‘The confidence to do things that I know nothing about’ – skills development through extra-curricular inquiry activity: a literature review

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The following literature review outlines three key themes relating to students’ skills development and participation in extra-curricular inquiry activities in higher education. The full article, which presents the findings of a survey given to students engaging in educational enhancement activities in inquiry/enquiry-based learning at two Centres for Excellence in Teaching and Learning (CETL), was published in the *Journal of Learning Development in Higher Education,* Issue 3: March 2011

Literature review

Transferable skills in higher education

In creating an overview of skills development in higher education (HE), Atkins (1999, p.268) describes the confusion about nomenclature, with terms like 'enterprise', 'core', 'key', 'common', 'transferable' and 'generic' used virtually interchangeably in research literature and policy documents. Similarly, the meaning of different types of skill (e.g. personal, process, technical, etc.) often remains undefined. It has been suggested (Bathmaker, 2007) that the government’s 'Skills for Life' strategy, which focuses on literacy, language and numeracy skills, is obsolete and that 'learning to learn' is the main key skill entrants to employment need to possess. Froman (1999) argues that a changing society necessitates a change in how universities are managed and supported, shifting the

focus towards multi-disciplinary programmes and problem-solving teams, creating a learning community rather than neatly compartmentalised subjects.

Burke et al. (2005) argue that, despite the amount of literature available on skills development, little research has been completed into students' perception of these skills, their transferability, and indeed their usefulness. Haigh and Kilmartin (1999) further stress the importance of raising skills development with students, rather than assuming they will be aware of transferable skills needed as part of their studies. Bennett (2002) analysed 1,000 job advertisements over two years and synthesised the key skills required by employers as: communication skills, initiative, creativity, problem-solving, team-working and leadership. Similarly, Davies (2000) reported on a series of government documents from the 1990s, which outline key skills necessary for employment. These capabilities focused, above all, on process-oriented and self-management skills rather than specific functional and/or disciplinary skills. Whilst the higher education sector is doing well in promoting some of these skills, employers lament shortcomings in graduates' skills in some areas, particularly decision-making, team-working and communication (see e.g. Nabi and Bagley, 1998), making it difficult for graduates to fit straight into employment, and necessary for employers to engage graduates in additional training (Athiyaman, 2001).

Cranmer (2006) raises the issue of when might be the best time to inquire into students' skills development. The first opportunity comes before graduation, when students are only likely to be able, at best, to second-guess what skills they might need for employment. The second opportunity comes once students have started employment, when the university experience may have been 'watered down' through work-based training. Both of these opportunities for gathering information thus offer benefits and present challenges to the researcher, which, if they are not taken into account, can result in a slanted perception of students' skills development.

Skills development and inquiry-based learning

Substantial work has been carried out on the skills which students develop by participating in problem-based learning (PBL), a sub-category of inquiry-based learning (IBL). In the context of health sciences, Smith and Coleman (2008) warn against the simplistic assumption that PBL will automatically equip students with the skills necessary for employability, and highlight the need for careful guidance to ensure students are aware of

the higher demand PBL places on learning, in order to avoid negative attitudes. Students have been seen to develop a range of capabilities through PBL, including: entrepreneurial and networking skills (Birtwistle, 1998), information literacy and independent learning skills (Schilling et al., 1995; Ryan, 1997; Oker-Blom, 1998; Chambers, 2002), literacy (Gerdes and Lewis, 1999), problem-solving skills (Nathanson, 1994, 1996; Keyzer, 1995; Smith et al., 1995; Ryan, 1997; McTiernan et al., 2007), and subject knowledge (McTiernan et al., 2007). However, the specific link between IBL and students' skills development is less well understood (Khan and O'Rourke, 2004 for general comments); although work examining the impact of PBL and IBL has been increasing in recent years (see e.g. Schraw et al., 2006, p.118, for links between inquiry-based pedagogies and students' meta-cognitive and self-regulation skills).

In examining the impact of IBL upon professional skills in three professional programmes (Pharmacy, Electrical and Electronic Engineering, Computer Science) at the University of Manchester, Powell et al. (2007) concluded that IBL successfully developed a range of professional skills. The capabilities which were developed included skills in: teamwork, leadership, interpersonal relations, research, academic knowledge, problem solving, presentations, communication, problem-definition and problem-solving, project management and planning, information searching, and giving feedback. There were some problems surrounding teamwork and project management. For example, some students became disillusioned because members of their team were not pulling their weight and this had a negative impact on their plans for the project. Other students enjoyed and benefitted from the process of working with others. Both staff and students recognised that these projects were only the first stage of a longer process of skills development and that their capabilities would develop as they gained more experience. The authors suggest that this argues that the students are exposed to IBL on a more sustained basis to allow them to develop these transferable skills across the rest of their degrees.

There have also been studies that have examined the role of IBL towards the end of students' time in higher education. For example, the Faculty of Life Sciences at the University of Manchester developed a final year enterprise project that was based on IBL principles and explicitly designed to develop a range of transferable skills (Henery et al., 2008). This was a response to the fact that students from the faculty were no longer taking up careers in which subject-specific knowledge and skills were critical. The inquiry-based enterprise project was therefore developed in order to develop transferable skills that

would enhance students' employability, at the same time as improving their subject knowledge. Research and evaluative activity carried out in the course of the project suggests that the students did indeed improve a range of transferable skills at the same time as developing dispositions that would be beneficial in the world of work:

> The majority of students felt that they had developed skills such as confidence, initiative, data-mining, task management, organisation, decision making and task planning. A smaller majority felt that they had developed other skills, such as perseverance, problem solving and networking, while only half felt that they had developed skills in creativity, time management (in practice) and flexibility. (Henery et al., 2008, p.98)

Braye et al. (2003, p.490) note the valuable potential of inquiry-based approaches for developing, in students of social work law, the capability of moving from deductive to inductive learning processes: 'from mechanistically 'applying knowledge' to practice to seeking knowledge for a purpose, and integrating it within an ethical practice framework'. IBL thus provides students with a range of underpinning skills to deal with a rapidly changing discipline that will be further consolidated in practice-based learning. Reynolds et al. (2006) is one of the few studies to look at the positive impact of IBL and PBL upon students' disciplinary domain knowledge, concluding that IBL and PBL developed a range of independent learning and team-working skills and aided in the acquisition of deeper subject knowledge, noting at the same time that cohort culture, small group interaction and student ability levels were potential limiting factors.

Although there is a growing recognition that curricular IBL activity develops a range of subject-specific and transferable skills in students, there is virtually no literature on how extra-curricular activities, whether IBL-related or not, might influence skills development. Indeed, whilst Cranmer (2006, p.172) stresses that current research 'casts doubt that [transferable] skills can be effectively developed inside classrooms', her proposed solution is linked to work-based learning, overlooking extra-curricular activities as part of the puzzle. Some literature is available, especially in more applied subjects (e.g. Owen, 2001), but this is once again located within one particular discipline.

Extra-curricular activity, academic achievement and skills development

The literature on the impact of extra-curricular activities on students' academic performance and skills development is somewhat ambiguous. Some studies report a positive correlation between the two, with participation in extra-curricular activities and/or paid work positively influencing educational achievement, student retention and skills development (Astin, 1999), while others conclude that there is little relationship between the two. The effects of the degree of adult supervision which students receive and the extent to which they carry out their activities in groups are further differentiating factors (Feldman and Matjasko, 2005). Even in the case of more structured activities, the research is far from conclusive (Gilman et al., 2003); although the evidence is largely supportive of a positive association between such activities, student engagement, skills development and academic achievement, at least at the school level. Curtis and Shani's (2002) study of student perceptions of the impact of paid employment on academic studies at Manchester Metropolitan University showed a fairly even distribution of opinions on the topic: 35% of students felt that paid work impacted negatively on their studies, 30% felt that it helped their academic studies, and 35% felt that it had no effect. A number of studies of student engagement in extra curricular activities have noted that it can increase the students' sense of belonging and affiliation with the institution, facilitating a more over-arching attitude towards skills development and learning (Bringle and Hatcher, 1996). Overall, therefore, it appears that further research into these correspondences is necessary before any definitive conclusions are reached.

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