

## Teaching for e-Learning in the Knowledge Society: Promoting Conceptual Change in Academics' Approaches to Teaching

R. Webster, and F. Sudweeks\*

School of Information Technology, Murdoch University, Murdoch WA 6150, Australia

This paper suggests that recent changes in higher education, the demands of the knowledge society and an increased need for students to become autonomous, reflective e-learners increases the need for academics to understand the learning process. In order to understand e-learning, teachers need to understand learning as e-learning is embedded in learning. Without an understanding of what learning encompasses, it can be difficult for many academics to develop into good teachers and to promote good e-learning practice. University teachers need to develop a theory of learning and teaching to apply to e-learning scenarios. This paper outlines a program for promoting conceptual change in academics' approaches to teaching via an understanding of learning and e-learning. A strategy is developed, initially based on IT units, to help extend the approach to other areas. A dissemination and evaluation strategy is also outlined.

**Keywords** knowledge society, e-learning, theory of learning

### 1. Introduction

Recent changes in higher education, the demands of the knowledge society and the increased need for students to become autonomous, reflective e-learners has increased the need for academics to understand the learning process. The purpose of teaching is to enable learning [1] and in order to enable learning we must understand what learning is, how it works and just how diverse it can be. E-learning is embedded in learning so without an understanding of what learning encompasses, it can be difficult for many academics to develop into good teachers and to promote good e-learning practice. This understanding of learning is best accessed through an individual's understanding of his/her own learning followed by an appreciation of the large variations in approaches to learning existing in and adopted by any given body of students. This paper suggests a strategy and methodology for enabling conceptual change in academics' approaches to teaching for learning in the knowledge society by engaging with these issues.

The mechanism used to do this is provided by the concept of student learning profiles. Each individual has a learning profile, of which the core constituents are cognitive style, learning style and personality type. These three profile components interact in ways which produce individual and personalised approaches to learning. Facilitating an understanding of the range of possible learner profiles via accessing and reflecting on their own profile can help enable academics to become more effective teachers.

### 2. Purpose and rationale of the research

The overall purpose of the proposed research is to provide a strategy for developing a network of disciplinary leaders for excellence in learning and teaching in information technology. This will be achieved by enabling conceptual changes in the approaches of academics to their teaching by using an understanding of personal learning to enhance the teaching skills of university teachers.

Working from a subject dependent (Information Technology) and departmental base, the intention is to provide a framework which can be extended in two ways. The first is from the departmental level through the faculty level to the institutional level. The second is by providing a subject independent methodology that can be adapted to each area.

---

\* Corresponding authors: F. Sudweeks, f.sudweeks@murdoch.edu.au, Phone: +61-8-9360-2364, and R. Webster, r.webster@murdoch.edu.au

A phrase from Paul Ramsden [1] emphasises that: "The aim of teaching is simple: it is to make student learning possible." (p.5) While it might be quoted often and proclaimed to be a simple aim, it is not necessarily understood (and especially applied) by university academics in their teaching. Laurillard [2] even suggests that: "[I]t is difficult to find an academic with a theory of learning. Or even one who thinks it is his job to have one." (p.113). An inference from this is that university teachers need to develop a theory of learning and teaching. Most academics may well have a 'philosophy of teaching' rather than a 'theory of learning', possibly linked to their own experiences as students. It will also most likely be related to their personal preferences for presenting and receiving information. However, in most cases there may not be a specific awareness of these preferences or practices [3]. This paper a strategy to help academics, use, champion and spread the use of learning profiles as a method of understanding learning and to enhance teaching for e-learning.

The mechanism for operationalising these issues is provided by the concept of a Learning Profile (LP). Each individual has a Learning Profile [3] and we can identify three core constituents of each profile: (i) cognitive style, (ii) learning style, and (iii) personality type. This follows Jonassen and Grabowski [4] who commented that "the particular combination of aptitudes and traits possessed by each individual is reflected in the individual's cognitive styles, personality, and learning styles" (p.xi). These three profile components interact in ways which produce individual and personalised approaches to learning. Enabling and enhancing metacognition by both university teachers and students can be achieved by the process of self-reflection on learner characteristics or profiles. Learner characteristics and the related interactions with others can have a large impact on the individual learning process and, by definition, the teaching process. How individual university teachers approach their teaching and develop their teaching strategies is strongly related to their own individual learning profiles.

That academics are increasingly expected to have a 'theory of learning' is representative not only of a shift in focus in higher education, but of a series of changes throughout the sector which can be described as producing a major systems reconfiguration [5]. Within this context, and from a systems perspective, understanding how students learn can be considered to be central to designing environments to support e-learning. From the academics' perspective, this is simply one more change factor that they have to take into consideration amidst increasing student numbers, falling resource levels and changing systems.

### 3. Helping university teachers to develop a 'Theory of Learning'

The quote from Laurillard suggests that the need to adopt a 'theory of learning' is unlikely to be apparent to many. Consequently, a more difficult task is that of helping university teachers to develop a 'theory of learning' that is accessible and makes sense to each and every one. The methodology proposed in this research will enable such a theory to be developed in a constructive and applicable manner. This should be done by personalising the learning process while at the same time locating it in the context of the huge range of possible individual learning profiles.

This initial study is centred on Information Technology departments at Murdoch University, University of Technology, Sydney and Edith Cowan University, Australia. However, the program can be extended to different student constituencies. The major aims of the program are to:

- implement a strategy of developing a network of disciplinary leaders for excellence in learning and teaching in information technology;
- provide an action research model and project which will attract participants, directly impact on their professional effectiveness and increase involvement;
- enable university teachers to understand their own learning via personal learning profiles;
- extend this understanding to the range of possible learning profiles, the consequent approaches to learning and the implications for effective teaching;
- illustrate this approach with respect to information technology teaching and learning in the constituent collaborating university departments;
- create a professional development strategy for moving the action research model from a departmental to a faculty approach and thence to a university wide approach;

- create a professional development strategy for moving the action research model from an information technology subject base to other subjects; and
- enable university teachers to understand and become true Life Long Learners via interaction with their subject teaching and their students.

#### 4. Approach and methodology

The conceptual framework for the research draws on current international developments in personalised learning [6] and the recognition that these developments have their roots in “the best practices of the teaching profession” [7]. It also builds on Schön’s and Argyris’ work on the reflective practitioner [8] and learning organisations [9] and Checkland’s Soft Systems Methodology implementation of this [10]. Within this context, the concept of learning profiles [11], derived from available psychometric measures, is used to provide a framework for reflection. A process of individual reflection and peer group discussion is used as the basis for the design and development of a Personalised Teaching Resource Portal (PTRP). By using the teacher’s understanding of the learning process via self-knowledge, the core of the work is the fundamental link between learning, reflection and good teaching practice. With reference to the learning profile derivation, three instruments have been selected based on empirical evidence of their validity and reliability as measurements and constructs. As with many psychometric measures, there is continued debate about the use of each [12], [13], however, they are used as indicators of the range of styles and characteristics available in each element of the profile and indicate the self reported strengths of learning preferences rather than acting purely as quantitative measures in a quasi-experimental mode. As such they are reflective tools which the participants use as a framework to locate and consider the factors underpinning their own approaches to learning and teaching. The three instruments are:

- *Cognitive Style* – the Cognitive Styles Analysis [14] is a 15 minute computer-based test which measures personal preferences for representing and processing information.
- *Learning Style* – the Approaches to Study Inventory [15] aims to measure deep, surface and strategic approaches to learning in addition to other categories of learning.
- *Personality Type* – the Myers-Briggs Type Inventory [16] is an educational and management tool which classifies respondents according to personality type and is strongly related to measures of cognitive and learning styles.

In practical terms, the core methodology is provided by RAPAD (a Reflective And Participatory Approach to Design). RAPAD is a developmental methodology which encourages reflection within the context of a participatory approach to design. In this case it is reflection by university teachers on aspects of their own learning and participation in the process of the design and development of personalised portals. The development of the portal is a major part of the reflective and reflexive development as it requires the individual to fully engage with his or her profile in the act of applying it within the context of a design application.

The overall process for each academic starts with critically reflecting on the elements of a personal learning profile. This is first done individually and then within the context of the project team, both within and across the three universities (using a Blackboard or WebCT site designed for the purpose). The comparative group discussions help the development of an understanding of the broader range of possible learning profiles. The results of the reflections, discussions and emerging design plans should then be applied to the design and development of a PTRP by each participating academic.

The methodology uses multiple data sources and mixed data types [11]. The data sources include pre- and post-questionnaires, reflective journals, interviews and structured design commentary (i.e. a walk through of the form and content of the PTRP where the participant explains the relationship and purpose of each element in the context of his or her learning profile).

The research leaders at each of the three universities are familiar with the concepts and practices of learner profiling. Each research leader will recruit four academics who wish to participate in the research and take responsibility for them. Participating academics will undertake a process of profiling, reflection and comment, guided by the research leaders. At the outset, each participant will be asked sketch an

outline of what his/her learning profile might be. This should be done for comparative purposes and with reference to the learning profile elements (i.e. cognitive style: field dependent/independent, holistic/analytic, verbaliser/visualiser; personality type: according to MBTI type; and learning style profile: deep, surface or strategic learning style propensity).

The participants will develop a relatively straightforward web-based teaching and learning support portal. The PTRP will have teaching and learning support processes and objects embedded in the structure which are based on the learning profile of the individual developer. This will allow the participants to apply their learning in a practical context and will serve to strengthen their understanding of how the elements of their learning profile impact on various aspect of the learning process and thus the related and interconnected teaching process. A knowledge management and portal design consultant will play an important part throughout this period, being available for consultation and providing feedback and guidance on design and development issues.

The participants will be made aware of the possible range of learning profiles that exist and their impact on the learning process through discussion, comparison and locating their own profile within the set of all possible profiles. This is an iterative, dynamic and ongoing process. In the context of this research, this process will be facilitated by the provision of online discussion spaces to allow each participant to share his or her profiles and reflections with those at each of the universities involved. The online discussion spaces will be part of the research website which will also act as a regularly updated data resource. The resources should include the participant profiles; student profiles and example environments from previous studies and links to other learning resource centres. Where possible, participants will be encouraged to focus on the adaptation and reuse current resources rather than the creation of completely new resources.

The participants will develop a series of teaching strategies (e.g. a general (meta) strategy, a strategy for the academic year, for each semester, for each unit) based on the above elements of the research process. Using these resources and their reflections on and understanding of their learning profiles, the participants will work through a series of planning exercises for a set of diversely profiled students groups (e.g. large, small, lecture, seminar, tutorial) with the purpose of working out a series of approaches which they would deem suitable for the dynamic interaction of themselves and the various student groups.

The methodology of profiling and related design work will then be integrated with the units taught by the participants, allowing student involvement. The process for the students will be essentially the same. The learning profile instruments will be administered at the start of the respective units, fed back to the students for reflection and integrated with one of the unit assignments. Again, pre- and post-attitudinal surveys and a range of other data collection instruments such as semi-structured interviews will be administered to both academics and students in order to help evaluate the process and project from both perspectives. The consideration of the process from both a teacher and student perspective provides several additional features that allow a comparative analysis of the program experience.

#### **4. Formative and summative evaluation strategies**

Formative research evaluation will be undertaken to ensure the quality of the planning process, the consistency of the goals and the effectiveness of the research design. This should be achieved by undertaking an iterative review process using techniques such as external consultation, design review, expert review and one-on-one review.

Summative research evaluation will be undertaken to measure and evaluate the research aims and to provide information for future iterations. An important part of the evaluation at an individual level is provided by the use of a reflective and participative methodology (RAPAD) which provides structure, process and checkpoints for the participants. In addition, a series of pre- and post-project measures, designed to effectively evaluate the level of outcome attainment, will be used for this purpose. Both quantitative and qualitative instruments will be employed.

## 5. Conclusion

This paper has outlined a program of teaching for e-learning in the knowledge society by promoting conceptual change in academics' approaches to teaching. The mechanism for operationalising these matters is provided by the concept of student learning profiles. Each individual has a learning profile, the core constituents of each profile are cognitive style, learning style and personality type. These three profile components interact in ways which produce individual and personalised approaches to learning and e-learning. Developing an understanding of the range of possible learner profiles via accessing and reflecting on their own profile can help academics to facilitate more effective e-learning practices.

## References

- [1] P. Ramsden, *Learning to Teach in Higher Education* (Routledge, London, 1992).
- [2] D. Laurillard, A Conversational Framework for Individual Learning Applied to the 'Learning Organisation' and the 'Learning Society', *Systems Research and Behavioral Science*, **16** (1999), 113-122.
- [3] W. R. Webster, *A Reflective and Participative Approach to the Design of Personalised Learning Environments* (Lancaster University, Lancaster, Unpublished PhD Thesis, 2005).
- [4] D. H. Jonassen and B. L. Grabowski, *Handbook of Individual Differences, Learning, and Instruction* (Lawrence Erlbaum, Hillsdale, NJ, 1993).
- [5] R. Ison, Applying Systems Thinking to Higher Education. *Systems Research and Behavioral Science*, **16** (1999), 107-112.
- [6] S. E. Metros and K. Bennett, Learning Objects in Higher Education, *Educause Research Bulletin*, **19** (2002), 2-10.
- [7] DfES (Department for Education and Science), *A National Conversation about Personalised Learning* (Department for Education and Skills, Nottingham, 2004).
- [8] D. A. Schön, *The Reflective Practitioner* (Basic Books, New York, 1983).
- [9] C. Argyris and D. A. Schön, *Organizational Learning II: Theory, Method and Practice* (Addison-Wesley, Reading, Mass., 1996).
- [10] P. Checkland and J. Scholes, *Soft Systems Methodology in Action* (John Wiley, Chichester, 1990).
- [11] W. R. Webster, *A Learner-Centred Methodology for Learning Environment Design and Development*, Proceedings of Online Learning and Training 2004: Exploring Integrated Learning Environments, Brisbane, 2-3 November, 2004.
- [12] P. Geyer, Measure for Measure: Looking at an Australian Critique of the MBTI, *Australian Journal of Psychological Type*, **6(2)** (1997).
- [13] E. R. Peterson, I. J. Deary and E. J. Austin, The reliability of Riding's Cognitive Style Analysis Test, *Personality and Individual Differences*, **34** (2003), 881-891.
- [14] R. Riding and S. Rayner, *Cognitive Styles and Learning Strategies: Understanding Style Differences in Learning and Behaviour* (David Fulton Publishers, London, 1998).
- [15] H. Tait, N. J. Entwistle and V. McCune, ASSIST: a reconceptualisation of the Approaches to Studying Inventory, in: C. Rust (ed.), *Improving Student Learning* (Oxford Centre for Staff and Learning Development, Oxford, 1998), pp. 262-271.
- [16] I. B. Myers, M. H. McCaulley, N. L. Quenk and A. L. Hammer, *Manual: A Guide to the Development and Use of the Myers-Briggs Type Indicator*, 3rd ed (Consulting Psychologist Press, Palo Alto, CA, 1998).