

Faculty of Education

Implementing Innovative Technology:  
Towards the Transformation of a University

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This thesis is presented as part of the requirements for the award of the Degree of  
Doctor of Philosophy of the Curtin University of Technology

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## ***Declaration***

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I declare that this thesis is my own account of my research and has not previously been submitted for a degree from any university. To the best of my knowledge, this thesis does not contain any material written or published by another person except where duly acknowledged in the text.

Signed

Date

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Lina Pelliccione (Macchiusi) : )

## ***Abstract***

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Growing pressure is being placed upon educational institutions as students, employers and governments look at the economic, demographic and technological environments of the present, expecting them to have the answers for the future. Many institutions are turning to information and communication technology (ICT) for some of these answers. The focus of this study is two fold - the use of ICT in teaching and learning by teaching staff within an Australian tertiary institution (Curtin University of Technology) and the mechanisms the University has established in order to realign themselves with the information age. At certain stages these two coincide to provide an insight into the organisational culture and teaching environment of one Australian University. The key research questions that guided this study are as follows: How are Curtin University teaching staff utilising ICT in their teaching and learning?; What is the relationship between the ICT behaviour of a University's teaching staff and the strategies used to implement the University's ICT strategic planning initiatives?; What is an appropriate model for future implementation of ICT into teaching and learning at an Australian university?

A combination of qualitative (interview and case study techniques) and quantitative (survey and Likert-type instruments) methods was employed. Overall, this study can be described as longitudinal in nature, relying upon such tools as observation, interviews and survey instruments, to collect data at appropriate points in time from the various samples. Since it has already been acknowledged that such change takes time, the study focused specifically on those changes which occurred during the two academic years (1999-2000) at Curtin University of Technology.

It appears that the critical mass stage for integrating ICT into teaching and learning has been reached by the teaching staff involved in the Curtin survey sample. The most common teaching mode adopted by the survey sample is the traditional lecture and tutorial (workshop or laboratory) mode. However, the data revealed that over the 16 month period of the study there was a large increase in the use of Web-based material for teaching and learning.

The data revealed that a number of factors emerged which affected the adoption of ICT. These factors included: leadership across the university, attitude toward the use of ICT; the perceived benefits of adopting ICT in teaching and learning; incentives, modeling mechanisms, the provision of adequate support structures; the time factor; training; facilities and resources. The reflective monitoring system utilised in this study (the TracIT reports) revealed the changes in ICT behaviour and the changes in the ICT environment, as well as the source of initiation of the change. It appears that most of the ‘real changes’ which occurred in the teaching practice of the case study sample were individually driven, with some others being influenced by their own Department/School or by student pressure. The study also found that the adoption of ICT into the working environment of a university teacher significantly increases the workload of individual staff. The existence of transformational leadership across all levels of the University was identified as a major factor in the promotion and adoption of ICT and ultimately in the development of a truly professional learning community.

From the extensive data collected in this longitudinal study an empirical model or framework, the “Curtin University Professional Learning Community Model”, was introduced. Many of the teaching staff at Curtin University involved in this particular study have clearly demonstrated their commitment to the adoption of ICT for teaching and learning. The detailed case study data has also revealed that many of the teaching staff possess professional attributes which would be admired and valued in any university.

Universities are facing the challenge of identifying what role ICT will play in the future of higher education and how to implement the appropriate strategies which will meet these needs. This study has found that the key to meeting the challenge seems to be to harness strategies that lead to the development of a professional learning community. The Curtin University Professional Learning Community Model has identified the key elements which need to be in place if the use of ICT for teaching and learning is to be not only adopted, but sustained and more importantly, effective in the teaching and learning process. This study has clearly revealed that it is only through the synergy of university commitment and individual commitment that real change can actually take place, the change in this case being the adoption of ICT in teaching and learning practices. The strategies suggested by the empirically derived model can begin this journey to a truly professional learning community.

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