively abstract and decontextualised way at university) in an authentic workplace context that carries academic credit. Nonetheless, many of these students work, often long hours, in some form of paid part-time employment. The course, *Learning and the Workplace*, sought to use this employment as a context for helping students to identify the full range of academically-acquired skills they had at their disposal and ways in which they transferred this knowledge between academic and workplace contexts.

METHODOLOGY

In the first stage (Stage 1) of the Workplace Learning Project, which took place in Semester 1 of 2002, voluntary participants for the research were sought from among third year humanities students enrolled in a Bachelor of Arts degree to provide case-based qualitative data. Students needed to have been engaged in some sort of part-time work for at least six months. Twenty students volunteered to participate in the project. Each of them was interviewed one-on-one for approximately one hour for the purpose of identifying ways in which they were applying their academically-acquired capacities – both arts-specific and generic – within the workplace; ways in which their workplace experience may serve as a alternative to work placements of the kind available to students in other more vocationally inflected degrees; and links and

connections between their academic and non-academic contexts.

Each interview was a combination of structured and unstructured approaches advocated by Qureshi (1992) as being suitable for "applied research" which is "research directed toward practical use within certain policy or problem areas, undertaken by researchers employed or contracted by policy makers" (p. 105). The research being reported in this paper was not primarily for the purpose of generating theory but to illuminate a range of considerations associated with students' acquisition of generic skills through studying a liberal-arts degree and the application of these skills in their existing part-time work as a preparation for graduate employment. Furthermore, the outcomes of the study led to changes in practice i.e., the introduction of a new undergraduate course called *Learning and the Workplace* specifically designed to provide students with the opportunity for extended and scaffolded reflection. The value of the opportunity for reflection provided by the course is discussed in the following section.

The core of each interview covered a number of predetermined questions and considerations such as the following.

- Referring to the list of generic graduate capacities (Table 1), identify ways in which you use these capacities in your part-time work.
- Think of some specific problem or difficulty you encountered in your workplace recently. Identify which skills you used in dealing with it explaining how you were able to identify these skills in action.
- Identify ways in which the skills you have discussed in the previous question have been developed through your academic studies.
- Identify some specific content knowledge from your university courses that you have applied in your part-time work.
- In what way has the experience of simultaneously being a student and a worker informed your understanding of both contexts?

GENERIC GRADUATE CAPACITIES	
Cognitive	Ability to : • think critically (including the ability to critique existing paradigms i.e., question accepted wisdom), • think creatively, • think analytically, • problem-solve (including identification and problem definition), • analyse and critically evaluate.
Social	Ability to : • communicate effectively - in both oral and written form, • work effectively and collaboratively as a member of a team, • assume responsibility and make decisions, • be sensitive to and appreciate differences in gender culture and customs, • value truth, accuracy, accountability and a code of practice.
Personal/ attitudinal	Ability to : • initiate and lead enterprises, • commit to life-long learning, • be self-reliant, • be reflective, • engage in self-assessment and analysis.
Technological	Ability to : • use a wide range of technology (e.g., www and electronic databases) to locate, evaluate, and manage information, • be confident in the use of computers for various purposes and outcomes.

Table 1. Generic graduate capacities.

There was also opportunity for more open-ended discussion and generative questioning during the interview process. These opportunities were designed to help students "unpack" responses which were likely to yield useful information. Too structured an approach was likely to "inhibit the free expression of feeling or the expression of unanticipated responses" (Qureshi, 1992, p. 109). Too highly unstructured an interview might not have sufficiently pressed students into unpacking their repertoire of transferable skills – especially considering that students were being asked to think about associations and applications of their knowledge, which they may not have considered previously. Prompting or assistance was provided where necessary to assist students to access and verbalise some of their tacit knowledge.

The interviews were audio-taped, transcribed and analysed according to six major themes. These were students' knowledge of generic capacities; how generic skills are developed in students enrolled in Arts courses; the value of BA studies in the part-time workplace; how part-time work undertaken by Arts students may serve as a work placement experience to develop work readiness; the complementarity of Arts studies and part-time work in preparing students for future employment; student perceptions about the value of studying Arts. The data collected were used as a basis for formulating ways of adding value to students' Arts degrees. No claims to generalizability of findings are made. Given the small number of participants (N=20) and the fact that they were acquired by voluntary participation rather than random sampling,

The second stage (Stage 2) of the project involved the introduction of the *Learning and the Workplace* course as a pilot offering in the Arts Faculty, with enrolments being drawn from those students who had participated in Stage 1. The aim of the course was to formally continue the opportunity for structured and guided student reflection initiated in the interviews conducted in Stage 1. Five students enrolled in the course. Stage 3 of the project, which took place in Semester 2, 2003, involved a revision and expansion of the pilot course which was then offered to all Arts students. Six students enrolled in the course. Feedback from students as part of the course evaluation was also used as data, the relevant aspects of which are reported in the following section. In Semester 2, 2004 the course will be available to students as an elective on a university-wide basis.

The *Learning and the Workplace* course focuses on explicit identification of the full range of generic skills acquired by students, the origins of the skills, their current applications, and their future usefulness. Central questions with which students engage include the following. What are generic skills? How have they been developed in the courses students have undertaken? How are they being used currently in students' existing part-time work? How will the identification of this transfer of academically acquired knowledge into existing work aid in the preparation for, and success in, graduate job seeking and employment? How does the continual transition between university and work and vice versa transform the individual student's understanding of his or her capacities?

All three of the assessment items in the course require students to engage in various forms of extended, structured, and guided reflection and documentation. The significance of such activity and the implications for the students participating in the study are found in the Discussion section.

RESULTS

Student feedback on the course at the end of Stage 3 in Semester 2, 2003 was part of the data gathering process. Extracts from comments are reported below from each of the six students about the experience of scaffolded reflection provided in the course.

> The reflective journal entries forced me to do something I wouldn't have chosen to do on my own. It was the first time I'd done anything like it and it took me a while to feel comfortable with it. But that, in conjunction with the major assignment, really made me explore the full range of my skills. I used to think only very generally about them but now I realise I am capable of so much more. (Student 1)

> I learnt to vocalise links between what I was doing at university and what I could do in my future career. This not only helped to clarify my directions but also made me more adept at talking about my skills, which will be very useful in interviews. (Student 2)

Analysing our experiences in the way we did helped me to understand that particular skills can be transferred into many different contexts. I realise now that there are limitless possibilities. I feel much more prepared for and confident about graduate employment. (Student 3)

The course encouraged me to look reflectively at myself. The process of examining different skills and reflecting, vocalising and writing about their links and transferability, allowed me to have a clearer picture of my evolution as a learning creature. (Student 4)

Having to think about what I do at university and how it applies in the workplace has helped me to see the bigger picture of what I'm doing here. I used to only think about passing the course but not thinking about how it's going to help in the long term. (Student 5)

The assessment items made me think about my abilities in a way that I have never done, or needed to do, before. I have a different understanding of myself and what I am capable of. The course has boosted my confidence tremendously. I have already found graduate employment in a field I would never have thought I would have had a chance in. The insights gained from this course have been invaluable. (Student 6)

It would seem, from the above feedback, that, for the students enrolled in the course in 2003, the press to reflect was a somewhat novel, though ultimately, rewarding and valuable experience for them. The process of reflection appears to have changed, to various extents, the way they think about themselves and their abilities. The usefulness of such an activity is discussed in the following section.

DISCUSSION

There are different mechanisms for helping students to become more consciously aware of the full range of their skills. The most obvious is to embed them within the curriculum and to explicitly identify, teach, and assess them. Griffith University's *Griffith Graduate Project*

is currently engaged in this undertaking. However the subject of this paper is the initiative in The Arts Faculty at Griffith University which has seen the introduction of the course *Learning and the Workplace* to cater for students who cannot formally engage in work placement. Thus far, only eleven students have completed the course. In 2004 the course will be available on a university-wide basis and it is anticipated that more students will enrol – especially those from disciplines which do not provide a formal work placement.

The cornerstone of the *Learning and the Workplace* course is the opportunity it affords students to reflect on their experiences as part-time workers and full-time students. Such an activity may well deliver rewards to undergraduate students who, according to Marshall and Cooper (2001), have limited experience and success in using reflection to make connections between their academic and non academic experiences. It is argued in this paper that it is the activity of reflection that forges the links within students' understandings of the various contexts across which they operate, thereby promoting a deeper understanding of each context. However, as Marshall and Cooper (2001) observe, it is essential that students are pressed into, aided, and given the opportunity for such reflection.

The course *Learning and the Workplace* provided the scaffolding students needed to make their transitions between their academic and work contexts "consequential" (Beach, 1999). To some extent the course is a response to the gap that the literature suggests exists between higher education and the world of work. Through structured and guided reflection students can be encouraged to forge explicit links between the various experiences in the different contexts in which they find themselves. Reflection then may be, for some students, a key activity by which to add value to their learning both within and outside the academy. It is this activity that has the potential to help them to gain facility with recontextualising their knowledge. "The capacity to reflect is developed to different stages in different people and it may be this ability which characterises those who learn effectively from experience" (Boud, Keogh, & Walker, 1985, p. 19). The benefit of reflection is hardly a novel concept for educators who for centuries (since Plato) have espoused the transformative power of such activity. Yet a number of students in the *Workplace Learning*

Project reported that they rarely engaged in active, structured, or guided reflection in the usual course of their academic studies; this is illustrated by the extracts in the previous section. It was hardly surprising therefore that some students initially found it difficult and even discomforting to undertake the kind of thinking required for the *Learning and the Workplace* course, yet having done so found it extremely valuable. This is also illustrated by the student feedback in the previous section.

Most of the students who enrolled in the course (both in 2002 and 2003) did so in their penultimate semester. Many of them said that, having seen the benefits of developing a reflective approach to their learning, they wished they had been encouraged to do this sooner. It would be ideal if students were required to formally engage in some form of reflection at the end of all their courses to identify the extent to which they have acquired the skills targeted in the course. In the short term it may help students to see how different courses articulate with each other and build on and inform each other, instead of viewing each course as a discrete unit which can be neatly put aside at the end of the semester. In the long term it could help students be more flexible in the workplace by encouraging them to use reflection as a means of recontextualising their knowledge.

CONCLUSION

Graduates who are able to explicitly identify their generic skills and to understand how they have acquired them and how they are already using them, are more likely to be able to recontextualise and repackage them. Structured and guided reflection is an important mechanism by which to facilitate the transfer of academically-acquired generic skills into the workplace. This paper has drawn on findings from the *Workplace Learning Project* at Griffith University to argue that students acquire a range of transferable skills at university that are often under-recognised (by both themselves and potential employers). One possible reason for this is that students do not generally engage in a process of reflection designed to help them explicitly identify the way they use the full range of their abilities in non- academic contexts such as in their part-time work. When students are pressed into undertaking such an activity, their understanding of themselves, their capacities, and subsequently their abilities to engage with different contexts, can be

transformed. It affords them the opportunity to identify the ways in which they can continually reconstitute their knowledge, making it possible to transfer their skills across multiple domains. Such an understanding is invaluable for graduates entering a workplace characterised by change, where those able to be flexible, adaptable, and multi-skilled are most likely to succeed.

REFERENCES

Beach, K. (1999). Consequential transitions: A sociocultural expedition beyond transfer in education. In A.Iran-Nejad & P. David Pearson (Eds.), *Review of Research in Education* (pp.101-139*)*. Washington DC: American Educational Research Association.

Boud, D., Keogh, R., & Walker, D. (1985). Promoting reflection in learning: a model. In D. Boud, R. Keogh, & D. Walker (Eds.), *Reflection: Turning experience into learning* (pp.18 - 40). London: Kogan Page.

Brown, J. S., Collins, A., & Dugiud, P. (1989). Debating the situation: a rejoinder to Palinsar and Wineburg. *Educational Researcher, 18*(4), 10-12.

Buckridge, P., Buckridge, M., Ferres, K., &Yashin-Shaw, I. (2002). *Workplace Learning Project: A strategic improvement initiative*. Unpublished Report. Griffith University.

Collins, A., Brown, J. S., & Newman, S. E. (1989). Cognitive apprenticeship: Teaching the crafts of reading, writing and mathematics. In L. B. Resnick (Ed.), *Knowledge, learning and instruction, essays in honor of Robert Glaser* (pp. 476-494). Hillsdale, N.J.: Erlbaum & Associates.

Crebert, G., Bates, M., Bell, B., Patrick, C., & Cragnolini, V. (in press). Developing generic skills at university, during work placement and empoyment: Graduate perceptions. *HERD*.

Kemmis, S. (1985). Action research and the politics of reflection. In D. Boud, R. Keogh, & D. Walker (Eds.), *Reflection: Turning experience into learning* (pp.139 – 163). London: Kogan Page.

Marshall, I., & Cooper, L. (2001). Earning academic credit for part-time work. In D.
Boud & N. Solomon (Eds.), *Work-based Learning* (pp. 184-199). Buckingham: SRHE and Open University Press.

Qureshi, H. (1992). Integrating methods in applied research in social policy: A case
study. In J. Branned (Ed.) *Mixing Methods: Qualitative and quantitative research* (pp.101-125). Avebury: Aldershot.

Seltzer, K. & Bently, T. (1999). *The Creative Age: Knowledge and skills for the new economy*. London: Demos.

Van Oers, B. (1998). From context to contextualisation. *Learning and Instruction, 8*(6), 473-488.

Yashin-Shaw, I., & Stevenson, J. (2003). Using re-contextualisation to build links between humanities studies and students' part-time work. In J. Searle, D. Roebuck, and I. Yashin-Shaw (Eds.), *Enriching Learning Cultures. Proceedings of the 11th Annual International Conference on Post-compulsory Education and Training* (pp.198-203). Brisbane: Australian Academic Press Pty. Ltd.

Yashin-Shaw, I., Buckridge, M., Buckridge, P. & Ferres, K. (2002). How relevant is a liberal arts degree in an increasingly vocationalised higher education sector? In J. Searle & D. Roebuck (Eds.), *Envisioning Practice - Implementing Change* (pp. 221- 228). Brisbane: Australian Academic Press Pty. Ltd.

USING PROBLEM-BASED LEARNING IN A SECOND YEAR CHEMICAL ENGINEERING INFORMATION-SKILLS WORKSHOP – AN AUSTRALIAN CASE STUDY

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ABSTRACT

Problem-based learning has been widely used in engineering education. This paper outlines the use of problem-based learning in an information-skills workshop for second-year chemical engineering students. The workshop and the learning outcomes are evaluated, and the results and the implications for future practice are presented and discussed.

INTRODUCTION

Problem-based learning (PBL) is "a way of constructing and teaching courses using problem as the stimulus and focus for student activity" (Boud & Feletti, 1997). It promotes critical thinking, problem solving, and self-directed learning skills, and encourages students to become lifelong learners. It emphasises the process of learning, with students taking control of their own learning, and learning how to learn (Swanson, Case, & van der Vleuten, 1997). Dahlgren (2000) described the characteristics of PBL:

> The idea of problem-based learning can be described in the form of three distinctive features. Firstly, real life situations constitute the starting point for the learning; secondly, the learning is self-directed; and thirdly, the basic work form is the tutorials, where 5-7 students work together in a group with a tutor. (p. 31)

PBL has been widely used in engineering education because it meets the demand of the engineering profession in the real world (Chung, Harmon, & Baker, 2001; Green & Kennedy, 2001). Johnson (1999) claims that lecturing as a sole teaching technique has repeatedly been shown to be ineffective. Ditcher (2001) in his article argues that problem-based teaching overcomes shortcomings in traditional teaching in engineering.

In information-skills teaching, people have begun to design teaching methods that reflect this approach. Carder, Willingham, & Bibb (2001) described the advantage of the cased-based problem-based learning (CBPBL) approach as follows:

> The primary advantage of CBPBL is that students have the opportunity to apply library skills to the solution of meaningful problems, which makes the concept of information literacy immediate and relevant …. (p.189)

The objective of this study is to critically evaluate the outcomes of an information-skills workshop that used a PBL strategy.

THE WORKSHOP

One of the second year chemical engineering courses at the University of Queensland (UQ) was designed on PBL principles. Students undertook projects that had problems drawn from real-life experiences with outside companies working closely with the Chemical Engineering Division in the university. Students were required to undertake two team-based projects. Project 1 was to analyse the flowsheeting and process system for the manufacture of formaldehyde. Project 2 was also a team-based investigation of a "local" process industry and of professional engineering careers in this industry. For both projects,