

A re-examination of graphic design pedagogy, and its application at the University of Wollongong: Towards a PhD in design education

Biography:

Grant Ellmers currently lectures in graphic design and digital media in the Faculty of Creative Arts at the University of Wollongong. Between 1999-2002 Grant lectured in graphic design at the University of Canberra where he was primarily responsible for developing the new media course component.

Grant obtained his Masters of Visual Arts from the Australia National University in 2000 where he investigated issues of national identity contrasting the Australian indigenous and non-indigenous perspective within a post-colonial framework.

Grant's current research focus is design pedagogy and is currently enrolled in a Masters by Research in the Faculty of Education at the University of Wollongong.

BACKGROUND

STUDIO-BASED LEARNING

Studio-based learning has its origins in architectural design education and has been informed by a number of historic educational approaches. These include the Quincy system dating from the late 1800's, John Dewey's work with the development of the Laboratory School in Chicago during the late 1800's, and the platoon system developed by William Wirt at the Horace Mann High School in Indiana during the early 1900's (Lackey 1999).

Lackey (1999) outlines the fundamental features of studio-based teaching in the architecture studio; setting the design problem, periodic lectures, critique of student work (4 distinct types - desk critique, pin up, interim/midterm critique, and final critique), and assessment by design jury.

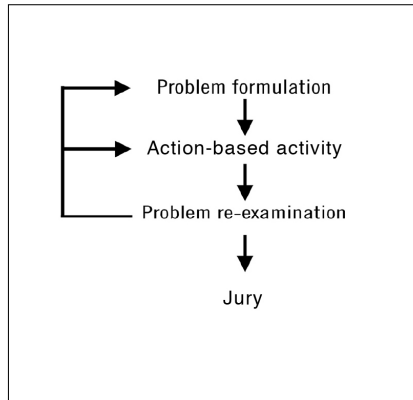


Figure 1: The design studio teaching cycle (Kvan 2001)

The studio-based learning process is outlined by Kvan (2001) in figure 1. Firstly there is the formulation of the problem, then exploration of solutions through action-based activity, followed by problem re-examination, and finally to jury for examination. The first three steps are recycled until a satisfactory solution is realised before proceeding to examination. The relationship in this setting between teacher and student, is framed by the master-apprentice approach (Schön 1987).

Schön notes that the studio-based learning framework is not infallible however and identifies 2 key issues to consider; stance and behaviour (Schön 1987). Stance is the situation where the design teacher or 'master' withholds their knowledge due to fear the "student may misunderstand, misuse, or misappropriate" (Schön 1987 p. 119) that knowledge and expertise. Behaviour represents the interaction between the student and design teacher or master, where a successful learning experience is reliant on the development of an effective relationship.

Studio-based learning in higher education has come under further criticism. Anthony (1991) documents considerable concerns regarding the studio-based learning model, particularly the jury process. The data from her study of the jury process indicated that the vast majority of students felt the design studio and jury approach needed improvement. Anthony found little or no formal attention given in the studio to design production issues, there appeared to be little formalised support for research technique development, and faculty often failed to provide constructive criticism during the jury assessment process. Anthony suggests that studio-based learning would benefit from a major overhaul and that faculty could look to the pedagogical approaches of medicine and law.

Henderson (2004) summarising the 2003 Studio Culture conference, highlights it is increasingly difficult for education institutions to sustain a vibrant studio culture in the traditional sense and traditional studio-based learning appears in decline. Contributing factors include, pressures on staff time, diminishing resources, increasing student to staff ratios, changing student work and study patterns, health and safety issues, and increasing reliance on computer aided design.

Suggestions arising from the conference include introducing formalised collaborative learning, redefining the design critique and jury assessment process to establish a greater positive learning experience.

THE REFLECTIVE PRACTITIONER

The concept of the 'reflective practitioner' outlined by Schön (1983; 1987) provides a framework for understanding and plotting the process of studio design practice and activity. Schön's theory is based on a constructivist view of human perception and thought processes; the designer constructs their view of the world based on their experiences (Valkenburg and Dorst 1998).

Schön (1983; Schön 1987) highlights reflection as a critical element of professional design activity and articulates two types of reflection; reflection-in-action and reflection-on-action. Reflection-in-action takes place when the design professional is 'surprised' by, or experiences a unique situation during the development of the design solution. Reflection-on-action involves the review of actions from the recent past. Eraut interprets Schön's reflection-on-action as the "process of making sense of an action after it has occurred and possibly learning something from the experience which extends one's knowledge base" (Eraut 1994 p. 146).

Schön (1987) maintains that reflection is intimately bound up with action. He rejects the theory of technical rationality that distinguishes professionals by the extent of their 'book knowledge' (Adams *et al.* 2003). Design practice is action-oriented and relies on an implicit knowledge that resists definition within the prevalent methodological paradigm of technical rationality (Schön 1983; Schön 1987; Valkenburg and Dorst 1998). Through knowing-in-action the designer employs both reflection-in-action and reflection-on-action strategies (Schön 1987).

Modern history of the reflection ideology is commonly credited to the educationalist and philosopher John Dewey (Schön 1987; Schon 1992; Waks 1999; Griffiths 2000; Waks 2001; Rolfe 2002). Dewey (1933) states that reflection is framed by scientific thinking and learned by doing.

Both theories of reflection outlined by Dewey and Schön can be defined as learning-by-doing, however, the key difference here is that Dewey looks to remove the reflection process from the practical problem and engage in scientific thinking, where as Schön maintains reflection occurs within professional activity, not removed from it (Waks 1999).

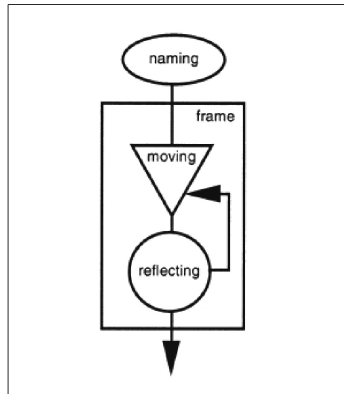


Figure 2: Schön's reflective practice theory (Valkenburg and Dorst 1998)

Valkenburg and Dorst (1998) applied Schön's reflective practice theory to outline the process of design practice. They broke the design process down into four stages (see figure 2). *Naming* - the problem is articulated; *framing* - the context of the problem; *moving* - the actual design activity, and *reflecting* - the designer assesses the design development within the context of the frame.

Based on Schön's reflection strategies, Quayle and Paterson (1989) outlined techniques to encourage reflection in studio-based design education. They defined these techniques as 'informed reflection' and incorporated strategies for design learning that bridge one student project to another, include reflection during and after the design process, and require "conscious reconsideration of a thought, idea or experience with expressed objectives" (Quayle and Paterson 1989, p. 30).

Adams *et al.* (2003) employed Schön's reflective practitioner framework to analyse the design activity of engineering design students. From their empirical data the researchers were able to map the design activity of the students and concluded "problem setting and engaging in a reflective conversation across problem setting and problem solving activities are important features of effective design practice" (Adams *et al.* 2003, p. 292).

Eraut (1994) noted inconsistencies with Schön's theory. While Schön distinguished between reflection-in-action and reflection-on-action, Eraut maintained this is not sustained through Schön's writings. This is also reiterated in the work of Munby and Russell (1989). Confusion arises when trying to apply Schön's two modes of reflection and Eraut suggests that replacing the term reflection with metacognition would help provide a clearer distinction.

PROBLEM-BASED LEARNING

Problem-based learning emerged from medical schools during the 1970s "to address learning in preclinical medicine and to redress limitations in traditional learning and instruction" (Koschmann *et al.* 1994 p. 240).

Rhem (1998) defines problem-based learning as an instructional educational methodology in which students engage with contextualised problems and look to discover meaningful solutions. White (1996) states an essential aspect of problem-based learning is the use of ‘real-world’ problems to frame the approach to learning. Students work in small groups to discover solutions to the problem. It is through this discovery that the students identify what they know and importantly what they don’t know, establishing a framework in which to approach the problem (Duch 1997; Major and Palmer 2001).

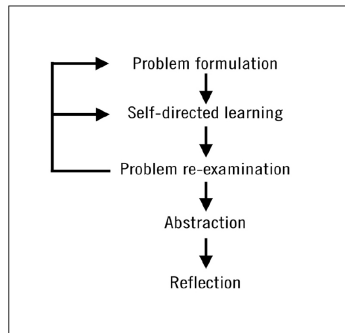


Figure 3: Five steps in problem-based learning (Koschmann et al. 1994)

Koschmann *et al* (1994) outline five fundamental steps in the problem-based learning strategy (see figure 3). The student groups engage in the formulation of the problem, then identify what they need to learn to solve the problem (self-directed learning), and then re-examine the problem to test whether they have discovered the appropriate facts, skills or concepts to propose a solution. If the problem is not solved, the students cycle back through the first three stages until a satisfactory solution is developed (Kvan 2001). The students at this point proceed to the abstraction and reflection steps. The abstraction stage involves the students articulating what they have learned and the case is contextualised with other known cases (Koschmann *et al.* 1994). In the reflecting stage, the group discusses their approach, then reflects and critiques their learning process seeking to identify areas for future improvement (Koschmann *et al.* 1994).

Key advantages of the problem-based learning approach in relation to traditional learning frameworks have been highlighted by Greening (1998), Rhem (1998), Watson (2002), and Pederson (2003). These advantages include increased information retention by students, development of integrated knowledge (rather than discipline specific knowledge), development of teamwork and communication skills, higher learning motivation levels, and development of self-directed and life-long learning skills. White (1996) and Greening (1998) highlight the need for problem-based learning specific assessment methods observing that problem-based learning oriented assessment tasks require a different approach to traditional assessment procedures.

Concerns inherent in the transition from traditional teaching approaches to problem-based learning have also been identified. Greening (1998), and Morris and Katz (2004) document a resistance by faculty and student body to change, and issues in transitioning from a traditional individualistic and competitive learning context to a group-based learning environment. Greening (1998) suggests a specific student skill set is required to engage with the problem-based learning approach, supported by a change in the manner resources are made available. Albanese and Mitchell (1993) and Greening (1998) suggest a scaffolded learning approach to reduce the impact associated with dramatic change. Drinan (1991) notes a level of maturity required to fully engage with the demands of problem-based learning that might not suit all levels of UG study. This is reinforced by the difficulties documented by Morris and Katz (2004) implementing problem-based learning in a first year industrial design undergraduate studio. While Albanese and Mitchell (1993) caution against large class sizes due to the small group work nature of problem-based learning.

Examining problem-based learning and studio-based learning, Kvan (2001) observes parallels between the two. He notes that problem-based learning appears to emerge from the principals of studio-based learning, however makes the important point that in light of problem-based learning practices, “important opportunities for learning are omitted in the studio setting” (Kvan 2001 p. 95). Kvan points to problem-based learning’s focus on project process compared to studio-based learning’s focus on the design project. It is this failure of studio-based learning to include a formalisation of the design process that concerns Kvan.

PROPOSED RESEARCH STRUCTURE

THEORETICAL FRAMEWORK

This study will be situated within a constructivist learning framework. “Constructivism is a philosophical view on how we come to understand or know” (Savery and Duffy 1996 p. 135). This theory “emphasizes the importance of meaningful, authentic activities, that help the learner to construct understandings and develop skills relevant to solving problems” (Wilson 1996 p. 3).

The basic assumptions of constructivism include, knowledge as an active process situated in lived worlds, individuals constructing their own knowledge, meaningful learning that is useful and builds on what the learner already knows, and locates the teacher’s role as coach and mediator (Maier 2000). Key aspects of constructivist theory pertinent to this study include; learning through experience and authentic learning tasks, situating students in real world learning environments, case-based learning, problem solving, and reflection (Maier 2000). These principals are inherent within the learning frameworks of studio-based learning, problem-based learning and the Schön’s reflective practitioner.

RESEARCH QUESTIONS

The proposed research seeks primarily to answer the question: how does a reflection-on-action strategy impact on student learning in a graphic design higher education environment?

Secondary questions include,

- What is a reflection-on-action strategy and how can it be implemented in a university graphic design context?
- What is problem-based learning and how can it inform studio-based learning?
- How can Schön's reflection-on-action strategy be incorporated into a studio-based learning environment?
- How does a reflection-on-action strategy affect student learning outcomes?

RESEARCH DESIGN

This study proposes to employ a qualitative explanatory case study (Yin 2003) approach incorporating surveys and individual case studies. The data will be analysed using qualitative methods.

Qualitative research design is commonly employed by education researchers (Mertens 2005). "Qualitative researchers study things in their natural settings, attempting to make sense of, or to interpret, phenomena in terms of the meanings people bring to them" (Mertens 2005 p. 229). It will be important to study how the students respond to inclusion of the introduced strategy in the environment in which they will be working due to the nature of the design studio-based learning context. A fundamental premise of studio-based learning is the engagement between students and teaching staff in the studio environment (Schön 1987).

The survey will consist of qualitative pre and post-surveys to document the participants understanding of the design process throughout the study period. Ten individual case studies will be incorporated to provide more detailed data with suitable participants identified from the pre-survey. Multiple data sets will be employed in the form of surveys, semi-structured interviews, participant-observation, and participant artefacts. A journal maintained by the researcher documenting observations and reflections throughout the study will also be included.

A pilot study will be employed to test the proposed methods and observe trial data. This will provide an important opportunity to refine the proposed data collection methods.

Qualitative analytic strategies will be employed to analyse the data. This will include, coding, memoing, pattern identification, and drawing conclusions (Miles and Huberman 1994). Multiple data sets will be employed to establish a triangulation strategy to address issues of data credibility (Mertens 2005).

- It will be beneficial to employ computing software to help store, retrieve and aid analysis of the data. I am proposing to use QSR NVivo due to the programs linking, shaping and modelling capabilities and its ability to manage multimedia data.

BIBLIOGRAPHY

Adams, R. S., J. Turns and C. J. Atman (2003). 'Educating effective engineering designers: the role of reflective practice.' *Design Studies* 24(3): 275.

Albanese, M. A. and S. Mitchell (1993). 'Problem-based learning: a review of literature on its outcomes and implementation issues.' *Academic Medicine* 68(1): 52-81.

Anthony, K. A. (1991). *Design juries on trial: The renaissance of the design studio*. Van Nostrand Reinhold, New York.

Dewey, J. (1933). *How We Think: A Restatement of the Relation of Reflective Thinking to the Educational Process*. Heath, Boston.

Drinan, J. (1991). 'The Limits of Problem-based Learning.' in Boud, D. J. and Feletti, G. (eds.), *The Limits of Problem-based Learning*. Koran Page, London.

Duch, B. (1997). *Problems: A Key Factor in PBL* [online]. Available: <http://www.udel.edu/pbl/cte/spr96-phys.html> [Accessed 23rd March 2005]

Eraut, M. (1994). *Developing Professional Knowledge and Competence*. The Falmer Press, London.

Greening, T. (1998). 'Scaffolding for success in PBL.' *Medical Education Online*, vol. (3), Available: <http://www.med-ed-online.org> [Accessed 01/04/05]

Griffiths, V. (2000). 'The reflective dimension in teacher education.' *International Journal of Educational Research* 33(5): 539.

Henderson, G. (2004). *Studio Culture: Who Needs It? Summary of Conference* Available: <http://www.cebe.ltsn.ac.uk/news/events/concrete/summary.html> [Accessed 13th April]

Koschmann, T. D., A. C. Myers, P. J. Feltovich and H. S. Barrows (1994). 'Using technology to assist in realizing effective learning and instruction: a principled approach to the use of computers in collaborative learning.' *The Journal of the Learning Sciences* 3(3): 227-264.

Kvan, T. (2001). *The Problem in Studio Teaching - Revisiting the Pedagogy of Studio Teaching*. 1st ACAE Conference on Architectural Education. Milton, T. Centre for Advanced Studies in Architecture, National University of Singapore: 95-105.

Lackey, J. A. (1999). *A History of the Studio-based Learning Model* Available: <http://schoolstudio.engr.wisc.edu/studiobasedlearning.html> [Accessed 12th April]

Maier, D. (2000). *Instructional Technology Global Resource Network* Available: www.ittheory.com/construct.htm [Accessed 14th June 2005]

Major, C. H. and B. Palmer (2001). 'Assessing the Effectiveness of Problem-Based Learning in Higher Education: Lessons from the Literature.' *Academic Exchange Quarterly* 5(1).

Mertens, D. M. (2005). *Research methods in Education and Psychology: Integrating diversity with quantitative and qualitative approaches*. 2nd Edition. SAGE Publications, California, USA.

Morris, R. and T. Katz (2004). *Evaluating Problem Based Learning in the Teaching of Design in Post Modular Education*. International Engineering and Product Design Education Conference, Delft, The Netherlands.

Munby, H. and T. Russell (1989). 'Educationing the reflective teacher: A essay review of two books by Donald Schon.' *Journal Of Curriculum Studies* 21(7): 71-80.

Pederson, S. (2003). 'Motivational Orientation in a Problem-Based Learning Environment.' *Jl. of Interactive Learning Research* 14(1): 51-77.

Quayle, M. and D. Paterson (1989). 'Techniques for encouraging reflection in design.' *Journal of Architectural Education* 42(2): 30-42.

Rhem, J. (1998). 'Problem-based Learning: An Introduction.' *The National Teaching and Learning Forum* 8(1).

Rolfe, G. (2002). 'Reflective practice: where now?' *Nurse Education in Practice* 2(1): 21.

Savery, J. R. and T. M. Duffy (1996). 'Problem-based learning: An instructional model and its constructivist framework.' in Wilson, B. G. (eds.), *Problem-based learning: An instructional model and its constructivist framework*. Educational Technology Publications, Englewood Cliffs, N.J.

Schön, D. (1983). *The Reflective Practitioner: How professionals think in action*. Basic books, New York.

Schön, D. A. (1987). *Educating the Reflective Practitioner*. Jossey-Bass Inc, San Francisco.

Schon, D. (1992). 'The Theory of Inquiry: Dewey's Legacy to Education.' *Curriculum Inquiry* 22(2): 119-139.

Valkenburg, R. and K. Dorst (1998). 'The reflective practice of design teams.' *Design Studies* 19(3): 249.

Waks, L. J. (1999). 'Reflective practice in the design studio and teacher education.' *Journal Of Curriculum Studies* 31(3): 303-316.

Waks, L. J. (2001). 'Donald Schon's philosophy of design and design education.' *International Journal Of Technology And Design Education* 11(1): 37-51.

Watson, G. (2002). *Using Technology to Promote Success in PBL Courses* Available: <http://udel.edu/pbl/articles.html> [Accessed 12th April 2005]

White, H. B. (1996). *Dan Tries Problem-based Learning: A Case Study*. New Forums Press and the Professional and Organizational Network in Higher Education., Stillwater, OK.

Wilson, B. G. (1996). 'What is a constructivist learning environment?' in Wilson, B. G. e. (eds.), *What is a constructivist learning environment?* Educational Technology Publications, Englewood Cliffs, N.J.

Yin, R. K. (2003). *Case Study Research: Design and Methods Third Edition*. Sage Publications, Thousand Oaks, California.