

THE IMPLEMENTATION OF A UNIVERSITY-WIDE ELECTRONIC REFLECTIVE JOURNAL TO FACILITATE THE DEVELOPMENT OF CORE SKILLS

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Abstract

The University of Newcastle, in 2001, surveyed 600 employers of recent graduates of the University to identify those qualities desirable in graduates. From the survey ten competencies, which employers regarded highly, could be clearly identified. These ten competencies aligned closely with, and thus reinforced, thirteen Core Skills developed by the university for implementation throughout the institution. The process of implementing the Core Skills is a four-year project of the University, which will involve each School ensuring that the Core Skills are an integral component of all academic undergraduate programs. This paper documents the activities of four Schools in addressing the issues of supporting the integration of the Core Skills into their programs. The Schools have developed a prototype of an online reflective journal which supports students in documenting their progress in attaining the Core Skills and competencies of their respective disciplines. As well as describing the development of the Core Skills and the NURAPID project, the paper reports on issues encountered in developing the project.

Keywords

reflective journal, undergraduate education, core skills, discipline skills, competencies, online portfolio, lifelong learning

Introduction

The University of Newcastle recognises that the community, in general, and employers, in particular, have expectations of skills of university graduates, whatever their field of study. The University itself has particular expectations which define the nature of a university education and university graduates, and distinguishes them from the curricula and graduates of other institutions. To delineate this distinction the University has defined those skills and qualities which should be common to all of its graduates.

The University has begun the process of integrating a defined set of core skills into all its academic programs. This process will take approximately four years, aligning with an internal program review cycle. Four disciplines of the University; Building, Nursing and Midwifery, Education and Software Engineering, have been the first to respond to the need to integrate the University Core Skills into the programs. To support the inclusion of the Core Skills into their programs these disciplines are implementing this through the development of an online reflective journal. These Disciplines are the professional groups involved in the NURAPID project, the reflective practice online journal.

University Core Skills

The University has endeavoured to encapsulate in the statements of its core skills the attributes that society and, more specifically, employers desire of its university graduates. The university established its list of core skills through an extensive process of interaction with faculties. The skills documented in the University list were endorsed through a survey of 600 employers of University of Newcastle graduates. The employers reinforced the choice and diversity of the generic skills identified by the University. The major task of the University is now to contextualise these skills into individual programs and to ensure that students receive instruction, feedback on progress in their acquisition, and evaluation of their performance of these skills. The core skills are listed in Table 1.

Graduates of The University of Newcastle will have demonstrated that they are able to:
1 Operate effectively with comprehensive and well-founded knowledge, skills and ethical standards appropriate to their fields of study;
2 Acquire, organise and present information;
3 Reflect on and continue to develop their knowledge, skills and attitudes;
4 Think logically, laterally, critically and creatively; analyse and synthesise;
5 Act effectively in decision-making and problem-solving;
6 Carry out research activities;
7 Communicate effectively as members of their communities;
8 Work autonomously and collaboratively;
9 Utilise information technology appropriately and competently;
10 Seek improvement in organisational, social and cultural contexts, in an ethical manner;
11 Recognise social, cultural, physical and intellectual diversity, including the history and diversity of Australian indigenous peoples;
12 Recognise and respond appropriately to globalisation and other changes of context; and
13 Recognise human impact on the environment, and its implications for environmental sustainability.

Table 1: 'Core Skills' of graduates of the University of Newcastle

The Role of Reflective Practice

Fundamental to the acquisition of skills is the process of internalising skills through their application in the context of the profession in which a student is studying. The role of reflective practice is integral if students are able to progressively relate these skills to real world applications. Candy, Crebert & O'Leary (1994) in their report "Developing Lifelong Learning through Undergraduate Education" identify the imperative of changing teaching methods used in undergraduate education to produce graduates with lifelong learning skills. Among the five characteristics of teaching to support lifelong learning, one which was identified was the encouragement for, and the development of, reflective practice and critical self-awareness skills. Those authors argue that the implementation of teaching strategies that support the acquisition of the skills associated with reflective practice needs to be a priority in tertiary education.

Greenwood (2002, p.228) lists benefits of reflective practice:

- improve analytical thinking skills
- facilitate integration of theory and practice
- develop individual theories of a profession, to influence practice and generate professional knowledge
- advance theory at a conceptual level to lead to changes at professional, social and political levels
- heighten the visibility of the beneficial working of a profession
- enable the monitoring of increasing effectiveness over time
- explore and come to understand the nature and boundaries of their own role and that of other professionals
- come to an understanding of the conditions under which practitioners practise and, in particular, the barriers that limit practitioners' potential

- accept professional responsibility
- allow the generation of a knowledge base that is more comprehensive because it is directly tuned into what practitioners know about practice.

Both Simon (1976) and Schon (1988) identify a specific need for courses in “professional” education, at universities, to engender reflective qualities in their students. Schon (1988, p.327) admits that courses at universities often have their curricula based upon the diversity of professional perspectives and research interests of individual teachers. All too frequently the outcome of this situation is a course which may not mirror the real world professional context. Providing students with the ability to reflect on their learning, relate it to the real world context and have the ability to address issues is an essential skill of the professional. It is contended (Prosser, Trigwell, & Taylor, 1994) that learning involves an interactive process of knowledge construction through the incorporation of new knowledge and experience into prior knowledge, resulting in assimilation and accommodation, similarly referred to as conceptual development and conceptual change. Metacognitive strategies aid in linking the new information, or skills, with prior knowledge. Also of considerable importance to the learning process is reflection or metacognition which is best facilitated by social interactions and communication with others in a diversity of settings or contexts.

To better achieve the skills of reflective practice teachers must assume differing roles, that of facilitators or mentors. In that role, teachers will develop courses that create opportunities for students to engage in professional practice or activities and then to relate their experiences and underpinning knowledge to others and well as to instructors (Richardson, 1997). The outcomes of this change, in practice, will provide students with opportunities to assume an active role in the learning process, as they have the ability to initiate and direct their own learning. Greenwood (2002) lists benefits of journaling:

- the imposition of order on what are often chaotic experiences
- the bringing to light of connections and meanings that would otherwise remain hidden
- the clarification of ideas, perceptions and attitudes through writing them down
- an appreciation of one’s own role and influence in professional situations
- the exploration of culture, customs, history, values and beliefs, and their influence on self and others
- the encouragement of an analytic approach to practice.



Figure 1: Learning journals, reflection and learning outcomes

Birenbaum & Amdur (1999), in their report on implementing reflective learning journals, identify a number of issues. They establish that students who have the ability to reflect have their learning significantly enhanced by the learning experience associated with the development of journals. The diagram in Figure 1, drawn from their study, depicts how the use of the journals may support learning.

What Birenbaum & Amdur's (1999) report establishes is that it cannot be expected that all students have the skills necessary to gain best advantage from the learning experience of using reflective journals. They emphasise that, for journals to be truly effective, a structure or scaffolding needs to be built into the journals so that, more importantly, the journals become an integral part of the whole course experience; the journal must be seen by students as having relevance to the whole course. The on-line reflective journal developed at The University of Newcastle, NURAPID, facilitates what has been difficult before: the documentation and maintenance by students of a progressive journal over their whole program of study, so assembling evidence of achievement of core and discipline competencies. NURAPID also allows students to retrieve data at any stage and to produce reports in formats that may be tailored to meet specific requirements, e.g., assignments, curriculum vitae, etc. Imperative to the success of the journals is the support of students during the initial stages of their use; it cannot be assumed that students have the abilities or confidence to use the journals to their full potential.

The concept of linking the progress of learning to the program's core skills is seen as fundamental (National Committee of Inquiry into Higher Education Great Britain, 1977), especially in the context of a "professional" program where there are accrediting bodies with well-defined competency statements. The British Department for Education and Employment (1998) supported a number of projects which developed systems which support the students in monitoring, building and reflecting on their personal developments. Maddocks, Sher & Wilson (2000) describe the implementation of such a system, The "Recording Achievement Professional and Individual Development" (RAPID). This project identified that a system, if implemented with appropriate levels of student support, provided students with encouragement for developing skills in reflective practice. One aspect of this practice that was enhanced significantly was the ability of students to relate their learning and professional development to accredited professional competencies.

The project aim

RAPID, the precursor of the system documented in this paper, was developed in the Department of Civil and Building Engineering at Loughborough University, UK, in partnership with the UK Chartered Institute of Building (CIOB) (the professional institution accrediting construction managers and related construction professionals). The original two-year project was designed to encourage a lifelong perspective on personal and professional development. It was funded by the Department for Education and Employment (DfEE), and sought to promote a culture to enable and support students and graduates to monitor, build and reflect upon their own personal development within the construction discipline. It also aimed to introduce students to the professional development process at an early stage by encouraging them to build, maintain and develop a 'record of achievement' compatible with the CIOB's Professional Development Programme.

The drive for programs of this type came from employers and professional bodies, who have an increasing awareness of the importance of certain core professional skills, including communication, presentation and teamwork. Employers assume that university graduates possess technical knowledge but believe that other skills required to qualify for corporate membership of professional bodies are often not acquired for many years after graduation. The authors argue that if graduates can complete their studies having developed and documented these skills, they will be highly regarded by potential employers. Stakeholder interest in the attainment of professional skills is recognised as critical by the University of Newcastle. The University acknowledged this in the implementation of its "Core Skills" initiative in 2002 and as already mentioned will require that every graduate has received instruction and evaluation in the 13 Core Skills listed in Table 1. This NURAPID (Newcastle University RAPID) project is seen as a means of supporting the process of implementing the Core Skills and empowering students to take ownership of these skills.

The overall aim of the current project is to develop transferable models for the adaptation and implementation of an Internet based skills development and recording system. This will be achieved by:

- identifying the competencies and skill development needs for the core skills of The University of Newcastle and for four discrete disciplines (Building, Education, Nursing and Software Engineering) and arranging them in a competency profile;
- identifying the range of practices currently employed by professional bodies within these disciplines to support and advance professional development;
- identifying professional bodies that wish to extend professional development practices to undergraduate students through the use of the system;
- aligning student learning experiences and activities with identified skills for courses and programs;
- developing versions of the system that advance competencies and skills in line with the professional development needs of identified professional bodies and / or disciplines;
- implementing variants of the system on a dedicated file server;
- embedding discipline specific versions of the system in the student experience of four academic organisational units;
- developing tools and protocols contextualised to The University of Newcastle;
- conducting rigorous evaluation and dissemination activities; and
- providing a model that can be transferred to other professional bodies, industrial sectors, and Higher Education programs

In the NURAPID project each core skill has been broken into components, and then each component has been broken into four steps, ranging from lowest to highest level of competency. For example, Core Skill 1 states that graduates should “operate effectively with comprehensive and well-founded knowledge, skills and ethical standards appropriate to their fields of study”. The components and steps for the first two components are shown in Table 2. In NURAPID, definitions are provided for underlined terms.

1 OPERATE EFFECTIVELY WITH COMPREHENSIVE AND WELL-FOUNDED KNOWLEDGE, SKILLS AND ETHICAL STANDARDS APPROPRIATE TO THEIR FIELDS OF STUDY.

1.1 Managing and applying knowledge

- A** I can appreciate the need for and the value of gathering, managing and applying knowledge.
- B** I can collect information from a variety of sources¹ using techniques² I am familiar with. I can, with assistance, manage and manipulate³ this information, and I can present this information in a range of simple formats⁴.
- C** I can demonstrate confidence and familiarity with a range of information sources and information management techniques⁵. I am able to demonstrate a detailed knowledge of my chosen field of study including specialist areas of knowledge, and can incorporate, contextualise⁶, and apply new knowledge effectively in new situations.
- D** I can evaluate and select the most appropriate source of knowledge, and collection and management techniques. I can engage in constructive and critical review of new and emerging knowledge sources and knowledge management techniques. I can apply knowledge effectively to achieve a desired outcome in new and unfamiliar applications.

1.2 Discipline and current affairs

- A** I am aware¹ of the history, role and purpose² of my discipline and how general current affairs³ may impact on my industry and profession.
- B** I can demonstrate⁴ a knowledge of the history, role and purpose of my discipline and how general current affairs may impact on my industry and profession.
- C** I have a good knowledge and experience⁵ of the history, role and purpose of my discipline and how general current affairs may impact on my industry and profession.
- D** I am involved in developing⁶ and can advise others on the history, role and purpose of my discipline, and I am able to respond to general current affairs as they may impact on the industry and profession.

1.3 Reading and responding to written material

1.4 Skills of your Discipline

1.5 Ethical Standards of your Discipline

Table 2: Extract from Core Skill 1 “Operate effectively with comprehensive and well-founded knowledge, skills and ethical standards appropriate to their fields of study”

Figure 2 shows part of the Progress File screen which demonstrates the expanded core skills of the University of Newcastle. Students record their level of attainment of a particular skill by selecting a ‘radio’ button appropriate to the level they assess themselves to possess. In making this decision, students need to be able to provide evidence of their competence at that level. The screen for entering this data is shown as Figure 3. This approach has been found to be a pragmatic ‘acid test’ in deciding whether or not to claim competence at a particular level. Non-availability of evidence means that competence at a lower level must be claimed.

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<p>Operate effectively with comprehensive and well-founded knowledge, skills and ethical standards appropriate to their fields of study.</p> <ul style="list-style-type: none"> <input type="radio"/> Managing and applying knowledge <input type="radio"/> Discipline and current affairs <input type="radio"/> Reading and responding to written material <input type="radio"/> Skills of your Discipline <input type="radio"/> Ethical Standards of your Discipline 	<p>Acquire, organise and present information.</p> <ul style="list-style-type: none"> <input type="radio"/> Acquiring information <input type="radio"/> Organising information <input type="radio"/> Producing written material <input type="radio"/> Making presentations
<p>Reflect on and continue to develop their knowledge, skills and attitudes.</p> <ul style="list-style-type: none"> <input type="radio"/> Reflecting <input type="radio"/> Working towards identified targets <input type="radio"/> Managing personal development 	<p>Think logically, laterally, critically and creatively; analyse and synthesise.</p> <ul style="list-style-type: none"> <input type="radio"/> Critical reasoning <input type="radio"/> Conceptualising ideas <input type="radio"/> Applying creativity
<p>Act effectively in decision-making and problem-solving.</p> <ul style="list-style-type: none"> <input type="radio"/> Investigating problems <input type="radio"/> Solving problems 	<p>Carry out research activities.</p> <ul style="list-style-type: none"> <input type="radio"/> Utilising appropriate investigative and research methods

Figure 2: The RAPID progress file

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Operate effectively with comprehensive and well-founded knowledge, skills and ethical standards appropriate to their fields of study. Ethical Standards of your Discipline

Indicate your competence in this skill :- required

<input type="radio"/> A	I am aware ¹ of ethical standards appropriate to my discipline.
<input type="radio"/> B	I can demonstrate ² ability to conform to ethical standards of my discipline.
<input type="radio"/> C	I can demonstrate ability to discuss resolution of complex ethical issues ³ .
<input type="radio"/> D	I can demonstrate ability to perform appropriately in complex ethical situations.

What evidence do you have to support your claim of competence ? required	Where is this evidence located ?
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

Figure3: Evidence entry level

The NURAPID System

NURAPID draws on the original UK versions of the RAPID system. The design strategy for this tool incorporates mechanisms that allow for both the recording of achievement and the facilitation of skills development. The RAPID Progress File records tangible products (qualifications, certificates, awards, and so on) and develops skill acquisition and evidence of competence through the processes of planning, evaluation and reflection. This dual track approach is recognised as an essential feature of any recording achievement mechanism that claims to offer a means of encouraging and supporting a developmental process. RAPID comprises two discrete areas, PACE and SPEED.

PACE is the recording function of the RAPID Progress File. It enables registered users to input data including personal details, achievements (including qualifications), career development records, and evidence of achievements and competencies. SPEED is the function that enables registered users to develop skills through a process of skills audit, action planning, execution of skill development activity, evaluation of outcomes, reflection upon practice, and the documenting of appropriate evidence of competence. To assist this process a number of skills have been identified and categorised as either 'Core Skills' or 'Discipline Specific Skills'. The 'Core Skills' category refers to the skills listed in Table 1. 'Discipline Specific Skills' refer to those skills that emphasise competence within a particular discipline and workplace. An example of a discipline's skills is the Australian Nursing Council Inc. (ANCI) "Competency Standards for the Registered Nurse" (ANCI, 2000). An extract from these standards is shown in Table 3.

Domain: Professional and Ethical Practice

Competency Unit 1

Functions in accordance with legislation and common law affecting nursing practice.

Element 1.1

Demonstrates knowledge of legislation and common law pertinent to nursing practice.

Element 1.2

Fulfils the duty of care in the course of practice.

Element 1.3

Demonstrates knowledge of policies and procedural guidelines that have legal implications for practice.

Element 1.4

Identifies unsafe practice and responds appropriately to ensure a safe outcome.

Element 1.5

Recognises and acts upon breaches of law relating to practice.

Table 3: Extract from ANCI Competency Standards for the Registered Nurse

Students are encouraged to develop skills to appropriate levels and to generate sufficient verifiable evidence to support their claims of competence. This is displayed in table format to assist users to identify how the development of each skill might assist in generating evidence that can be used to meet the requirements of the University and professional bodies at a later date (Figure 3).

NURAPID has been developed in electronic format. It enables registered users to record, monitor and edit data stored on an interactive database. It is accessible to registered users with Internet access. Security of information stored is maintained through a system of limited access based on the use of a username and password. In the UK, the reflective process is designed to mirror that which graduates are expected to follow when engaged in the Chartered Institute of Building's (CIOB) Professional Development Programme. (Currently other UK professional institutions including The Royal Institution of Chartered Surveyors, The Institution of Civil Engineers, The Association of Building Engineers and the British Institute of Architectural Technologists are working to defining their own competency statements for incorporation within their own variants of RAPID).

Implementation within disciplines at Newcastle

The trial of the project will be within a limited number of disciplines which already have well defined professional competencies. The disciplines of Nursing and Building are two of these disciplines. The disciplines have organised the implementation of the system in different ways.

Nursing students will use the system to document their learning and their decisions for improving their understanding through a variety of activities. Throughout their program in clinical courses, students are asked to monitor and analyse their own learning. At the moment students maintain a clinical portfolio over the three years of the Bachelor of Nursing. To date the reflective journal has been paper-based and evaluation of student documentation has shown it to be disjointed as it documents each semester's development rather than overall development. The system will allow documentation of evidence of attaining the ANCI competencies which are a requirement for registration as a nurse in NSW. Nursing students will be introduced to the system in their first semester of the Bachelor of Nursing program and continue the use through the five other semesters.

First year **Building** students will use NURAPID to support the development of their skills. The Bachelor of Construction Management is delivered as problem-based learning and NURAPID will underpin students' *self-assessments* and *reflective journals*, practices which form integral elements of their formative and summative assessment. Furthermore, the skills statements incorporated within NURAPID will align with the competencies required of corporate members of the Australian Institute of Building. Students recording evidence of their skills development during their tertiary education will not only receive academic recognition for their efforts; they will be able to re-use such evidence to support their applications for membership of their professional institution. In this way, students will be encouraged and supported to use NURAPID throughout their academic career and beyond.

Measurement of effects of NURAPID

First and final year students of the disciplines have been surveyed in July 2002 to measure their understanding of the core skills and competencies and their attitudes towards the use of an electronic portfolio tool. Staff teaching in the disciplines have completed a similar survey. Results of the surveys will be available for inclusion in the presentation of this paper at the ASCILITE conference in December. A repetition of the survey to current first-year students when they are in their final year will allow measurements of any changes concerning knowledge and attitudes towards core and discipline skills. Comparison will also be possible between those students and students who are in their final year in 2002, never having used NURAPID.

Conclusions

NURAPID provides considerable benefits to students: they have an opportunity for structured reflective practice; they gain an opportunity to accumulate and store evidence of their acquisition of core and discipline skills; it gives them the ability to produce documents such as curriculum vitae and professional portfolios. The design of NURAPID means that students control access to their data; they can keep information confidential or they can allow access to mentors or others at various times during their studies. This access can be used for purposes of feedback, advising or assessment. The program is designed so that, after graduation, as alumni of the university, users could use NURAPID to continue development and maintenance of their portfolios throughout their professional careers.

The university also benefits from the use of NURAPID. It is a vehicle by which academics can engage with students to track the progress of students' skill development. It is a mechanism to encourage the concept of life-long learning. The program provides an opportunity for the university to link more closely with professional organisations by encouraging students to use the professional organisations' discipline skills and competencies throughout the students' university careers and beyond. Employers will benefit from gaining employees who are reflective practitioners with skills in providing and storing evidence of their skills, achievements and learning needs.

The project described in this paper is currently in implementation phase, the project team in developing the system for implementation of the trial have addressed a range of issues, not the least is the relative lack of understanding of the concept of core skills by students and lecturers alike. The NURAPID project will provide a viable system which will support students as they engage with core skills and their

development. The project team acknowledges that the process of contextualising the university core skills into the disciplines was a difficult but rewarding process as it provided an opportunity for the team members to reflect on what the programs were delivering as graduates. NURAPID is an innovation in using the Web as a learning tool and in developing interactivity on the Web. It is intended that the program will be available to all students of the University of Newcastle by 2004, and then to other Higher Education Institutions. NURAPID is intended to be available to students after graduation so that they can continue to use the program to assist them to reflect on their professional practice and to continually measure their own competency standards.

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