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DEVELOPING AN INSTRUCTIONAL DESIGN STRATEGY TO SUPPORT GENERIC SKILLS DEVELOPMENT

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Abstract

Higher education institutions are experiencing increasing pressure from government, industry, funding bodies and students, to place greater emphasis on developing generic skills that are currently delivered through the "hidden curriculum". This paper proposes an instructional strategy to help develop students' generic skills through a combination of face-to-face and on-line delivery. By investigating the nature of generic skills and contemporary methods of teaching and learning, an instructional framework is proposed to help prepare students for the workplace by promoting generic skill development as well as subject-specific knowledge.

Keywords

Higher education, generic skills, instructional strategies

Introduction

Over the past decade there has been a growing concern about the role of higher education institutions and how they are meeting the needs of employers. Increasingly, higher education institutions are being asked by industry, government and higher education funding bodies to produce graduates with versatile workplace skills, as well as subject-specific skills. This is causing a major reappraisal of higher education institutions purpose, learning outcomes and research activities (Australian National Training Authority, 1998; Bennett, Dunne, & Carre, 1999; Candy, Crebert, & O'Leary, 1994; Dearing, 1997; Mayer, 1992)

As higher education institutions struggle to implement the development of these workplace skills, they must firstly define what these skills represent. There are currently several synonyms for workplace skills including generic, key, core, life, competencies, employment, transferable, personal and others. These terms usually refer to "skills that are common to more than one work site, more than one occupation or more than one field of knowledge" (National Board of Employment Education and Training, 1996, p. 17). The Mayer Committee (1992) and the Finn Review (1991) identified the following as being required by graduates: working in teams, communicating clearly, personal and interpersonal skills, problem solving, understanding technology and using mathematical concepts efficiently. In this study, these skills will be referred to as generic skills.

However, varying definitions of what generic skills are and different requirements in different disciplines is complicating progress. Professional courses such as teaching, medicine and social work place a strong emphasis on collaboration and communication skills and are usually designed with practical work-experience components so that students learn "on the job" skills. Other courses have no work experience component or industry contact during their studies but may contain "stand-alone" modules designed to

teach these skills. Some courses have no work experience or generic skill development components (Bennett et al., 1999).

Employers are now explicitly demanding both generic skills and discipline knowledge from new graduates (ACNielsen Research Services, 2000). Higher education institutions must adopt new strategies to help promote the development of these skills to satisfy industry demand. Conventional approaches to teaching need to be reviewed in the light of new learning technologies and pedagogical viewpoints to help promote the development of generic skills "where pedagogical aspects need to be strengthened in line with technological changes to achieve a synergistic relationship with learning and technology" (Kearns, 2001, p.3).

Teaching and Learning Processes for Generic Skill Development

Previous research exploring the development of generic skills has demonstrated in many instances the need for learning settings that focus on *process* and student-centred activities rather than *subject content* (Biggs, 1999; Candy et al., 1994; Gibbs, 1992; Ramsden, 1992). The literature in this area suggests the need for meaningful learner activities. For example, Laurillard (1993) argues the need for learning environments that use a student centred process approach with dialogue, feedback, reflection, and task-oriented activities. *S*he further argues the need for learning activities to be situated in a contextual environment as in a "real-world activity" (Laurillard, 1993, p.29).

In line with constructivist learning theories that focus on learning process rather than content, more and more learning settings are beginning to emphasise the role of the learner in creating their own meaning in different learning situations by actively engaging with the content through accommodation and assimilation(Piaget, 1969) or through social interaction (Vygotsky, 1978). The development of generic skills as a component of curricular activity is seen to be promoted through learning environments that promote *deep learning*. Deep learning is an outcome frequently cited of learning settings that focus on processes as distinct from products (Ramsden, 1992). Driscoll (1994) argues that five conditions of learning are needed to provide an appropriate emphasis on the *process* of learning, as well as the *product* of learning. These are:

- Complex, rich learning environments that incorporate authentic activity;
- Social negotiation as an integral part of learning;
- Multiple juxtapositions of instructional content (i.e. examining the same material from multiple perspectives);
- Nurturance of reflexivity; and
- Emphasis on student-centred instruction (p. 45).

Many writers have attempted to conceptualise the attributes and nature of learning settings for higher education that promote deep learning through an emphasis on learning processes. Table 1 provides a summary and synthesis of the descriptions of a number of researchers and writers who have explored these conditions.

A Framework Describing Learning Approaches

A number of consistent elements appear to emerge from the literature which describes the conditions under which students can be encouraged to seek understanding and comprehension as distinct from surface level learning in instances where generic skills development is being sought. Three encompassing elements which appear to be consistent within the majority of researchers' descriptions include a need for settings: to encourage and promote self-regulated learning; to support and encourage reflection among learners; and to demonstrate degrees of authenticity and relevance of the content and learning processes.

Self-Regulated Learning

Learning strategies that promote self-regulated learning and a degree of intellectual independence are those where students are encouraged to engage with learning activities that are self-directed and

autonomous. Table 2 provides a number of descriptions of self-regulatory learning activities suggested by research into teaching and learning in higher education.

Author	Learning Strategies
Biggs (1999)	• a well structured knowledge base • an appropriate motivational context • learner activity • interaction with others • good teaching and assessment practices which incorporate learning objectives based on appropriate “verbs” • personal learner characteristics ie their approach to learning
Candy, Crebert and O'Leary (1994)	• self-directed and peer-assisted learning • experiential and real-world learning • problem based learning • reflective practice and critical self-awareness • self and peer assessment • on-line facilitation
Dart (1998)	• learner activity to promote student control of their own learning • vocational relevance • authentic assessment • good teaching and assessment practices which include openness to students and appropriate workload - “press for student understanding” • personal learner characteristics
Gibbs (1992)	• independent learning • problem based learning • reflection • learning by doing • developing learning skills
Ramsden (1992)	• independence and control • active engagement and student activity • problem solving • cooperative learning • feedback and reflection • good teaching practice. Includes interest, explanation of material, definition of clear goals, intellectual challenge and respect for students
Moses and Trigwell (1993)	• actively involving students through case studies, projects, discussions, workshops, presentations etc. • varying the degree of guidance and autonomy depending on the context • allowing students time for reflection and discussion • good teaching practice - variety of teaching strategies, high expectations, quality feedback and careful consideration of learning objectives
Tinkler, Lepani and Mitchell (1996)	• learner directed learning • learning to learn • contextualised learning • collaborative learning • on-line facilitation

Table 1: Contemporary learning strategies supporting deep approaches to learning

Self-directed learning can be described as the process whereby students have the ability to activate and sustain cognitions, behaviours, and affects, which are systematically oriented toward attainment of their learning goals and control of learning strategies and process while involved with learning tasks (Corno, 1994; Pressley, 1995; Schunk & Zimmerman, 1994). Self-directed learning activities are designed with a view of encouraging students to actively participate in their own learning. Priority is placed on students setting goals and objectives for their learning, planning the learning, engaging in learning activities, monitoring and regulating how the learning progresses and maintaining motivation to continue learning (Boekaerts, 1997; Jonassen, 1996). Other self-directed learner activities include the use of learner

contracts, negotiating learning needs, setting goals and priorities, considering learning methods, peer mentoring, applying performance criteria, finding resources needed for learning, and learners deciding when learning is complete (Biggs & Moore, 1993; Ford & Nichols, 1987; Schunk & Zimmerman, 1994).

Supporting Self-Regulation in Learning Activities for Higher Education
• Learners must be encouraged to actively take control of their own learning (Biggs, 1999; Dart, 1998)
• Independent learning, learn by doing, and the development of learning skills should be encouraged (Gibbs, 1992)
• Student independence and control, active engagement and student activity should be promoted (Ramsden, 1992)
• Learning activities should involve students through case studies, projects, discussions, workshops, presentations and other actions that promote autonomy (Moses & Trigwell, 1993)
• Should promote self-directed and peer-assisted learning (Candy et al., 1994)
• Promote learner directed learning and learning to learn (Tinkler et al., 1996)

Table 2: Learning Supporting Self-Regulation in Higher Education

Many employers and professional groups expect graduates to be adaptable, able to work independently and be willing to continue learning (ACNielsen Research Services, 1998, 2000). These are characteristics that are predicated on the graduate's ability to be a self-directed learner to support continuing professional development, both on and off the job. Developing learners' skills in self-directed learning has value both as an educational learning strategy for promoting deep and meaningful learning, and also as a required graduate attribute to encourage life long learning.

Reflection

A second element that is consistently included in descriptions of learning settings that promote knowledge construction and deep learning relates to the encouragement and support of reflection among learners. Reflection is a deliberate act of thinking about past or future events in which a perceived problem or activity is examined so that a reasoned response may be tested (Loughram, 1996). This enables learners to construct meaning from their experience by critically self-assessing their performance. Research consistently reveals the advantages and opportunities provided from learning settings that support students in developing their own perspectives and synthesis of the subject through reflective practice to promote the development of generic skills through deep and meaningful learning. Table 3 provides examples of research arguing the need for reflection in effective higher education learning environments.

Supporting Self-Regulation in Learning Activities for Higher Education
• Deep approaches to learning are achieved by reflecting and theorising (Biggs, 1999)
• Feedback and reflection are essential for deep learning (Gibbs, 1992; Ramsden, 1992)
• Giving students time for reflection and discussion is essential for meaningful learning (Moses & Trigwell, 1993)
• Reflective practice, critical self-awareness and self/peer assessment are essential for developing deep approaches to learning (Candy et al., 1994)

Table 3: Learning supporting reflection in higher education

Reflection is often defined as a process that enables connections between the various elements of an experience. Dewey (1933) refers to reflection on experience as a learning loop that 'runs back and forth' between the experience and the relationships being inferred. The concept of the learning loop has gained popularity through the work of Kolb (1984) and his four stage experiential learning model in which learners move through a series of phases involving experience, reflection, generalising/theorising and planning. Kolb (1984) argues the need for experiential learners to:

- Involve themselves in new experiences without bias

- Reflect upon experiences from multiple perspectives
- Integrate their observations into logically sound theories, and
- Use these theories in decision-making and problem solving.

Reflective practice is being promoted by new accreditation processes for graduate engineers in Australia (Jolley, Radcliffe, & McLeod-Palma, 2000) and has the potential to deliver on many of the recommendations about graduate attributes now recommended by Australian Universities (McLoughlin & Luca, 2000). Other related learner activities used to help promote reflection include revision, reconstruction and rethinking of ideas and problem solving sequences, exchanging ideas, commenting on others' work, engaging in critical self-assessment self and peer assessment activities, and using reflective journals (Boud, Keogh, & Walker, 1985; Cox, 1994; Seale & Cann, 2000).

Authenticity

A third element that frequently emerges in descriptions of learning settings that support knowledge construction and deep learning in higher education relates to the degree of authenticity experienced by learners in the learning setting. Authentic activities provide students with opportunities to develop knowledge and skills needed for specific contexts, jobs and roles. These learning environments should preserve the full context of the situation and allow for the natural complexity of the real world (Barab, Squire, & Dueber, 2000; Brown, Collins, & Duguid, 1989; Cognition and Technology Group at Vanderbilt, 1993; Resnick, 1987; Winn, 1993). These views of learning are reflected in the following: "Learning occurs naturally as a consequence of the learner recognizing knowledge's practical utility as well as the need to use it in an attempt to interpret, analyse, and solve real-world problems"(Land & Hannafin, 2000, p. 13).

Learning activities based on an authentic context reflect the way in which the information being learnt is actually used in the workplace, and provides students with tasks or problems that have real world relevance. Table 4 shows the way in which writers describe settings that support knowledge construction by including elements in their design that reflect a need for authenticity.

Immersing students in real world contexts can promote the development of students' workplace readiness skills. The course students choose at higher education institutions is essentially the vehicle that will enable them to gain employment, so should reflect the real world with employers expectations and necessary professional attributes. Traditional pedagogy often only provides students with isolated concepts delivered through didactic teaching practices relying on direct delivery methods such as lectures to impart content knowledge, which is generally isolated from reality. Authentic environments aim for developing "real-world" scenarios that students can readily relate to and see relevance in (Brown et al., 1989; Jonassen, 1991; Petraglia, 1998; Resnick, 1987). Learning activities used to promote authentic context include problem-based learning, real world activities, project work, teamwork, simulation, role-play, work experience, practical work and industry visits.

Supporting Authenticity in Learning Activities for Higher Education
• Provide an interactive authentic environment with an appropriate motivational context (Biggs, 1999)
• Promote learning environments with vocational relevance and authentic assessment (Dart, 1998)
• Encourage authentic problem-based learning (Gibbs, 1992; Ramsden, 1992)
• Encourage using conceptualised learning and collaborative learning (Tinkler et al., 1996)
• Promote experiential, real world and problem based learning (Candy et al., 1994)

Table 4: Learning activities supporting authenticity

Instructional design strategies supporting generic skills development

Designing and developing learning settings that incorporate these three principles is facilitated by the use of the implementation strategy described by Oliver and Herrington (2001) which advocates a design methodology centred on developing student-learning activities as the main focus of the course design. This model articulates the need for the deliberate and independent design of tasks, resources and supports in the design process. When this design model is applied to the task of developing learning settings for higher education that promote self-regulation, reflection and authenticity, a number of complementary design features emerge (Figure 1).

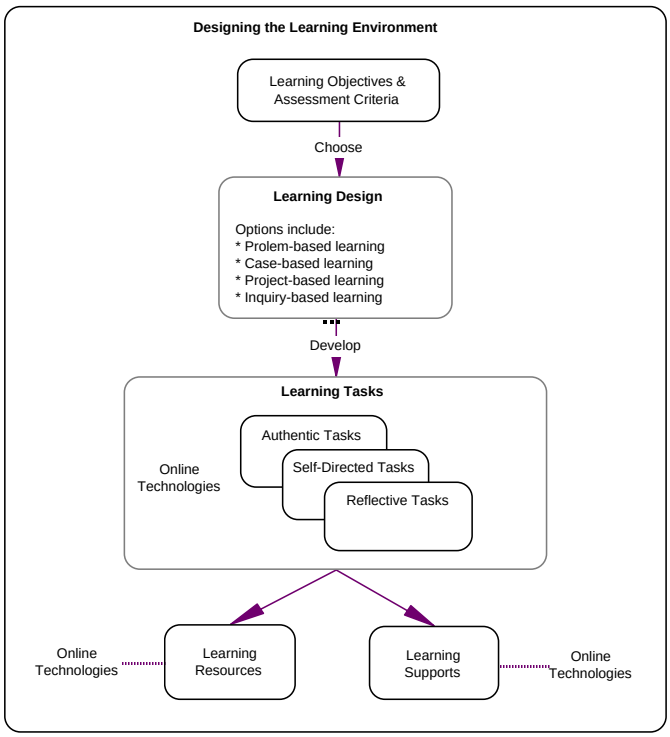

Figure 1: Course implementation framework

Application to Course Design

In order to explore the utility and efficacy of these ideas, the design methodology described above was applied to the development of a course in a university setting. The chosen course was IMM 3228, Project Management Methodologies, a course in a multimedia degree where generic skills development was a stated aim of the course objectives. The design process sought to provide a range of learning activities based on the principles of authenticity, self-regulation and reflection using online technology to support the face-to-face delivery. These activities were carefully chosen to achieve the desired learning outcomes and help learners actively engage with learning materials within an authentic setting that required collaboration, self-direction and reflection, with a view of promoting knowledge construction (Table 5). It was intended that learners be required to make their own decisions about which activities they would perform, share ideas and then actively reflect on the results.

Authenticity was promoted through project work with real clients that required a web site to enhance productivity. Student teams were required to liaise with clients to develop a project proposal, design specification and then develop a web site. As in real project scenarios these teams were required to cost, schedule and track these projects, reporting any discrepancies. It was also intended that students would develop documentation that had direct relevance in the industry for quality assurance and costing web sites to aid in future multimedia development work. The final product and documentation was to be hosted on a university server for students to use as an electronic CV to enhance their employment opportunities.

Self-regulation was promoted by allowing students to make free and open choices about a range of different learning tasks, including project topic, team members, their team roles and responsibilities. This would enable students to make decisions about what skills they wanted to focus on and develop, and be negotiated at the beginning of the semester through contracts with peers, clients and tutor. Students would also be encouraged to continually reflect on their progress through a range of different activities. Online reflective journals would monitor self and peer assessment by having all students reflect on their performance. This would be performed at two levels: within their own team (intra-team), and for other teams' work (inter-team). These assessments would then require students to allocate marks and justify their viewpoints with constructive feedback. Discussion and reflection would also be encouraged through online bulletin boards that would allow students to review ideas and criticisms with a wider audience.

	Learning Tasks	**Learning Supports**	**Learning Resources**
Authentic	Tasks that are contextual, meaningful, ill-defined, involving collaborative effort and are perceived as having real world relevance outside the academic setting eg: • Developing a multimedia product based on solving the needs of a "real" client. Final product hosted on university server as a CV item	Support for students to build expertise and knowledge through authentic activities eg: • Variety of project briefs, presentations and information helping to describe client needs • Online summary of student profiles, skills and interests to assist in team formation • Tutor advice on time needed for each task and responsibilities	A variety of authentic resources to provide a range of perspectives eg: • Online samples of past student projects • Multiple employer perspective's presented through streaming video • Metrics used in industry for estimating time • Online quality assurance procedures and templates • Server space for hosting projects and storing documentation
Self-directed	Tasks that allow students to make their own decisions for range of different tasks eg: • Negotiating contracts for project topic, team members, role, duties and time • Creating solutions to variety of tasks - posted to an online area for assessment and feedback	Academic support, library support, counselling and online support to help task delivery eg • Online application summarises student skills and interests for team matching • Online tutorials with a variety of graded exercises. Students decided which they needed to complete • Modelling by tutors in first 3 weeks show how to post solutions and assess others work	A variety of self-directed learning resources to help students develop skills eg • Weekly online "Briefs" outlining items to complete. Students free to choose most relevant for their needs • Online resources covering each weekly topic – includes slides, templates, videos and URL's • Book and readers • A range of job selection criteria and online job advertisement for multimedia developers
Reflective	Tasks that encourage reflection and provide feedback eg • Weekly journal entries for self and peer assessment (Intra) • Weekly assessment of three other teams' solutions (Inter) • Reflective reports	Feedback support mechanisms that are responsive and sensitive to student needs eg: • Tutor led peer assessment sessions • Online communication, feedback and discussion with tutor and peers through bulletin boards	Resources that help students monitor their own and peers' efforts eg online applications for: • Assessing self and peers • Comparing actual against estimated time • Comparing actual against promised deliverable's

Table 5: Designing the online learning environment

These learning activities were promoted through a combination of project activities, task-based learning strategies and face-to-face lectures in an attempt to support knowledge construction. The learning environment would attempt to promote "scaffolded inquiry", rather than unconstrained discovery through a combination of active exploration and listening to a lecture (Cognition and Technology Group at

Vanderbilt, 1992, 1996, 1997; Schwartz & Bransford, 1998). Figure 2 shows the overall learning design of the Project Management learning environment based on these principles.

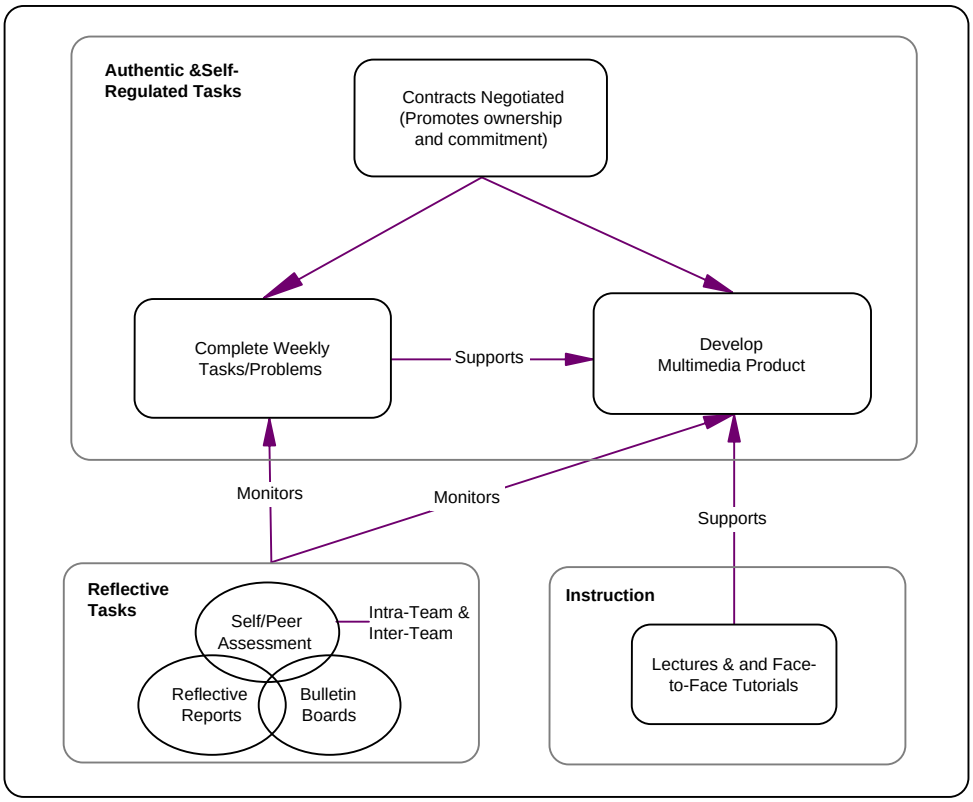

Figure 2: Guiding design principles in Project Management Online course

The Online Learning Environment

The online learning environment was developed using learning activities that promoted authenticity, reflection and self-regulation (http://www.scam.ecu.edu.au/joepm). An office metaphor (Figure 3) was used that contained icons such as:

- In-tray for weekly tasks;
- Contract to help gain commitment from each team member (completed at the beginning of semester);
- Journal for entering weekly self and peer assessments;
- Filing cabinet with support materials;
- Video player with streaming video showing local industry representatives;
- Conference centre for students to post weekly solutions to problems, and assess the work of other teams; and
- A team administration area for team member profiles, email and web access information for the team's web site.

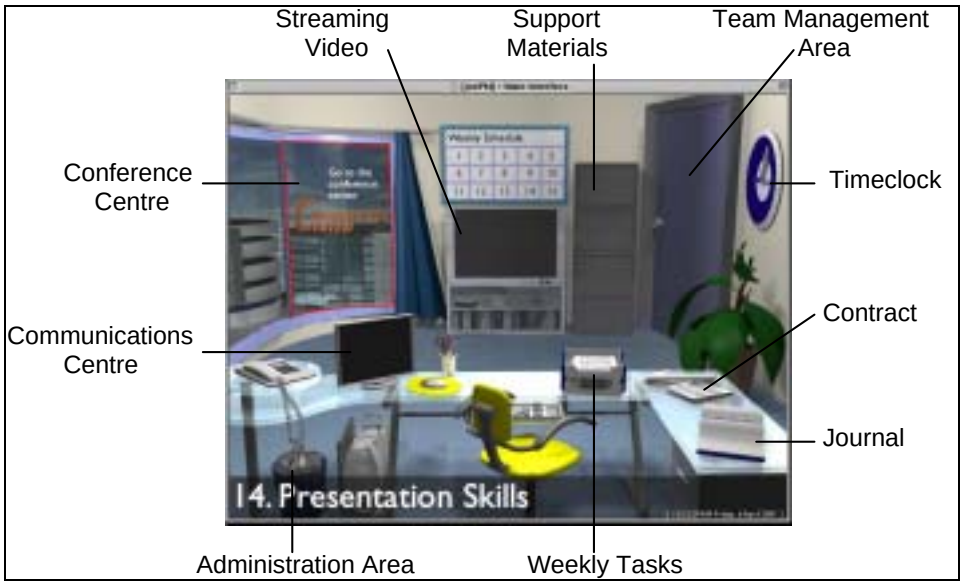

Figure 3: Main interface

The online learning site was supported with server that enabled students to create electronic portfolios of their work (http://www.scam.ecu.edu.au/projects). These are kept online for a number of years so that students can use them as part of their CV's when applying for jobs.

Summary

An instructional design framework has been developed to promote the development of students' generic skills, as well as deep and meaningful approaches to learning. The instructional framework proposes that three key learning principles for designing effective learning environments – authenticity, self-regulation and reflection. These principles were used in the design of learning activities that were integrated into a course that was delivered in face-to-face mode, and supported with an online environment, designed using these principles. A comprehensive evaluation study is currently being carried out to evaluate the success of the learning environment, and outcomes will be reported in subsequent papers.

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