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Eportfolios in the Sciences: The Role of Reflection as students build professional skills and career readiness

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This poster presents a series of UNSW LTU seed funding grants that explored a program-wide approach to using ePortfolios as a reflective learning process together with the need for life-long and life-wide learning alongside career goal setting. ePortfolios were selected as the learning technology for these studies as they provide a cohesive and reflective space to enable a student to reflect upon and understand different ways of operating and possible new directions for their learning. In higher education more recently, there has been a growing imperative to have a portable record of work undertaken across a number of areas of endeavor in a student's academic life for assurance of learning. A Mahara ePortfolio serves several important functions with this in mind; it allows for integration of reflective elements, in the Journal, with career-oriented elements, including the articulation of academic and personal skills, plans and the Resume; it records past and current practice for reflecting upon practice to effect change, and acts as a change agent by enabling long-term on-going evaluation of student performance and associated learning outcomes.

Keywords: ePortfolios; Mahara; reflection; reflective practice; medical science; advanced science; higher education; careers.

Newman & Wehlage (1993) identified five key standards or benchmarks that support the development of deeper learning when designing curriculum for student learning:

- Higher order thinking;
- Depth of knowledge;
- Connectedness to the real world;
- Encouragement of substantive conversation between students and between students and their teachers, and;
- Social support for student achievement.

This approach to implementation in Medical Science and Advanced Science core courses includes these key standards of Newman & Wehlage alongside self-awareness and career development learning (Stanbury, 2005) to make explicit to students the relevance of the ePortfolio for their current studies and future careers. The connectedness to the real world includes authentic learning and assessment in the course and after graduation when the ePortfolio can play a role that supports the 'practice' of skills (Brown, 2003) in the workplace.

Building Professional Skills and Career Readiness in the Sciences

These pilot projects in their individual courses in Medical Science and Advanced Science use an ePortfolio to develop self-awareness in relation to course content through reflection and career goal setting. Beyond a single course, the project seeks to build professional skills and career readiness in the sciences on a wider program level. This we believe will provide a platform for holistic development and assessment of a range of graduate capabilities both academically and socially, while helping to support and develop student's self and career awareness, readiness and graduate employability. This pilot involves approximately 510 students across selected Science, Advanced Science and Medical Science courses.

Life long and life wide learning

ePortfolios enable both a self-directed and an individualized approach to learning that can promote life-long capabilities and can enhance students' professional preparedness in science by approaching the learning experiences through an orientation of process rather than product. As these students engage in reflection upon the relationships between their educational experiences, in each of the courses, they are developing both personal and professional future career aspirations, aptitudes, and opportunities. As students develop the appropriate skills to self regulate their learning and become responsible for their learning, they can engage both individually and collaboratively in the ePortfolio. This highlights and makes clear the interrelatedness of learning processes, knowledge and skills that the students gain across a degree program.

The fundamental outcomes of using ePortfolios can be summarised as follows. Students are encouraged to collect, select, reflect and connect. *When developing personal ePortfolios* students are supported to develop skills that enable them to:

- self regulate learning and become responsible for their learning beyond the walls of the classroom; and,
- engage both individually and collaboratively using ePortfolio.

In this setting, students learn to critically review the work of others and gain an insight into the varying qualities and standards of work in the course. This also helps students to identify quality in their own work and that of their colleagues as they develop an understanding for the standard required.

Career development learning and ePortfolios in the Sciences

Career development learning (CDL) is a process that "empowers individuals to identify, develop and articulate the skills, qualifications, experiences, attributes and knowledge that will enable them to make an effective transition into their chosen futures, and manage their careers as lifelong learners, with a realistic and positive attitude" (Stanbury, 2005). It is both a transdisciplinary process and a subject discipline with its own history, evidence base, theoretical frameworks and methodologies.

The goal of career development learning is to help students to acquire knowledge, concepts, skills and attitudes which will equip them to manage their careers, their life-long progression in learning and work (Watts 2006). Reinforcing the intention of this outcome, the Bradley review for the Australian Government listed an expectation that higher education should "produce graduates with the knowledge, skills and understandings for full participation in society and the economy."

Although there are different theories and developmental approaches to careers education, the most widely used framework by career centres around the world is the DOTS model. The basic assumption underpinning this model is that effective career learning is composed of a dynamic relationship between Self, Opportunities, Decisions and Transitions (DOTS) (Watts, 2006). These four elements involve:

- self-awareness - the ability to identify and articulate motivations, skills, and personality as they affect career plans;
- opportunity awareness - knowledge of opportunities and the ability to research these;
- decision making - being able to weigh up personal factors to make a sound plan, and;
- transition learning - understanding of how to seek and secure employment opportunities.

Discussion and Conclusion

This poster presents how this project has arisen through the combined interests of educators and career advisors. Together we have identified opportunities to address the UNSW Graduate Capabilities through the introduction of ePortfolios. This study is appropriately staged such that graduates should develop career pathway awareness, begin to reflect on the transferable and technical skills acquired throughout their undergraduate studies and address any weakness that might hinder their ability to achieve their career target. Together, these elements can help fortify student career awareness by encouraging students to consider their work interest areas, career paths and decisions, employment opportunities and attitude for career success. Students also learn to consider what recruiters are seeking and strategically devise a plan to achieve their career goals.

It is not enough, in times of evidence-based education practices, for students to simply claim, at the end of their programs of study, that they have achieved capabilities of Scholarship, Leadership, Professionalism and Global Citizenry. They are now required to substantiate such claims with clear records of achievement. EPortfolios offer students the perfect opportunity to both record and enhance their professional skills and tailor them to the workforce in which they will practice. Further it will enable the University to warrant the claims of its Graduate Capabilities through the students' own acknowledgements of achievement. It further seeks to explore the often-tenuous relationship in higher education between the 'hard' and 'soft skills' where careers and employment, learning and teaching unit, teaching academics and science researchers have developed a project with the principal aim:
That by providing a portfolio platform and digital repository for holistic development and assessment of a range of graduate capabilities both academically and socially student's career awareness, readiness and graduate employability can be enhanced and improved.

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